Letter Report

# Annual Data Report for Geochemical, Isotopic, and Biological Monitoring for East Central and Southeastern Nevada

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Submitted to

Southern Nevada Water Authority

November 2006

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## EXECUTIVE SUMMARY

In November 2003, the Desert Research Institute began a multiyear program to collect data for recharge areas lacking data and to provide time series data for the White River and Meadow Valley Wash flow systems. This effort was undertaken to improve the isotope mass-balance water budget model of Thomas *et al.* (2001) and to provide information on variability (uncertainty) of stable isotopic data (deuterium and oxygen-18) used in the mass-balance water budget model. This multiyear program was established to collect isotopic and geochemical data in areas with little or no data, establish high-altitude monitoring sites that would provide time-series data in recharge areas, and collect baseline water temperature, isotopic, and water chemistry data for large regional springs within the study area. Additionally, biological assessments were performed at the high-altitude monitoring sites to provide baseline data on macroinvertebrate communities, including population density, community structure, and species richness. This data report presents the data collected for this program through May 2006.

High-altitude monitoring sites were established in the following mountainous recharge areas: White Pine Range, Egan Range, central Schell Creek Range, southern Schell Creek Range, Wilson Creek Range, and Delamar Mountains. In 2005, the Delamar Mountains monitoring site was destroyed by flooding, so the site was moved to the nearby Meadow Valley Mountains. At the monitoring sites, spring flow, specific conductance, and water temperature were measured continuously. On a quarterly basis, field parameters (water temperature, pH, specific conductance, and dissolved oxygen) were measured and water samples were collected for isotopic and water chemistry analyses. At the high-altitude monitoring sites, precipitation amounts were measured quarterly in storage gages and precipitation intensity was measured for every storm. Additionally, precipitation samples were collected quarterly from storage gages for isotopic analyses.

Regional spring monitoring sites were established at 12 large discharging valley springs. These springs are located in Meadow, Moapa, Pahranagat, Snake, Spring, and White River valleys. On a quarterly basis at all of the regional spring monitoring sites, field parameters (water temperature, pH, specific conductance, and dissolved oxygen) were measured and water samples were collected for major ion chemistry and isotopic analyses. At eight of the regional spring monitoring sites, temperature recorders were installed to provide continuous water temperature measurements.

To improve the isotope mass-balance water budget model, spatial isotopic and chemical data were collected for springs in mountainous recharge areas throughout the White River and Meadow Valley Wash flow systems. Additionally, some recharge area springs that had been previously sampled were resampled to evaluate seasonal and yearly variability. Because of increased interest in the water resources of Snake and Spring valleys, spring sampling was also conducted in the Snake and central Schell Creek ranges and a high-altitude monitoring site was established in the northern Schell Creek Range.

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## INTRODUCTION

This report presents data collected by the Desert Research Institute (DRI) for an ongoing research project with the Southern Nevada Water Authority (SNWA). The goals of the research project are to collect geochemical, isotopic, and biological data for: (1) water budget evaluation of the White River and Meadow Valley Wash regional groundwater flow systems; (2) identification of recharge sources and potential interbasin flow in Spring and Snake valleys; and (3) identification and documentation of the biodiversity of the aquatic organisms living in the recharge area monitoring springs. The data presented in this report include data collected through May 2006, as well as data collected in 2004 and 2005 that were previously reported in Thomas et al. (2004; 2005).

## PROJECT BACKGROUND

The following summarizes activities conducted during the first three years of this project:

1. Data were collected from springs in recharge areas throughout the White River and Meadow Valley Wash regional flow systems from October 2003 to November 2006 (Figure 1). These data will be used to improve the isotope mass-balance water budget of Thomas et al. (2001).
2. Six long-term monitoring sites were established in recharge areas. Site installation began with WR-1 in the White Pine Range in October 2003 and concluded with WR-6 in the Schell Creek Range in July 2004. One recharge area monitoring site in the Delamar Mountains (WR-4, Upper Riggs Spring) was obliterated during flooding in 2005, and it was moved to the nearby Meadow Valley Mountains (WR-7, Grapevine Spring) on May 19, 2005. The main purpose of the monitoring sites is to determine long-term variability of chemical, isotopic, and physical characteristics of recharge area springs in the mountain block.
3. In January 2004, quarterly sampling of three regional springs in the Muddy River Spring area was initiated. Regional spring sampling was expanded in November 2004 to include a total of 11 regional warm springs throughout east-central and southeastern Nevada. In addition to the collection of water samples on a quarterly basis, continuous water temperature monitors were installed in eight of the regional warm springs. Data collected at the regional springs will be used to determine long-term variability of chemical, isotopic, and physical characteristics.
4. In May 2005, data collection for recharge area springs was expanded to include mountains that supply recharge to Long, Butte, Spring, and Snake valleys (Figure 1). This data collection was added to the project due to the lack of geochemical data in this area.

## METHODS

Data collected at springs include measurement of field parameters, determining coordinates of the spring, and the collection of water samples for major ion analyses, and stable isotopes of oxygen and hydrogen. Location was determined with a Garman Map76CS. Measurements of field parameters include pH, water temperature, electrical conductivity, and dissolved oxygen. All instruments were calibrated according to the manufacturer's

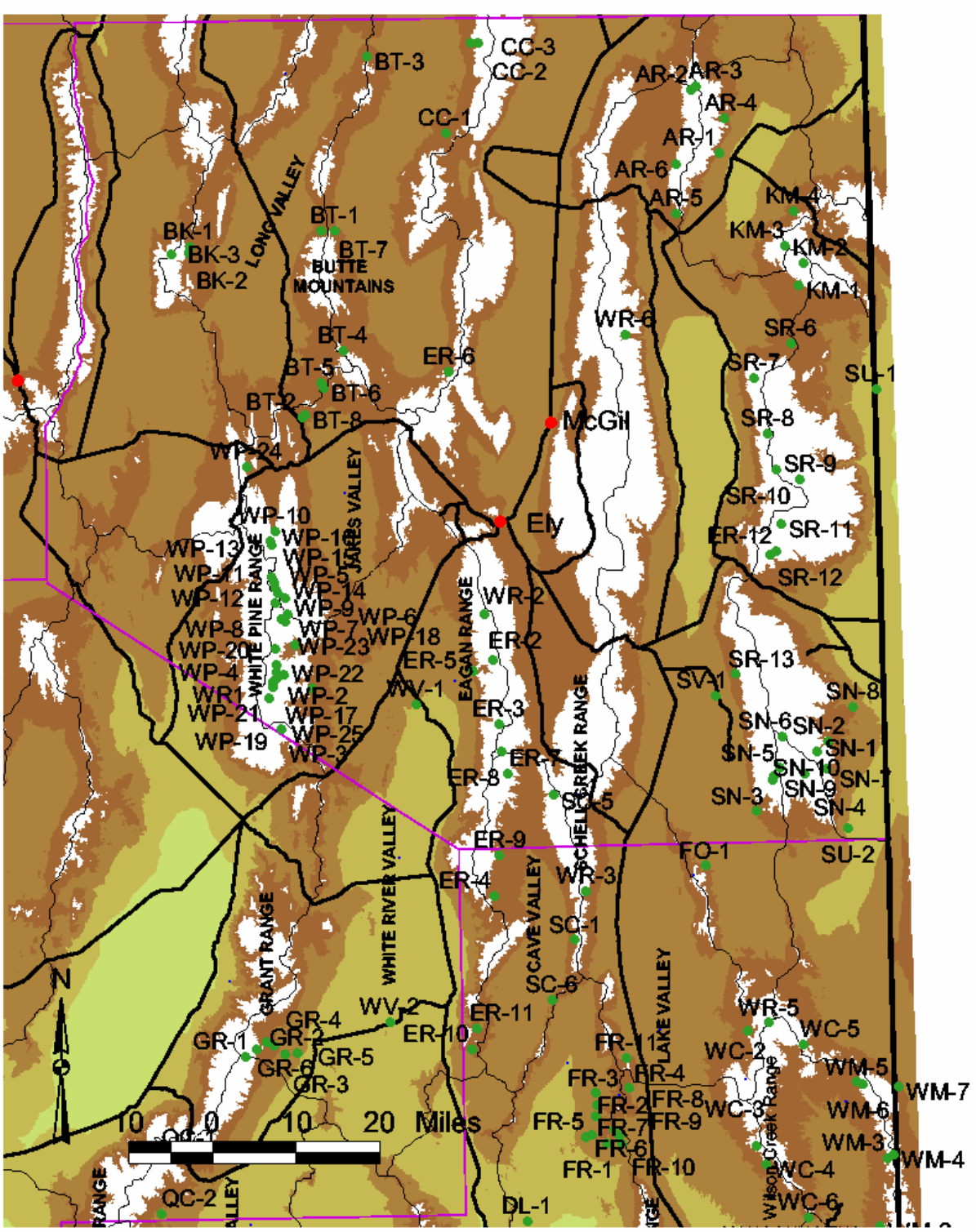


Figure 1a. Sample sites in east-central Nevada, including the northern White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys. Site numbers are from Appendix A.

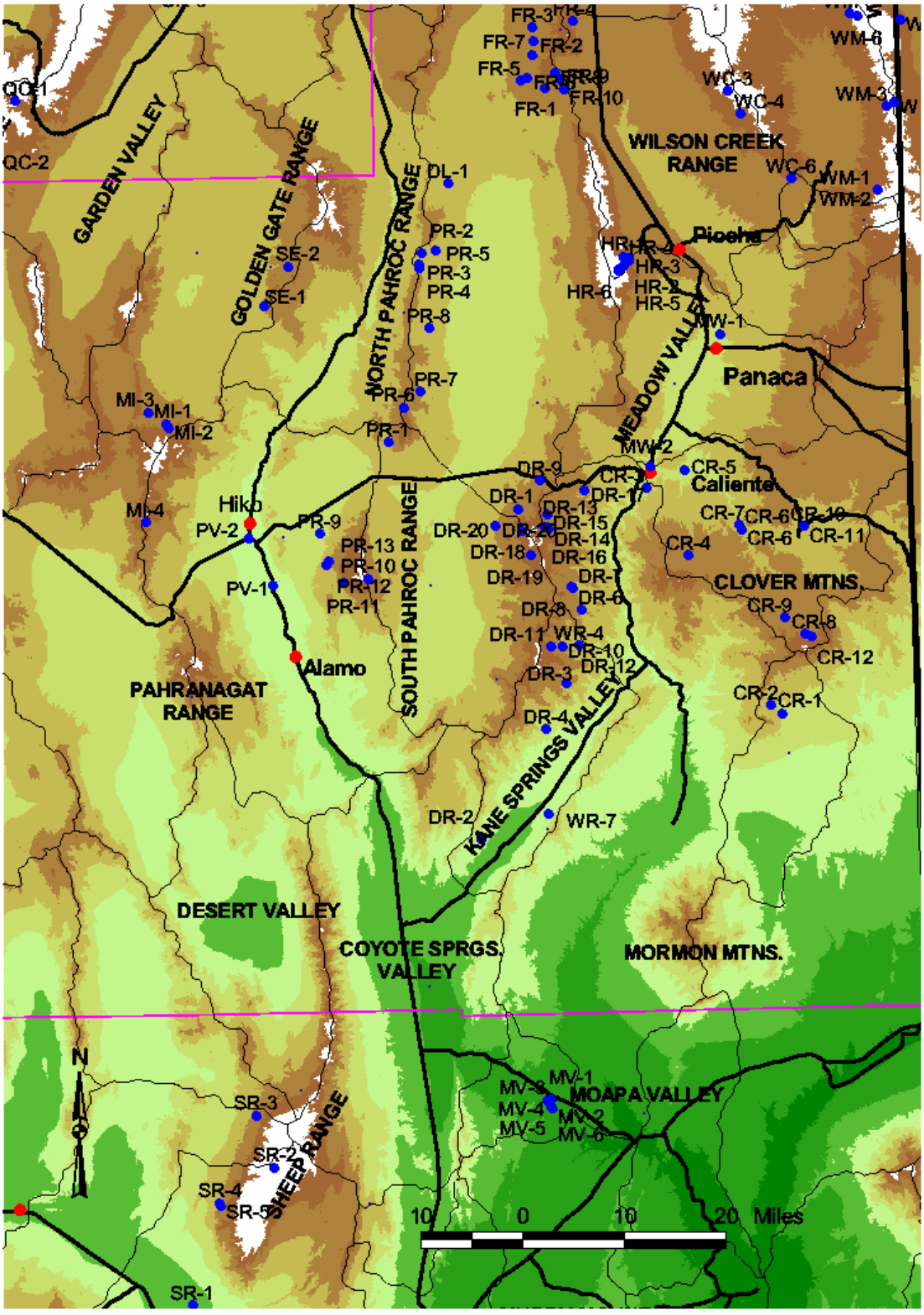


Figure 1b. Sample sites in the central and southern White River and Meadow Valley Wash regional groundwater flow systems. Site numbers are from Appendix A.

calibration procedures. Dissolved oxygen was measured with a YSI 550A dissolved oxygen meter, pH and water temperature were measured with a Beckman 225 pH meter, and electrical conductivity was measured with a Orion model 130A electrical conductivity meter.

Water samples for major ion analyses were filtered through a 0.45 micron filter into 2-500 ml polyethylene bottles, then delivered to the Desert Research Institute's Analytical Chemistry Laboratory for analysis of major ions (calcium, magnesium, sodium, potassium, alkalinity [bicarbonate and carbonate], chloride, $SiO_2$, and sulfate). In June 2004, bromide and fluoride analyses were added to the chemical suite. Samples for stable isotopes (deuterium [δD] and oxygen-18 [$\delta^{18}O$]) were collected in 16 ml clear glass vials with polyseal lined lids. These samples were delivered to the Stable Isotope Laboratory at the University of Nevada, Reno. These data are presented in Appendices A (recharge area springs) and C (regional springs). Methods for major ion analyses are presented in Appendix F, and methods for determining the stable isotopic composition of water is presented in Appendix G.

At the six recharge area monitoring sites, field parameters were measured and water samples were collected on a quarterly basis (Appendix A). Additionally, continuous monitoring equipment was installed at the springs to measure precipitation, spring discharge (flow), water temperature, and electrical conductivity. The monitoring sites consist of an H-flume to determine volumetric discharge from the measured stage height, a storage type precipitation gage to provide samples of precipitation and a secondary precipitation measurement, a Campbell Scientific CR10X datalogger to measure and record the electronic sensors which include a Texas Electronics TE525WS tipping bucket rain gage with a snowfall adapter, a Campbelll Scientific CS 547A conductivity/temperature sensor, and a Druck PDCR 1830 1 psig pressure transducer or a Campbell Scientific CS408 Pressure Systems 500 SDI-12 pressure transducer to measure stage height in the H-flume. Electronic sensors are measured every five minutes with the average values saved every hour. Plots of the discharge, electrical conductivity, water temperature, and precipitation are shown in Figures 2 through 8.

At the 11 regional spring monitoring sites field parameters were measured and water samples were collected on a quarterly basis. At eight of the regional springs sites, Onset Water Temp Pro temperature data loggers were installed in the springs to determine long-term variability of water temperature.

## INSTALLATION OF MONITORING SITES AND SITE DESCRIPTIONS

### Recharge Area Springs

The recharge area monitoring site in the White Pine Range (White River 1 [WR-1]) was installed October 27, 2003, at an elevation of 8,066 feet. This unnamed spring is the source of the White River. It discharges out of carbonate rock. In late fall 2004, the transducer wire used to determine the volumetric discharge was cut by a rodent. This problem was not discovered until spring 2005 when the snow at the site had melted. At this time, spring flow had increased beyond the capacity of the H-flume. A new sensor was installed upstream of the H-flume where discharge was determined by the area-velocity method. A rating curve was constructed to obtain an estimate of discharge during the recession of the anomalously high spring flow. Appendix C presents the data used to construct the rating curves for WR-1 and WR-6. On November 17, 2005, a new

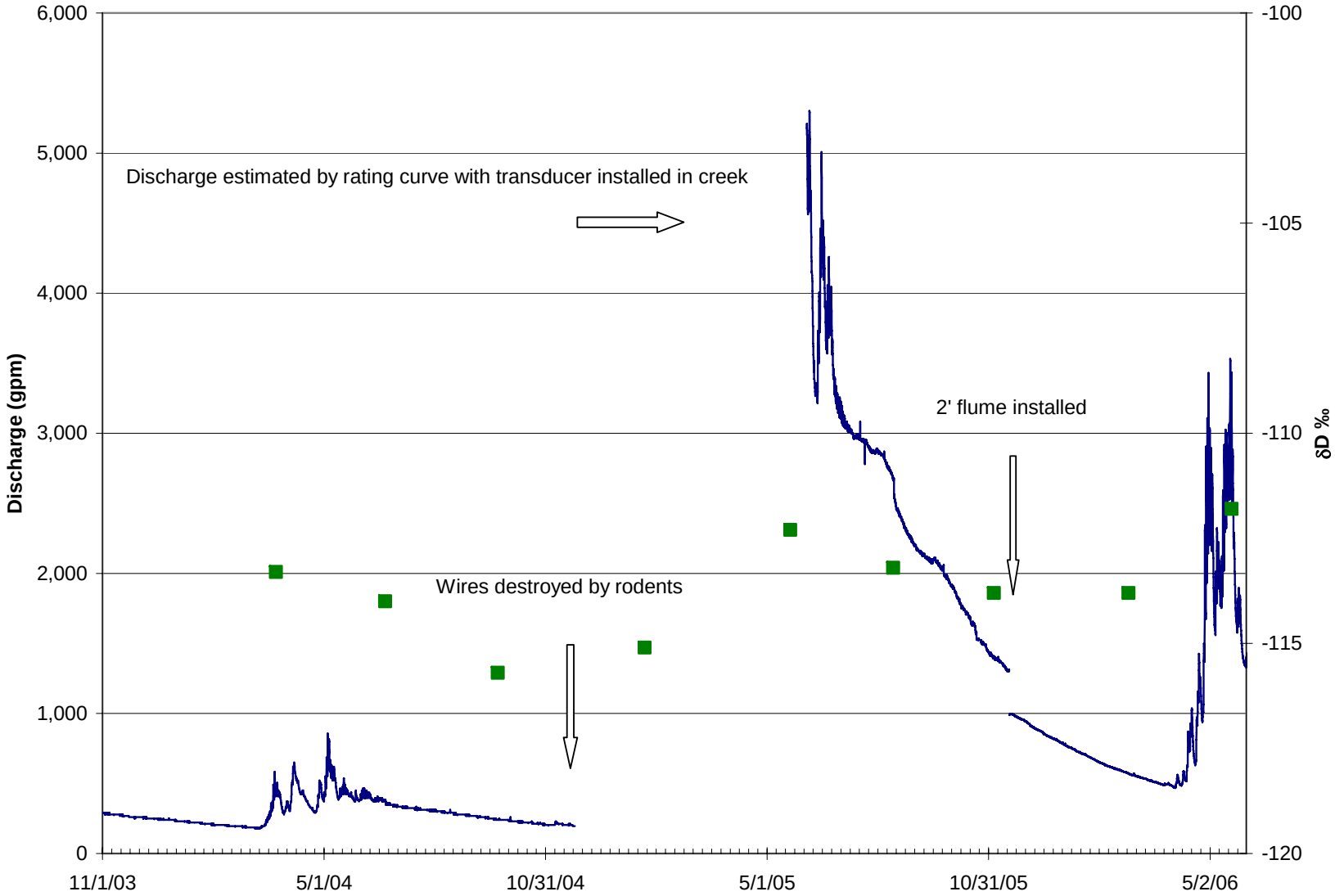


Figure 2a. Spring flow at monitoring spring WR-1 in the White Pine Range. Deuterium concentrations from quarterly sampling are indicated by green squares.

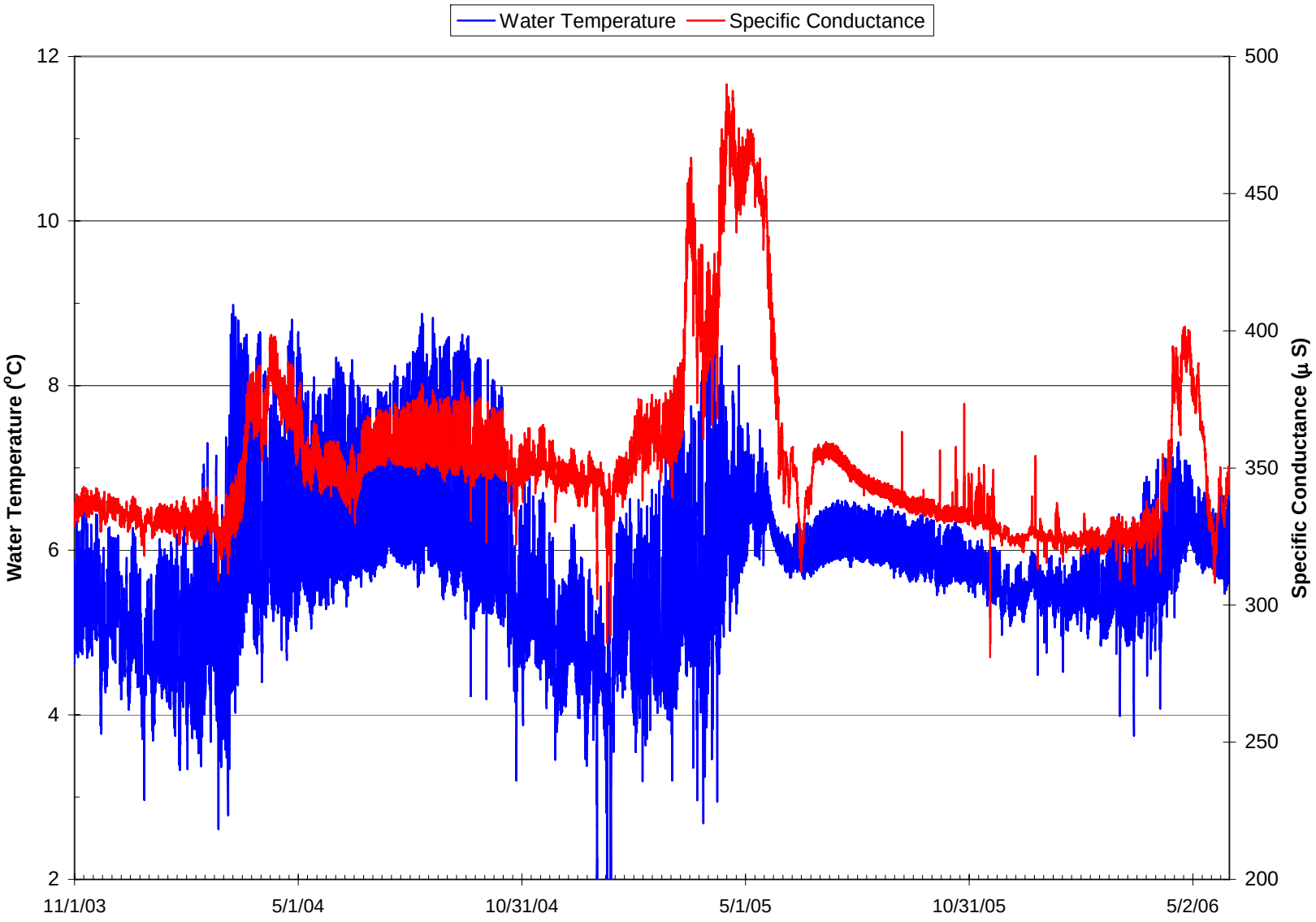


Figure 2b. Water temperature and specific conductance at monitoring spring WR-1 in the White Pine Range.

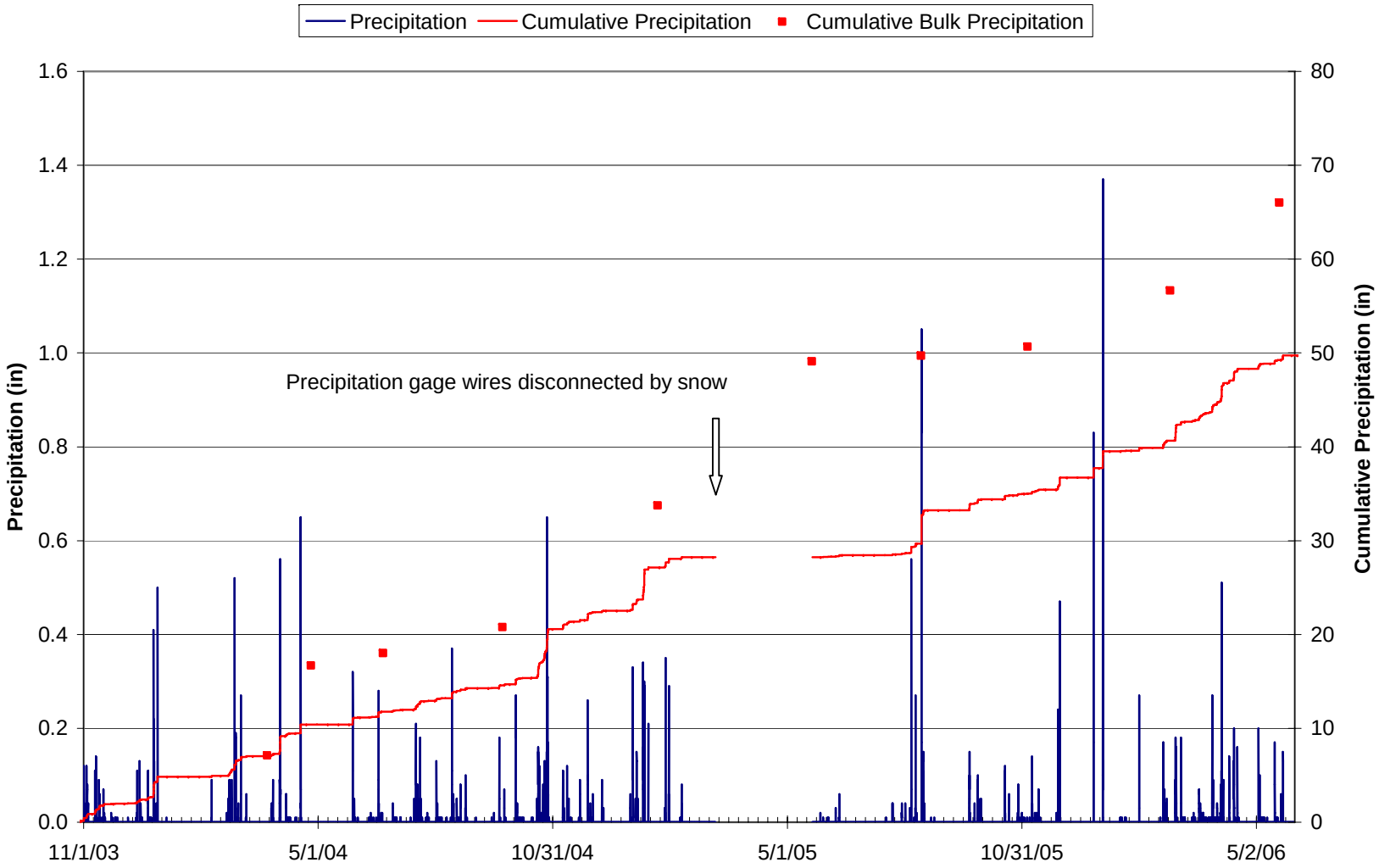


Figure 2c. Precipitation at monitoring spring WR-1 in the White Pine Range. Red squares indicate the volume of precipitation measured in the bulk precipitation gages (the tipping bucket total precipitation was not adjusted for the period of missing record).

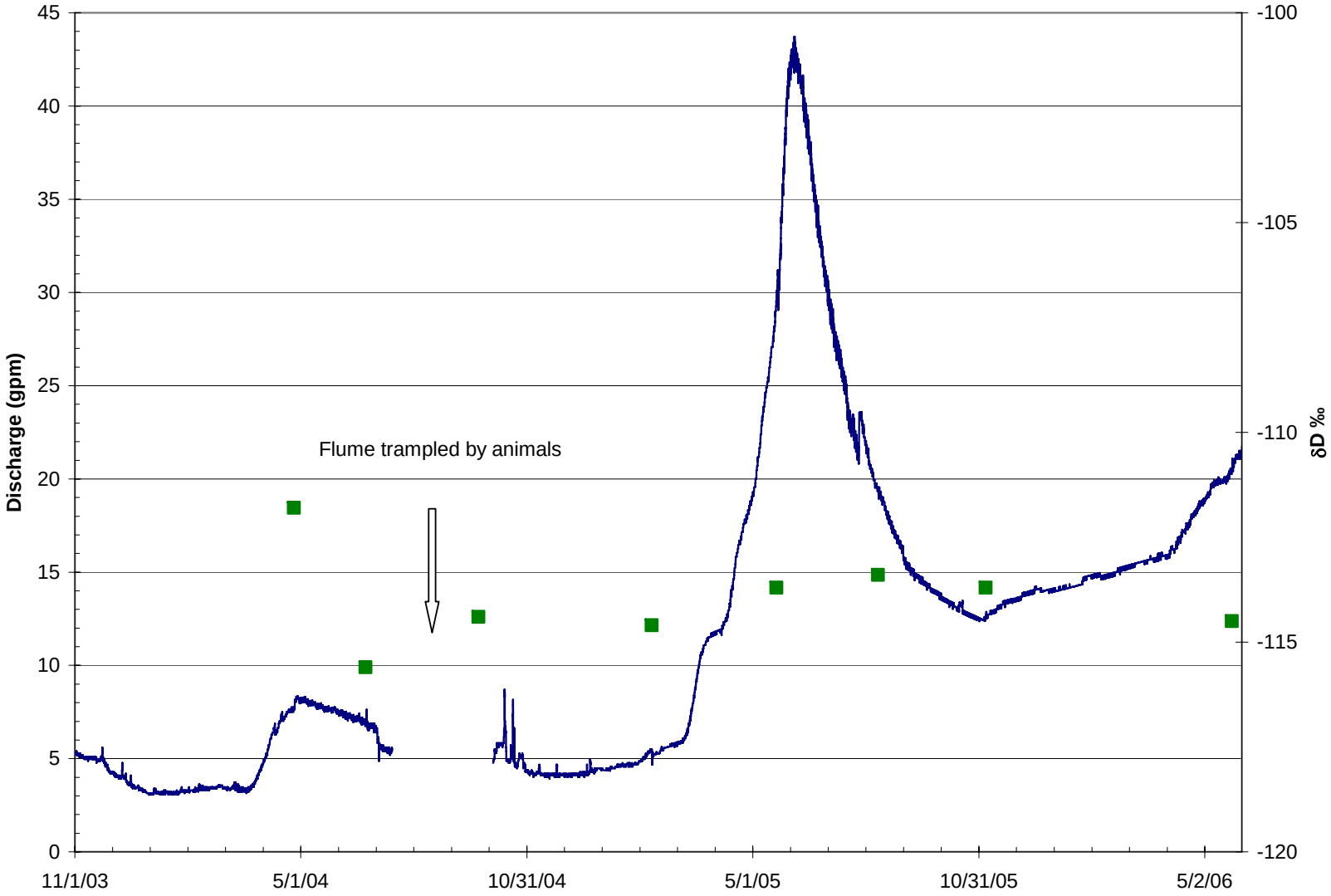


Figure 3a. Spring flow at the Upper Terrace monitoring spring WR-2 in the central Egan Range. Deuterium concentrations from quarterly sampling are indicated by green squares.

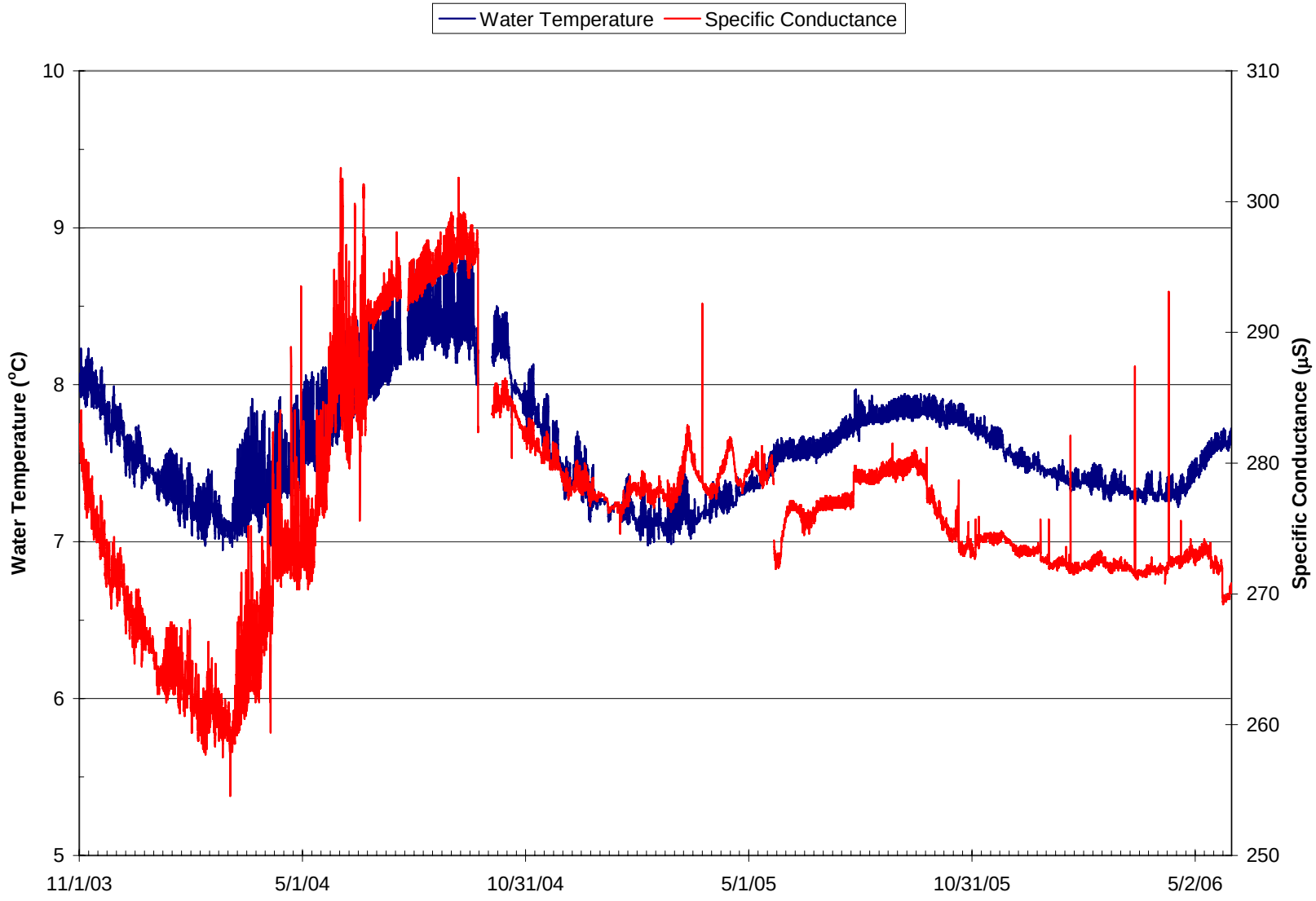


Figure 3b. Water temperature and specific conductance at the Upper Terrace monitoring spring WR-2 in the central Egan Range.

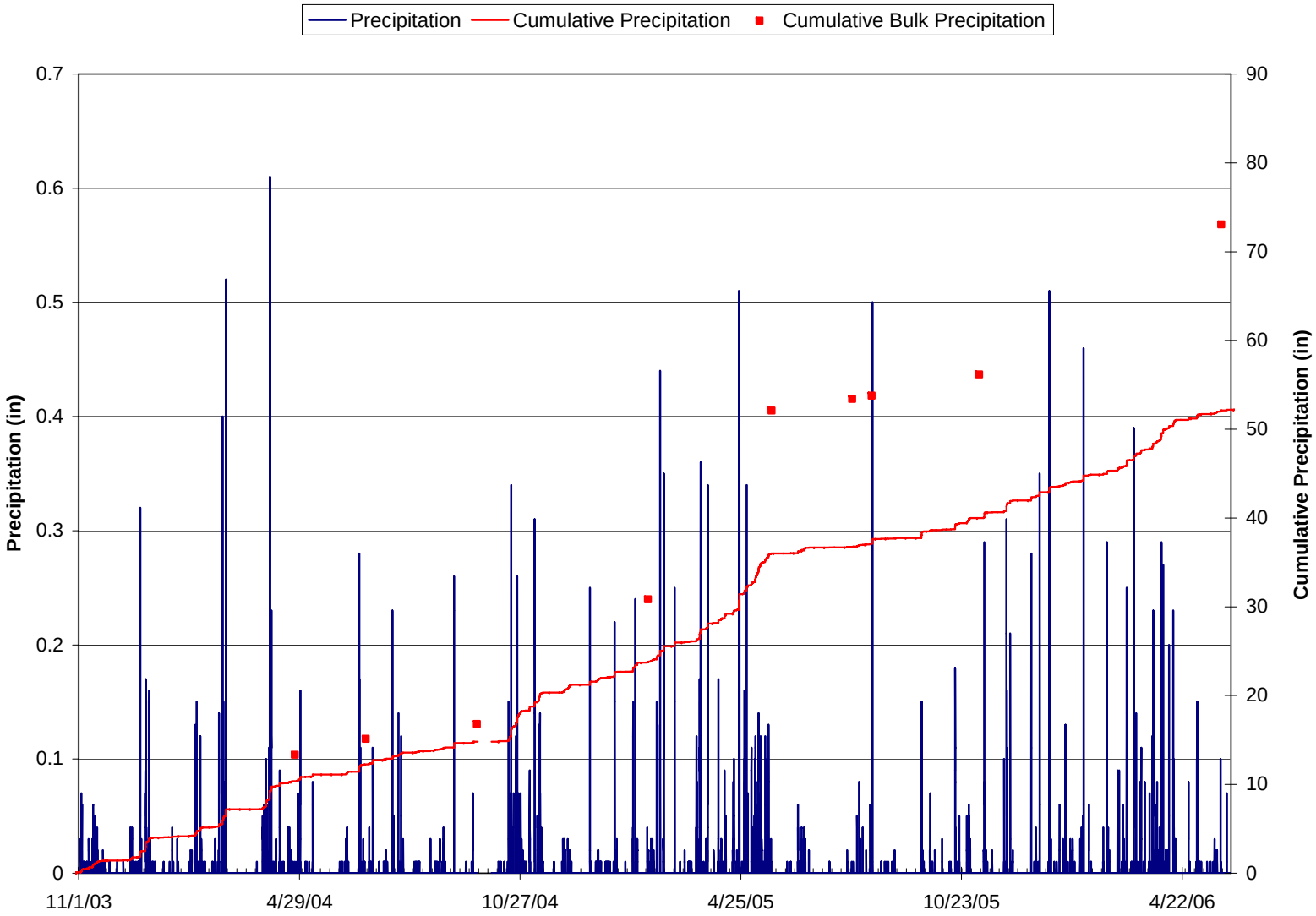


Figure 3c. Precipitation at the Upper Terrace monitoring spring WR-2 in the central Egan Range. Red squares indicate the volume of precipitation measured in the bulk precipitation gage.

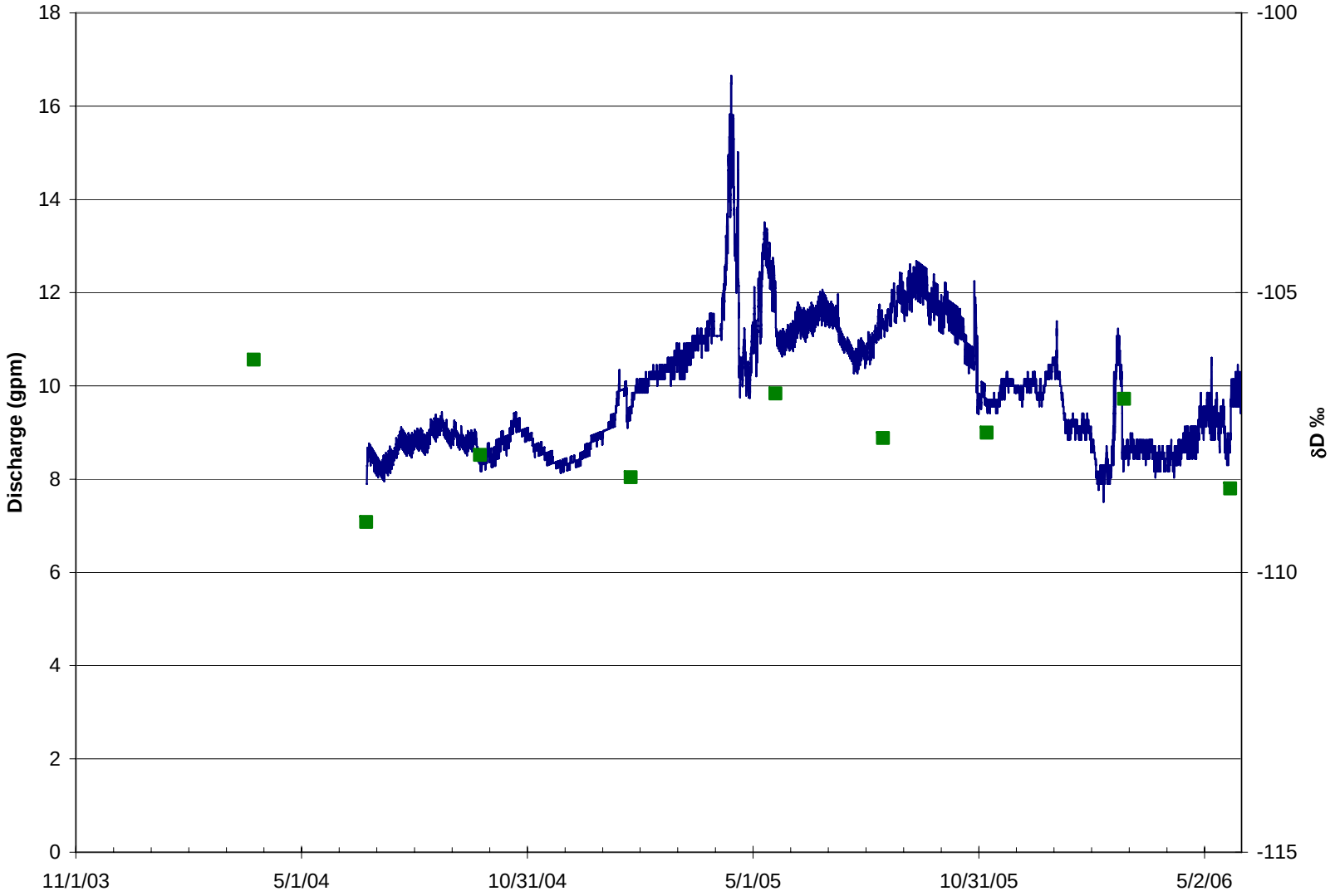


Figure 4a. Spring flow at the Patterson Pass monitoring spring WR-3 in the Schell Creek Range. Deuterium concentrations from quarterly sampling are indicated by green squares.

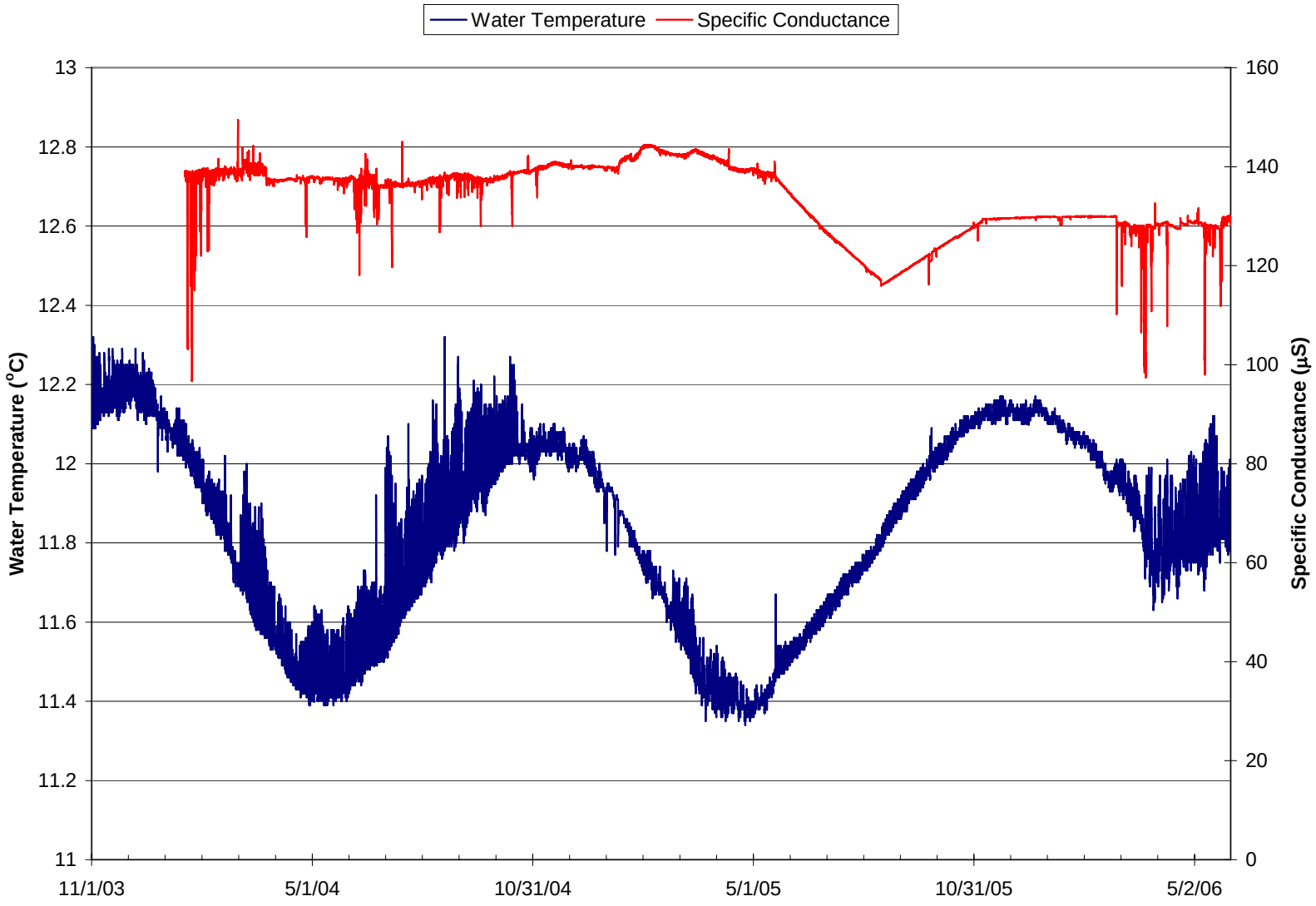


Figure 4b. Water temperature and specific conductance at the Patterson Pass monitoring spring WR-3 in the Schell Creek Range.

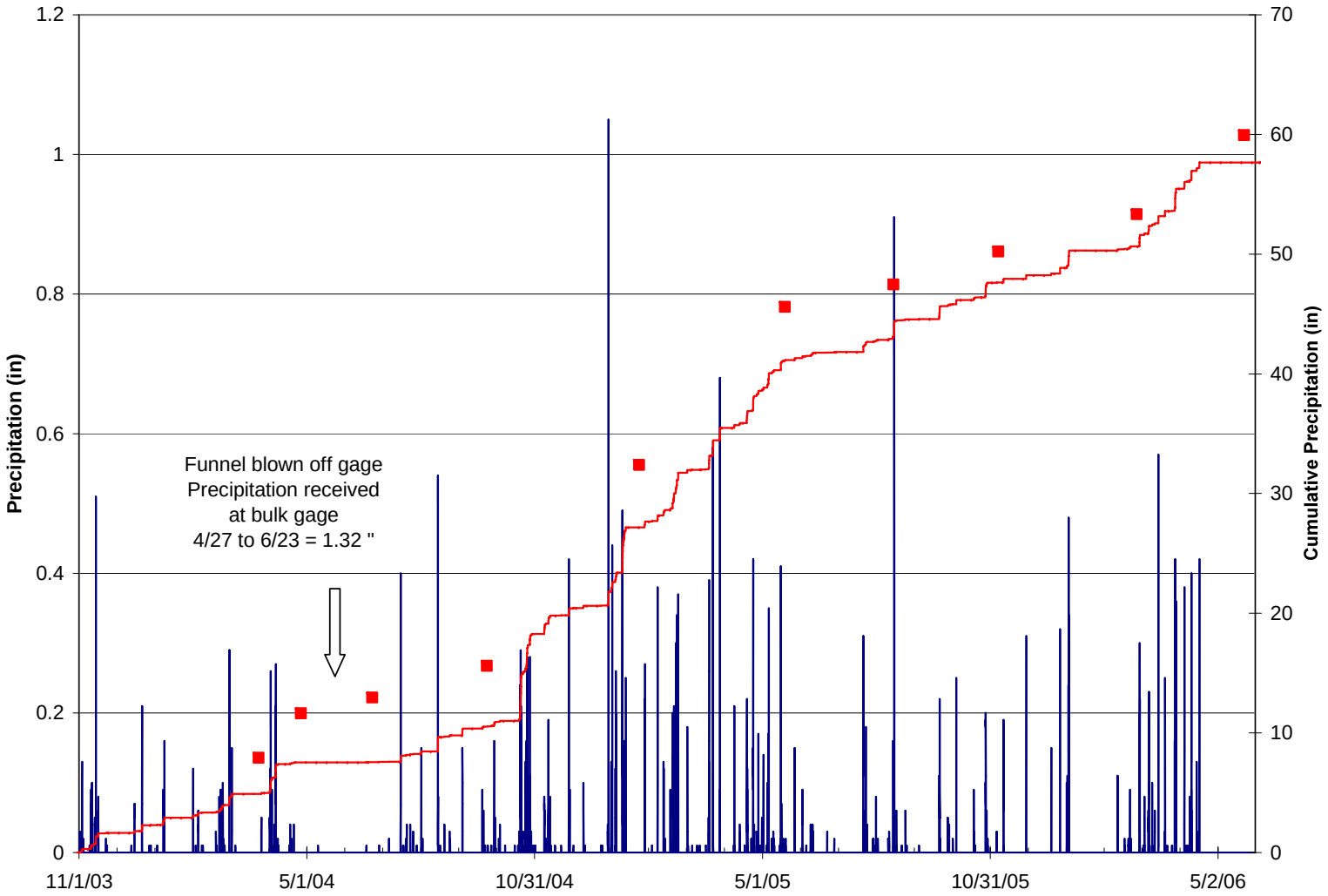


Figure 4c. Precipitation at the Patterson Pass monitoring spring WR-3 in the Schell Creek Range. Note that total precipitation for the period 4/27/2004 to 6/23/2004 was 1.32 inches as measured in the adjacent storage precipitation collector. Red squares indicate the volume of precipitation measured in the bulk precipitation gages.

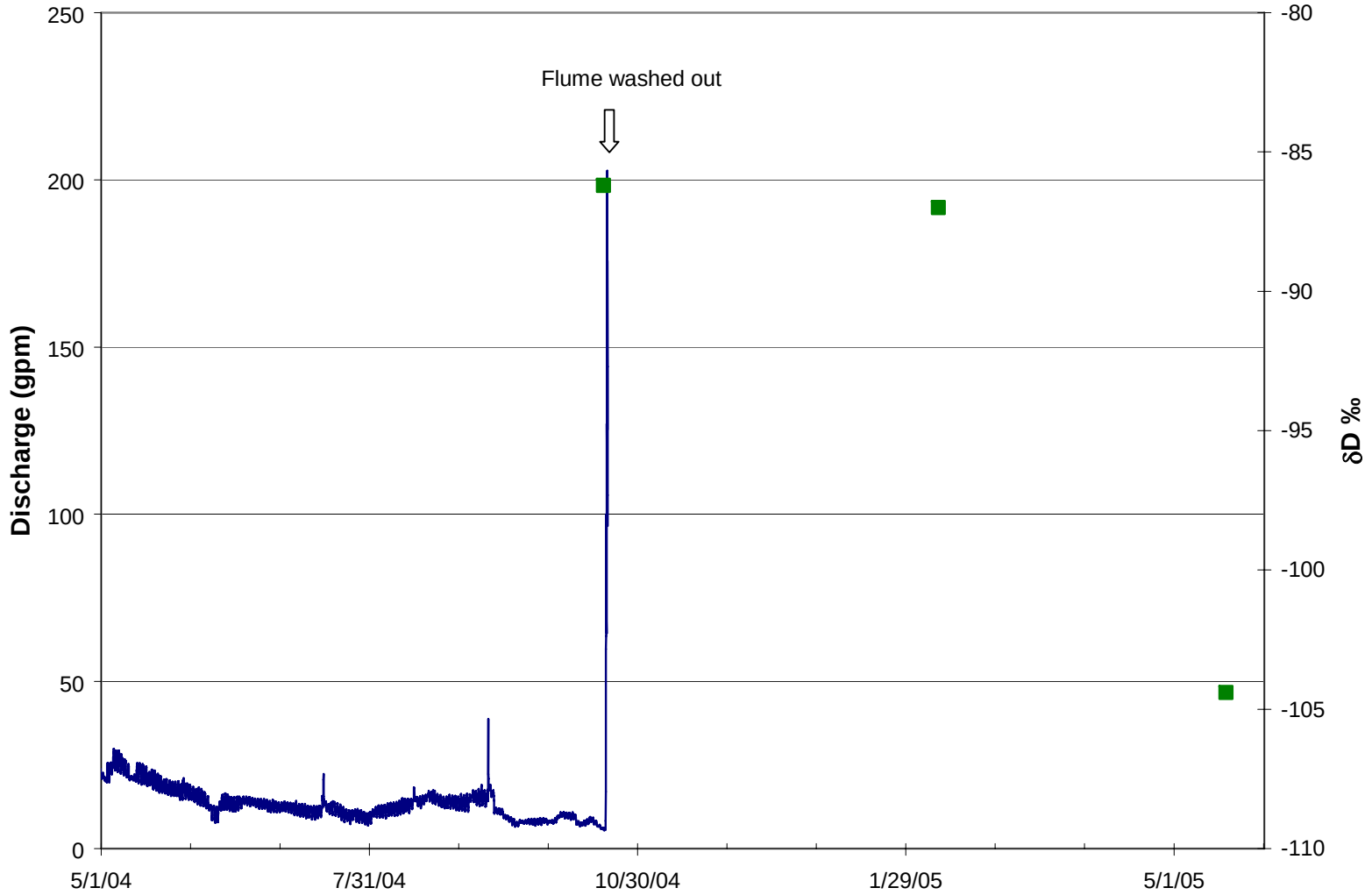


Figure 5a. Spring flow at the Upper Riggs monitoring spring WR-4 in the Delamar Range. Deuterium concentrations from quarterly sampling are indicated by green squares.

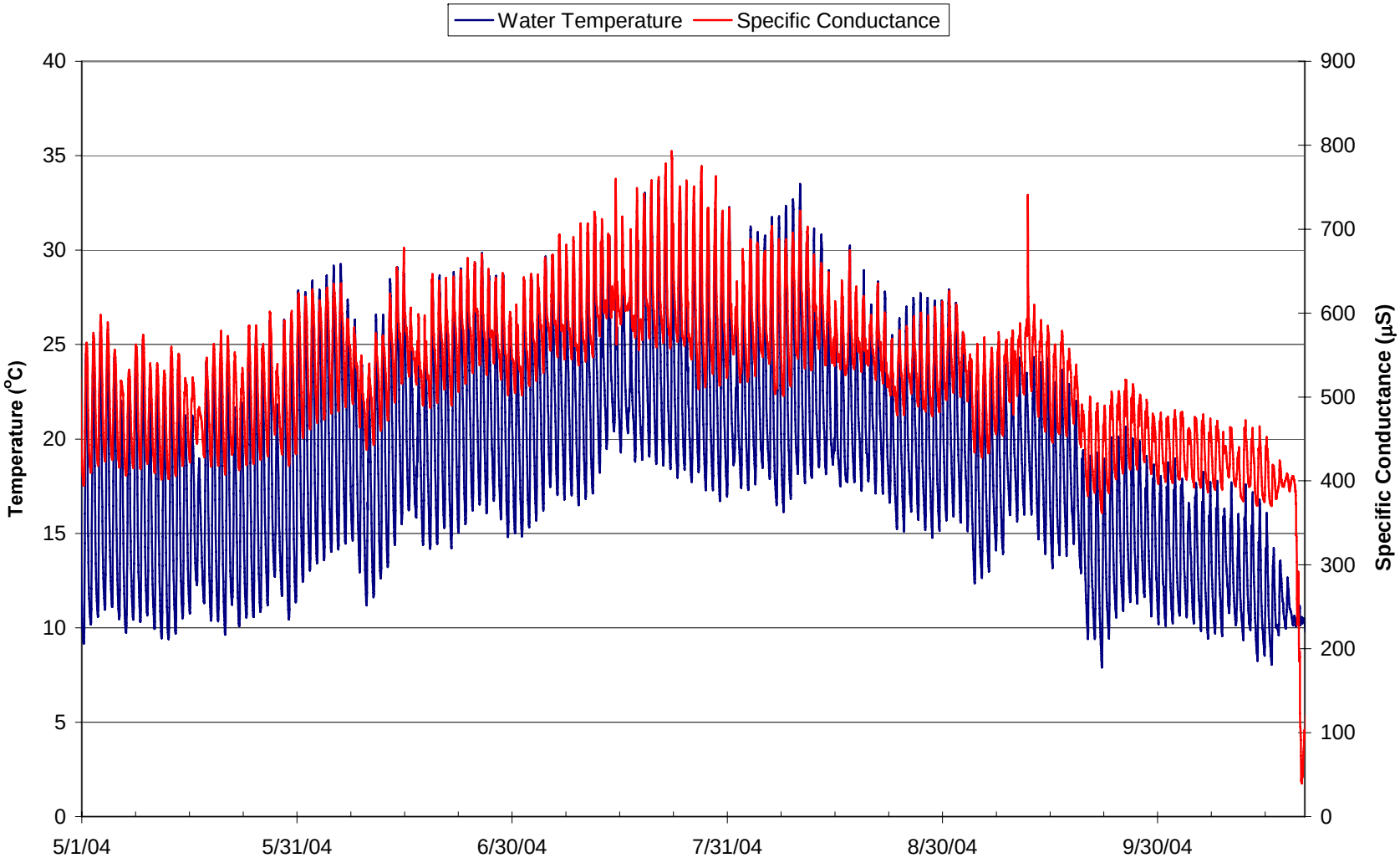


Figure 5b. Water temperature and specific conductance at the Upper Riggs monitoring spring WR-4 in the Delamar Range.

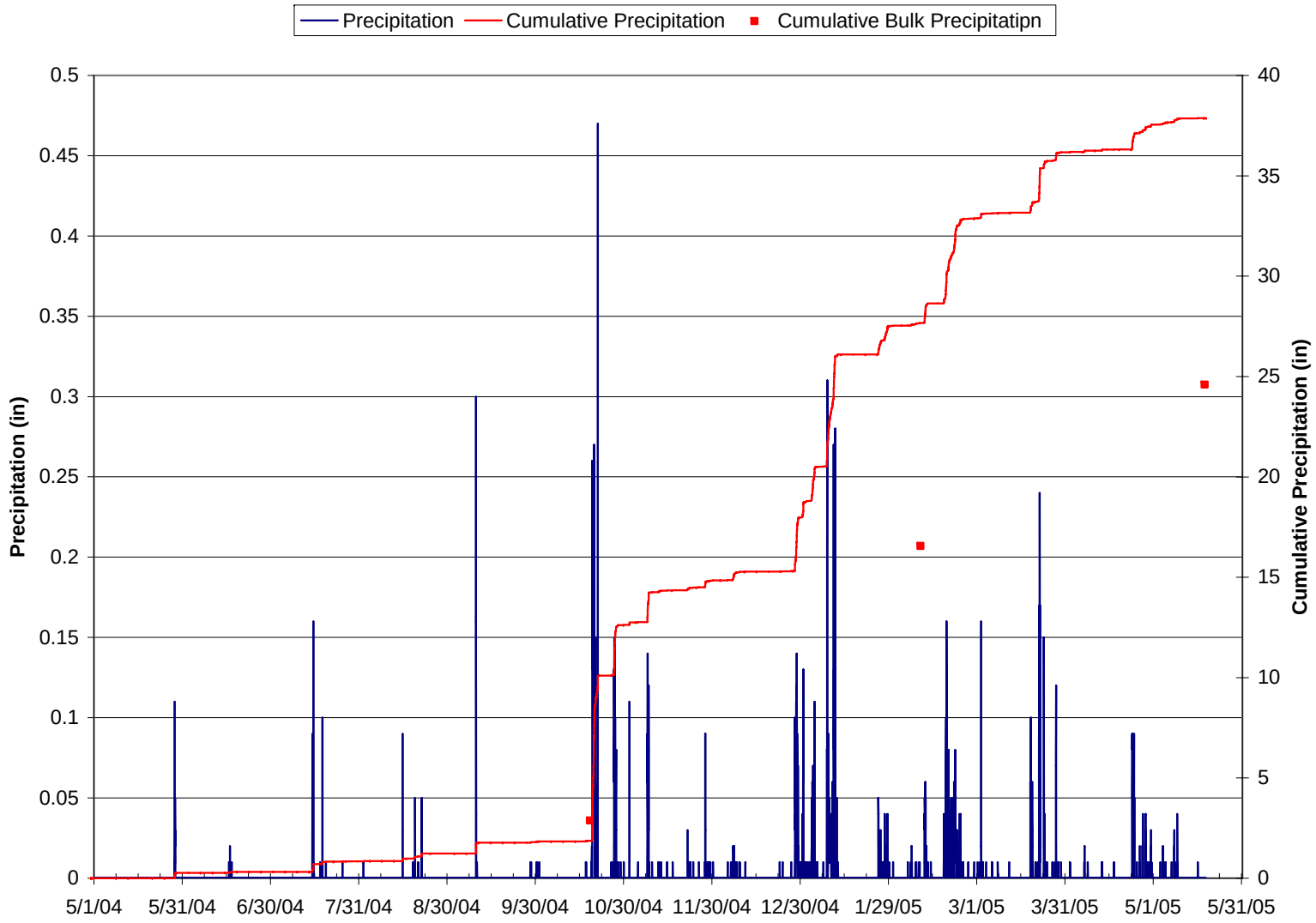


Figure 5c. Precipitation at the Upper Riggs monitoring spring WR-4 in the Delamar Range. Red squares indicate the volume of precipitation measured in the bulk precipitation gages.

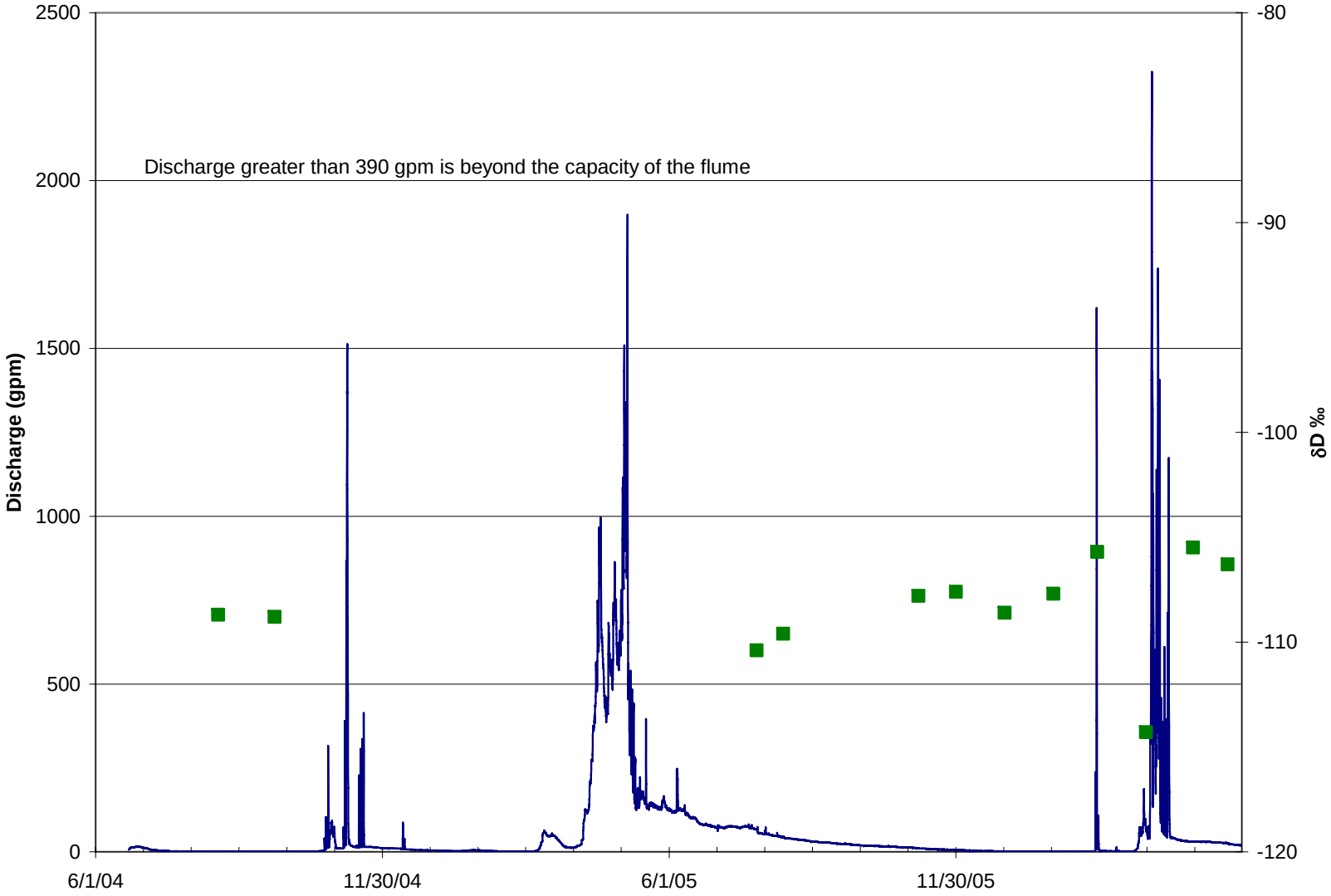


Figure 6a. Spring flow at Headwaters spring WR-5 in the Wilson Creek Range. Deuterium concentrations are indicated by green squares.

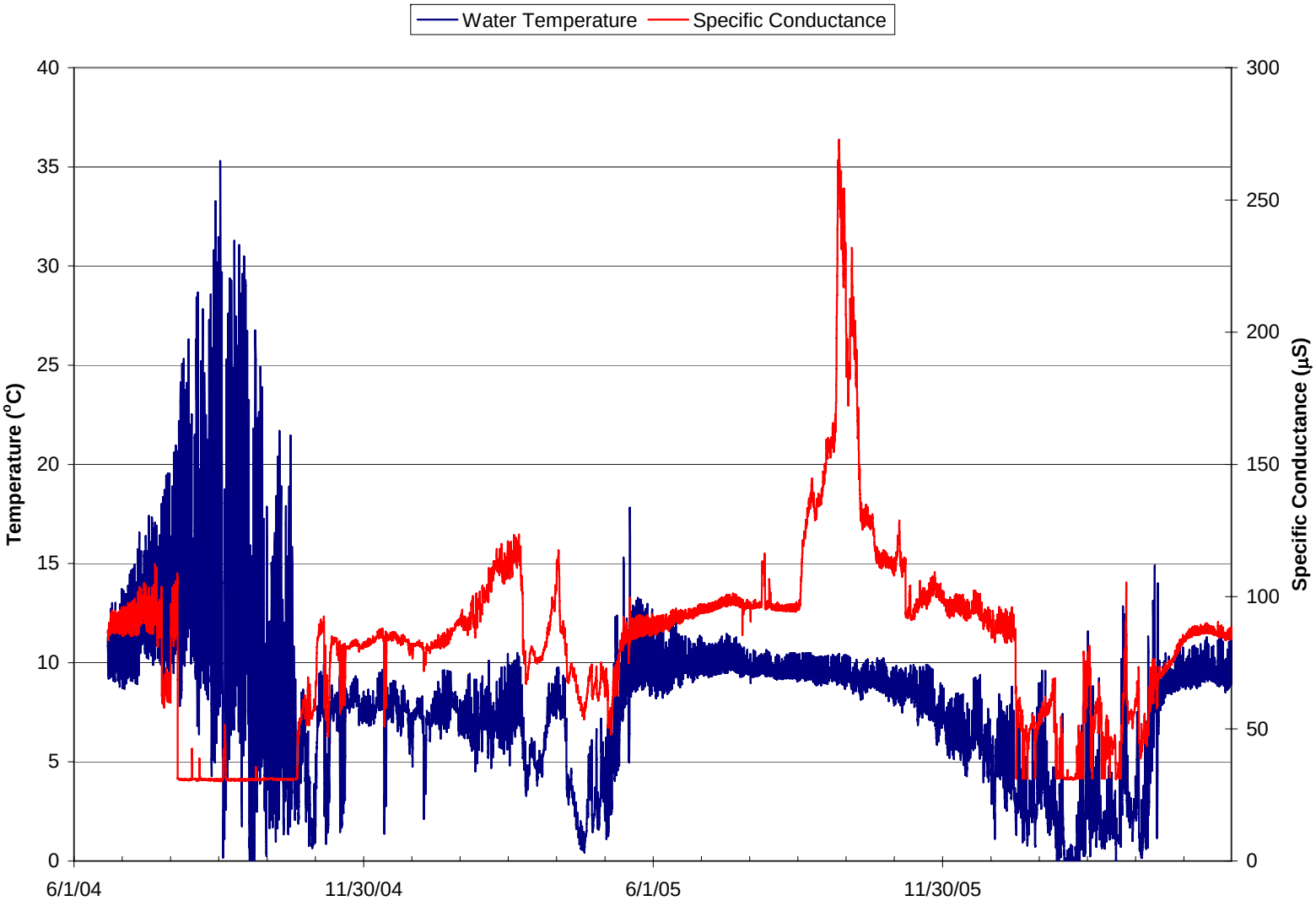


Figure 6b. Water temperature and specific conductance at the Headwaters spring WR-5 in the Wilson Creek Range.

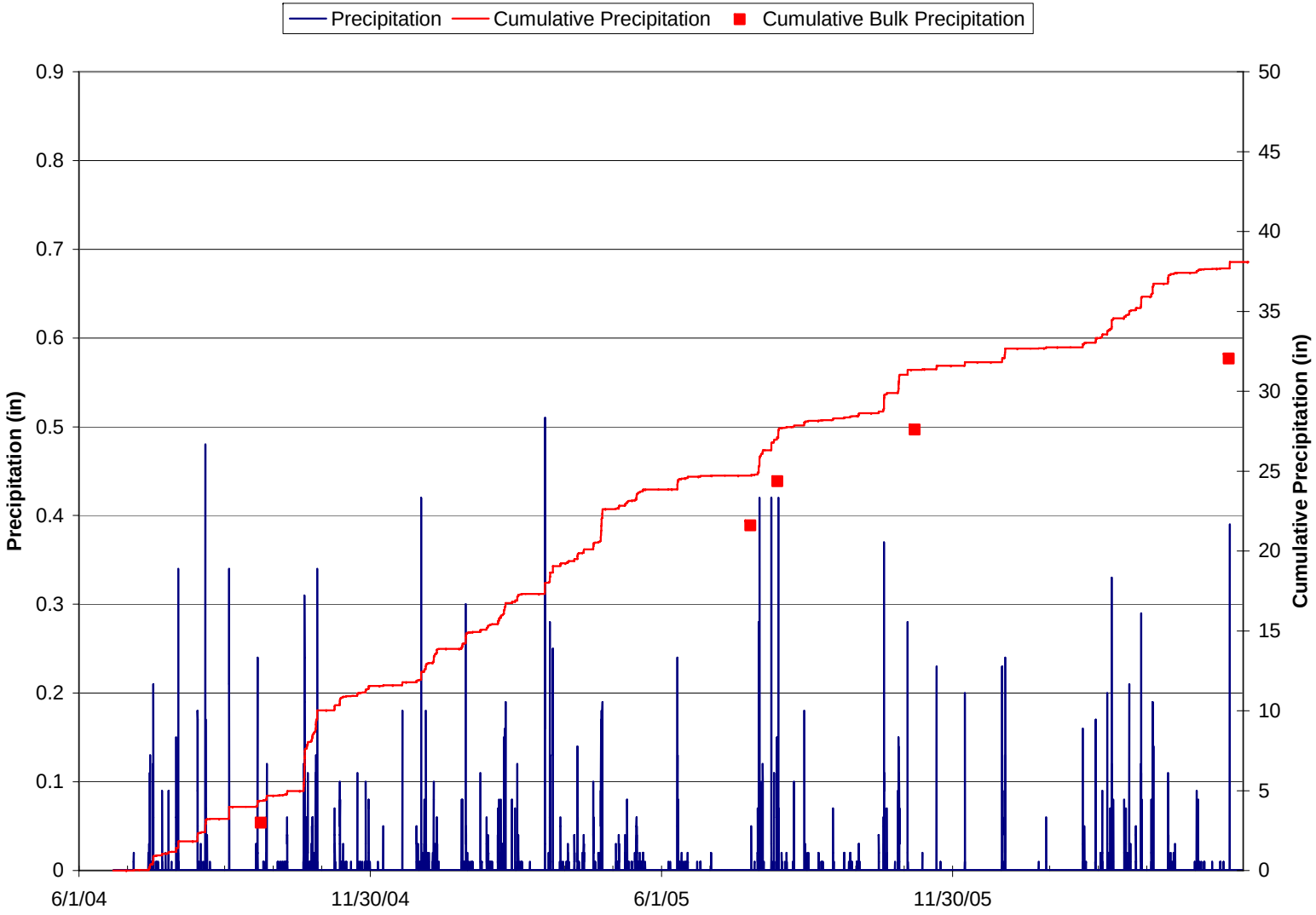


Figure 6c. Precipitation at the Headwaters spring WR-5 in the Wilson Creek Range. Red squares indicate the volume of precipitation measured in the bulk precipitation gages.

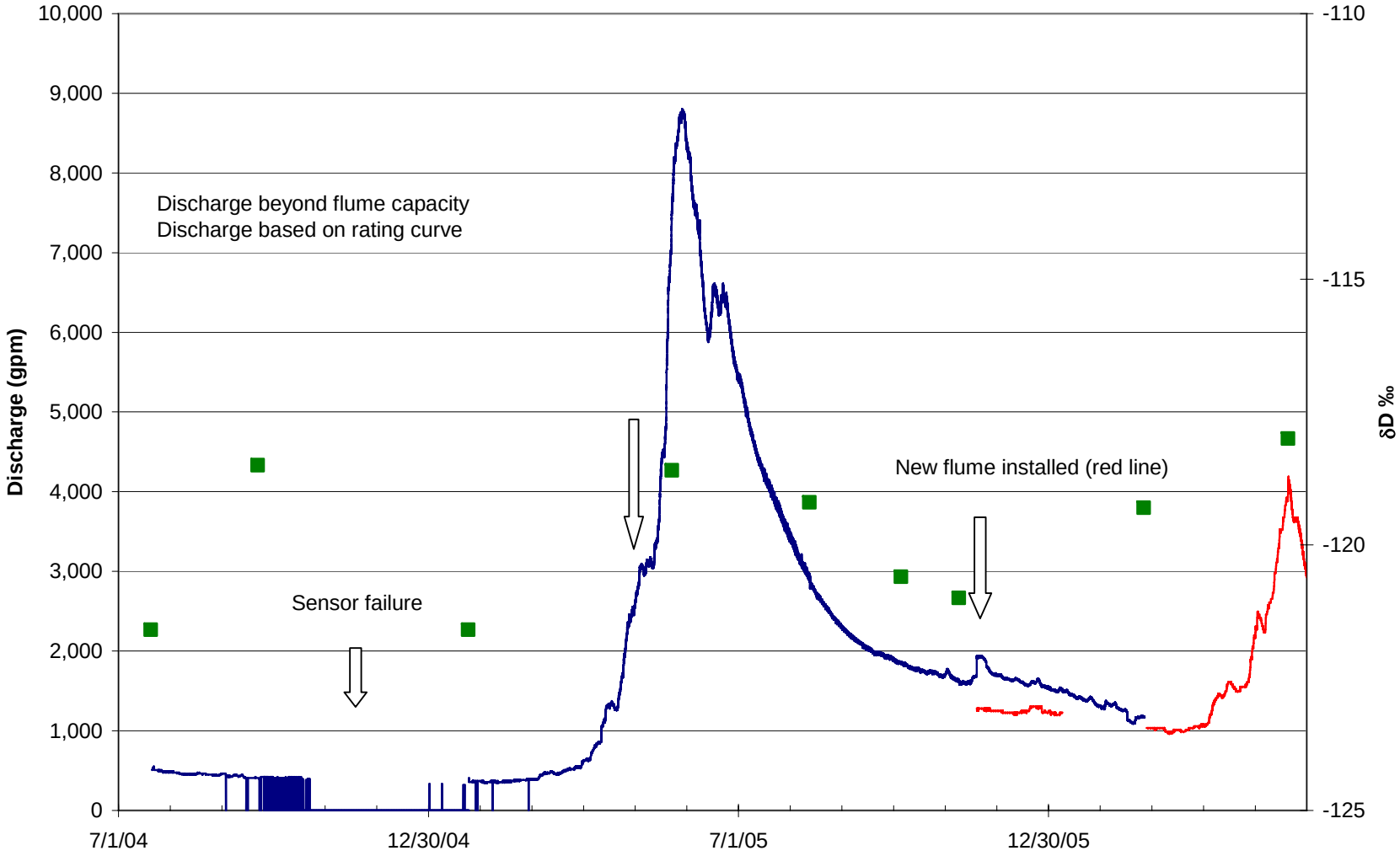


Figure 7a. Spring flow at the Kalamazoo monitoring spring WR-6 in the Schell Creek Range. Deuterium concentrations from quarterly sampling are indicated by green squares.

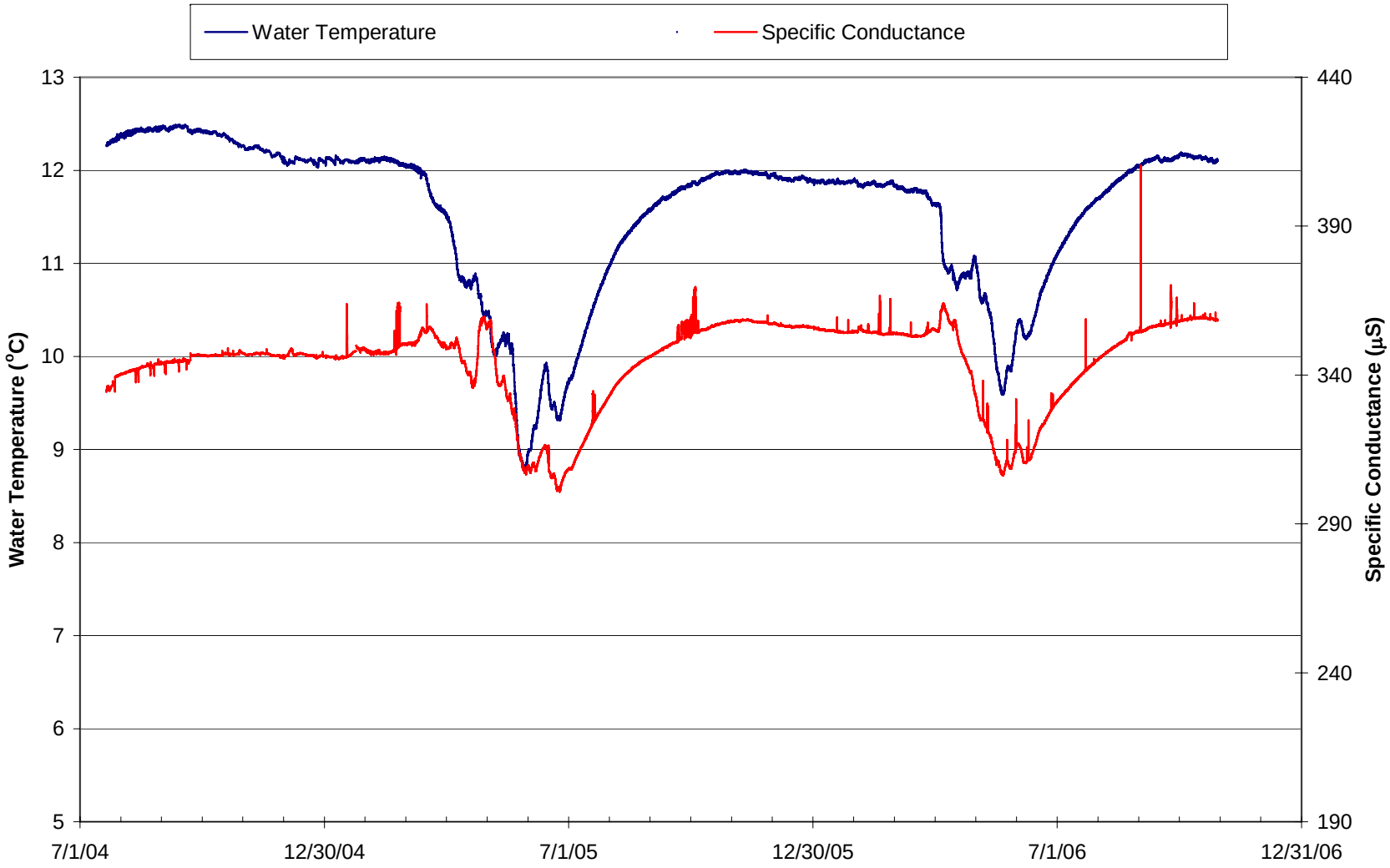


Figure 7b. Water temperature and specific conductance at the Kalamazoo monitoring spring WR-6 in the Schell Creek Range.

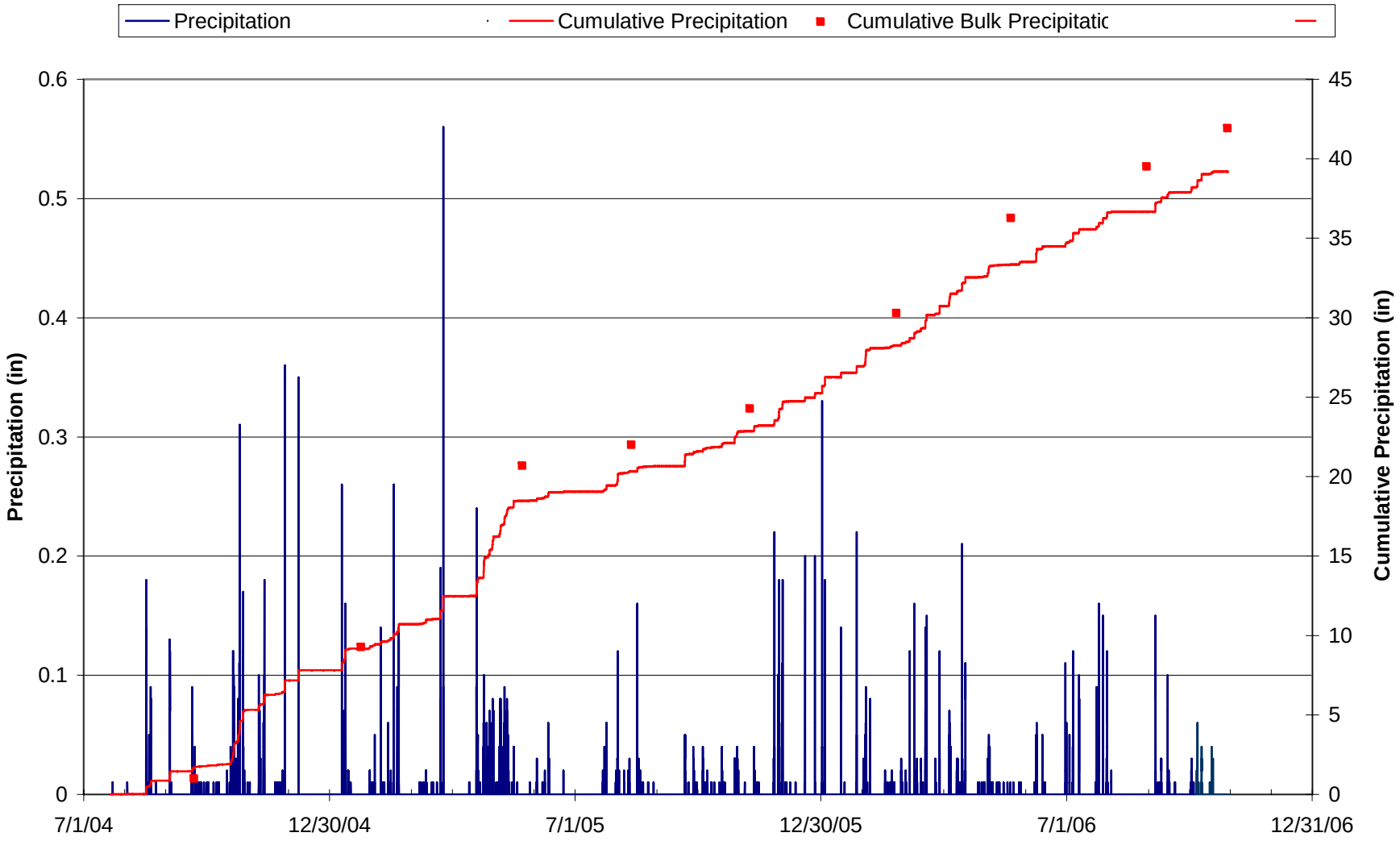


Figure 7c. Precipitation at the Kalamazoo monitoring spring WR-6 in the Schell Creek Range. Red squares indicate the volume of precipitation measured in the bulk precipitation gages.

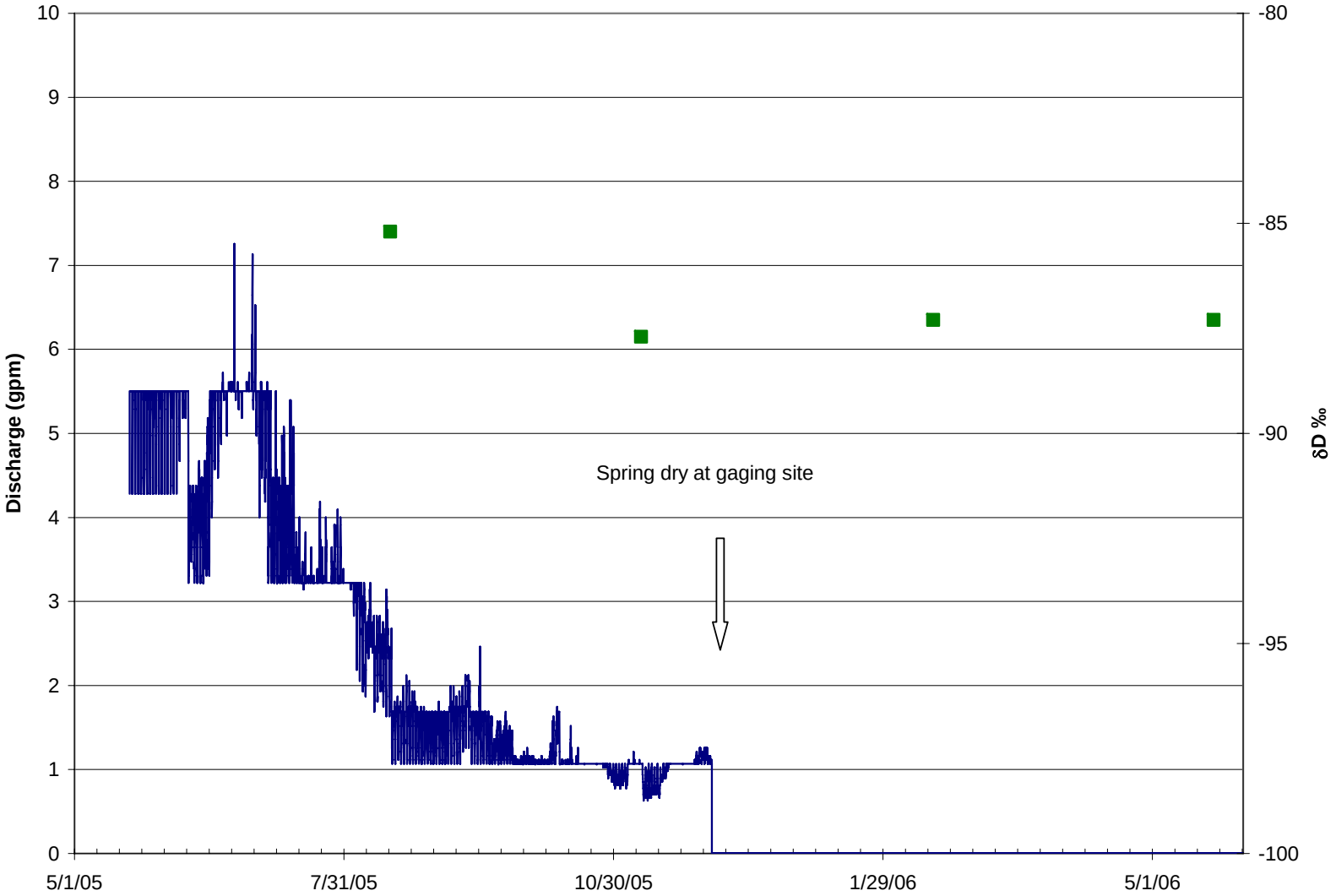


Figure 8a. Spring flow at the Grapevine monitoring spring WR-7 in the Meadow Valley Mountains. Deuterium concentrations from quarterly sampling are indicated by green squares.

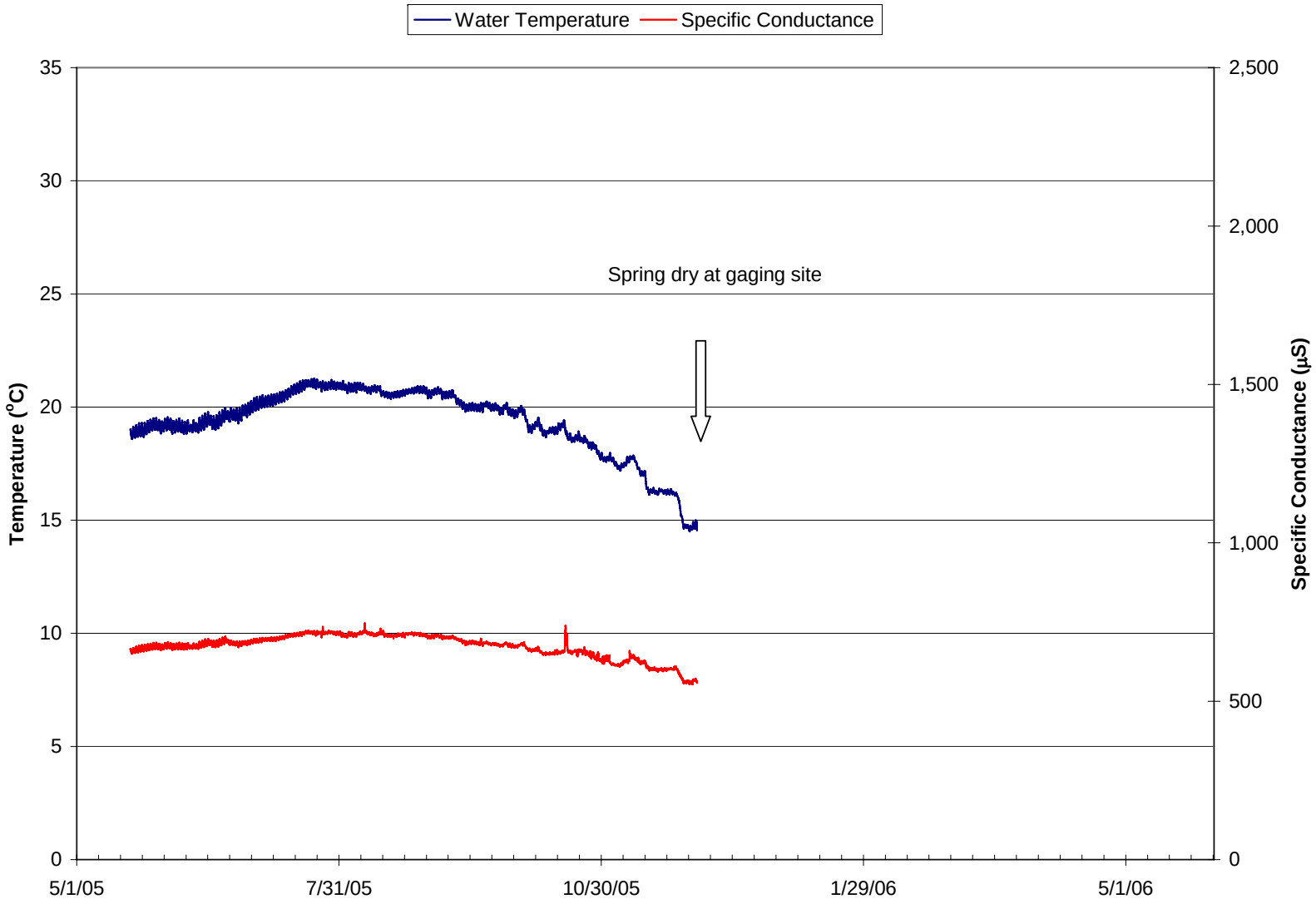


Figure 8b. Water temperature and specific conductance at the Grapevine monitoring spring WR-7 in the Meadow Valley Mountains.

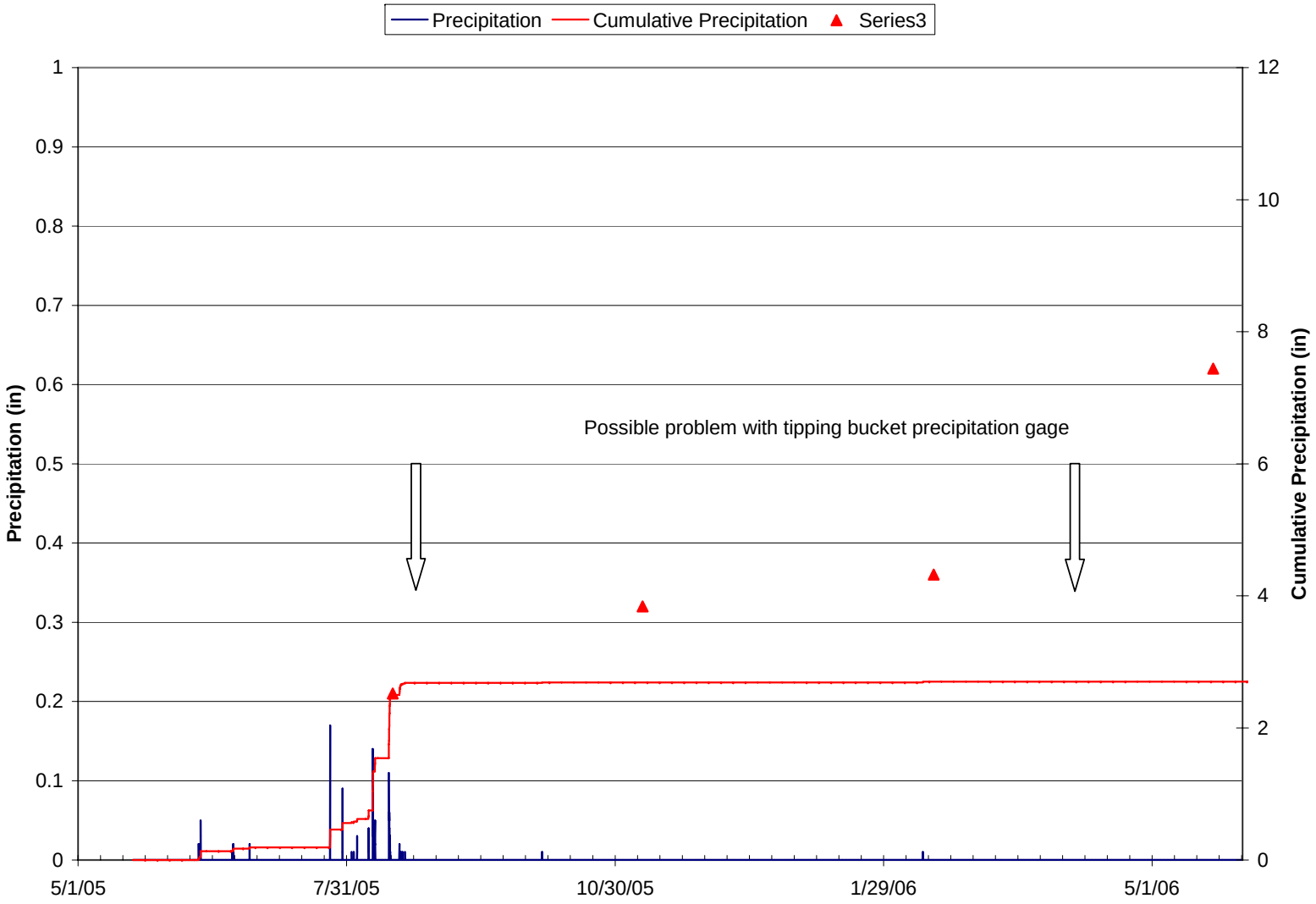


Figure 8c. Precipitation at the Grapevine monitoring spring WR-7 in the Meadow Valley Mountains. Red squares indicate the volume of precipitation measured in the bulk precipitation gages.

2-foot H-flume was installed to measure spring flow. In March 2005, the wires from the tipping bucket precipitation gage adjacent to the spring became disconnected from the datalogger due to the large snow pack. Although the tipping bucket data were lost during this time period, the bulk storage gage recorded the total amount of precipitation during this period (Figure 2c). However, this amount was not added to the tipping bucket total, so this amount is considerably less than the total storage gage amount after this time.

The recharge area monitoring site in the central Egan Range (White River 2 [WR-2]) was installed October 15, 2003, at an elevation of 8,747 feet. This small unnamed spring is located on the western slope of the range. Access to this site is usually limited to skiing from December to June. Because of the limited access, water samples were not always collected in the winter. In July 2004, the flume was disturbed by either wildlife or cattle, which resulted in data loss for a two-month period of time. During the September field visit, the flume was fixed and armored with rock to deter wildlife from accessing the spring orifice where the equipment is installed.

The recharge area monitoring site in the southern Schell Creek Range (White River 3 [WR-3]) was installed October 30, 2003, at an elevation of 7,484 feet. This unnamed spring is located on the east side of the range adjacent to Patterson Pass. Although this spring has a relatively small discharge, it is located in a large diffuse discharge zone with many orifices. The spring discharge record for the winter of 2003-2004 was lost due to a faulty depth sensor.

The recharge area monitoring site in the Delamar Range (White River 4 [WR-4]) was installed at Upper Riggs Spring on April 29, 2004, at an elevation of 5,163 feet. The only location suitable for the monitoring equipment was located 200 feet downstream of the spring orifice. The water temperature (Figure 5b) is affected by the distance traveled of this slow moving stream. In October 2004, heavy precipitation in southeastern Nevada caused considerable runoff, which washed out the H-flume. Because Upper Riggs Spring was located in a wash and was affected by surface water runoff, a decision was made to relocate this monitoring site to Grapevine Spring in the nearby Meadow Valley Mountains (White River 7 [WR-7]: site MM-1 on Figure 1b). The recharge area monitoring site at Grapevine Spring was installed in May 2005 at an elevation of 3,649 feet.

The recharge area monitoring site in the Wilson Creek Range (White River 5 [WR-5]) was installed at Headwaters Spring at an elevation of 8,000 feet on June 22, 2004. Access to this site is on a long jeep trail and thus it is only accessible after the winter snow has melted. In August 2004, the spring stopped flowing from the source where the monitoring equipment was installed; however, spring flow did persist downstream of the monitoring site. In November 2004, spring flow resumed at the monitoring site. Because of the difficult access to this site when snow is present, an autosampler was installed to collect spring samples on a monthly basis. These samples were used to fill in the stable isotopic record.

The recharge area monitoring site in the northern Schell Creek Range (White River 6 [WR-6]) was installed on an unnamed spring in Kalamazoo Canyon at an elevation of 7,221 feet on July 20, 2004. An intermittent failure was observed from the sensor that measures discharge in January 2005 (Figure 7a). Although the sensor could not be replaced at this time, the datalogger was reprogrammed to acquire a continuous record. In April 2005, discharge from the spring exceeded the capacity of the H-flume. At that time, discharge

measurements were made by the area-velocity method to provide an estimate for a continuous discharge record (Appendix C). As can be seen in Figure 7a, the recession of the high spring flow began at the end of May, where the maximum discharge was estimated at greater than 8,000 gallons per minute. On November 18, 2005, a new 2.5-foot H-flume was installed 20 feet downstream of the original flume.

At the six recharge area monitoring sites, the amount of precipitation was measured using tipping bucket precipitation gages and storage gages and quarterly precipitation samples were collected from storage gages for isotopic (δD and $\delta^{18}O$) analysis. The quantity of precipitation measured by these two different gages is presented in Figures 2c through 8c and the isotopic composition of the quarterly precipitation samples are presented in Appendix B and shown graphically in Figures 9 and 10. Although the deuterium and oxygen-18 concentrations of precipitation vary widely throughout the year (Figures 9 and 10), the precipitation volume-weighted deuterium and oxygen-18 values for each site more closely follows that of winter precipitation than summer precipitation (Figure 11). These volume-weighted precipitation values are close to winter precipitation values (at six of the seven sites) because of the lack of significant summer precipitation during the period of data collection. In contrast, the δD values of springs adjacent to precipitation collectors vary little throughout the year (Figures 2a to 8a) and are more similar to the δD winter precipitation and volume weighted precipitation values than the summer precipitation values (Figure 11). This similarity of spring water and winter precipitation δD values is either because of the small amount of summer precipitation during the period of data collection or because winter precipitation is the primary recharge source for these springs.

In summer 2005, the recharge area monitoring sites were modified. Fences were installed around the precipitation gages to deter livestock from bumping into the gages, and sensor wires were encased in electrical conduit to protect them from rodents. Also, snow melt collectors (snowsotopoter—modified Büchner funnel) were installed at all recharge sites with the exception of Grapevine Spring in the Meadow Valley Mountains in southern Nevada, which rarely experiences snowfall. These collectors are designed to passively collect water samples from melting snow. Since isotopic fractionation can occur as the snow pack evolves and melts, these samples should be more representative of local recharge than bulk precipitation samples that are not allowed to evaporate. Local recharge should be reflected in the isotopic composition of the recharge area springs located adjacent to the precipitation collection sites. Figure 9 shows the stable isotope (δD and $\delta^{18}O$) values from the Snowsotopoter precipitation samplers along with the bulk precipitation samples.

**Regional Springs**

Three springs in the Muddy River Springs area and eight regional warm springs were chosen for quarterly monitoring to establish baseline variability of chemical and isotopic composition. Data for these 11 regional warm springs are provided in Appendix C. Temperature loggers were installed in 8 of the 11 regional springs to determine if long-term temperature trends exist. Temperature plots from the recorders along with quarterly deuterium values are presented in Figures 12 through 19. The placement of the temperature loggers is critical in obtaining a good record. It was recognized from initial data records that the placement of the sensor may make a difference in temperature of as much as half a degree Celsius as observed in the record from Crystal Spring (Figure 19). Data gaps in the temperature records are the result of vandalism of the temperature loggers.

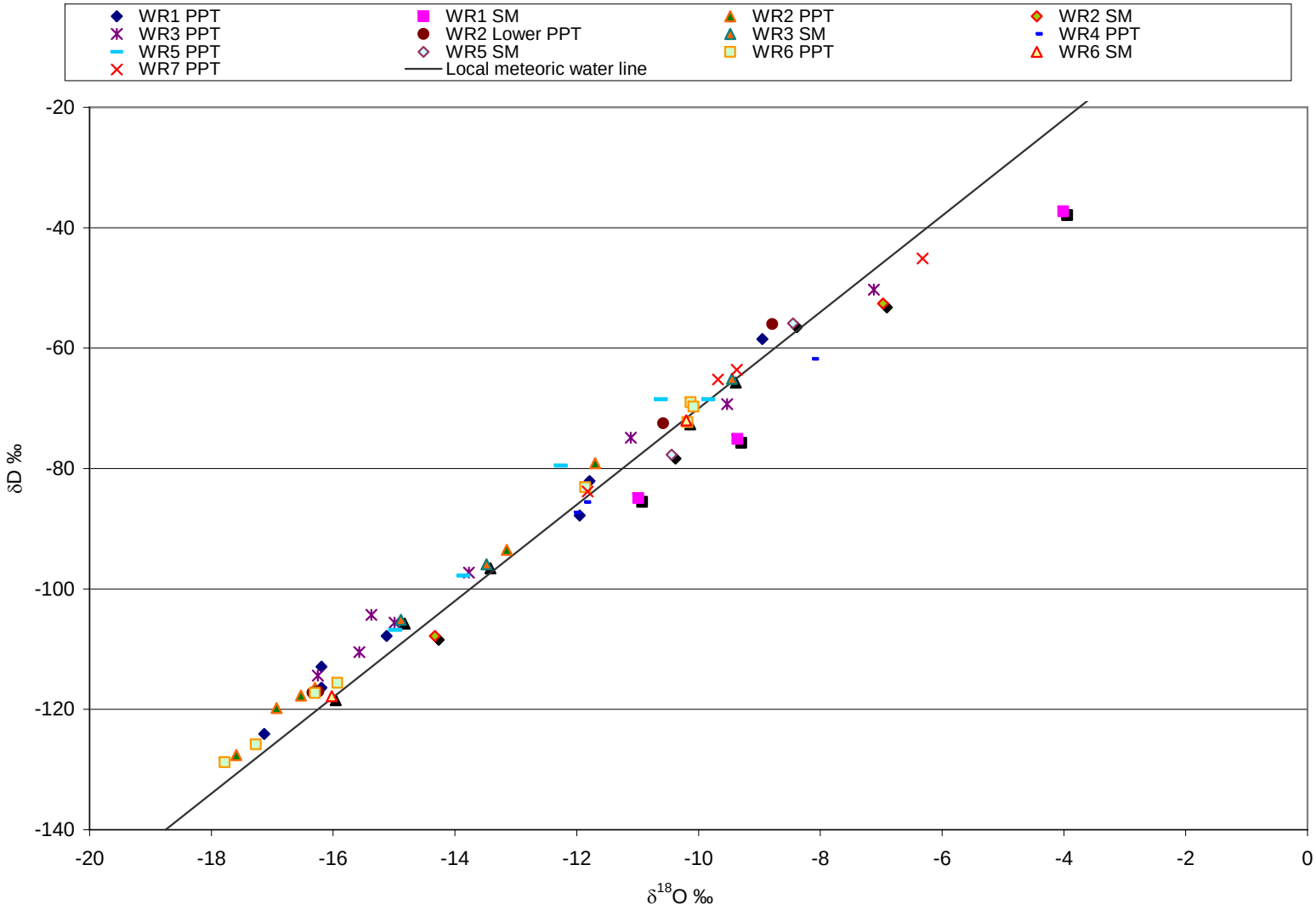


Figure 9. A plot of $\delta^{18}O$ versus δD for storage precipitation gage samples (PPT) and snowsotopoter (snow melt collector) samples (SM) at the high- altitude monitoring sites.

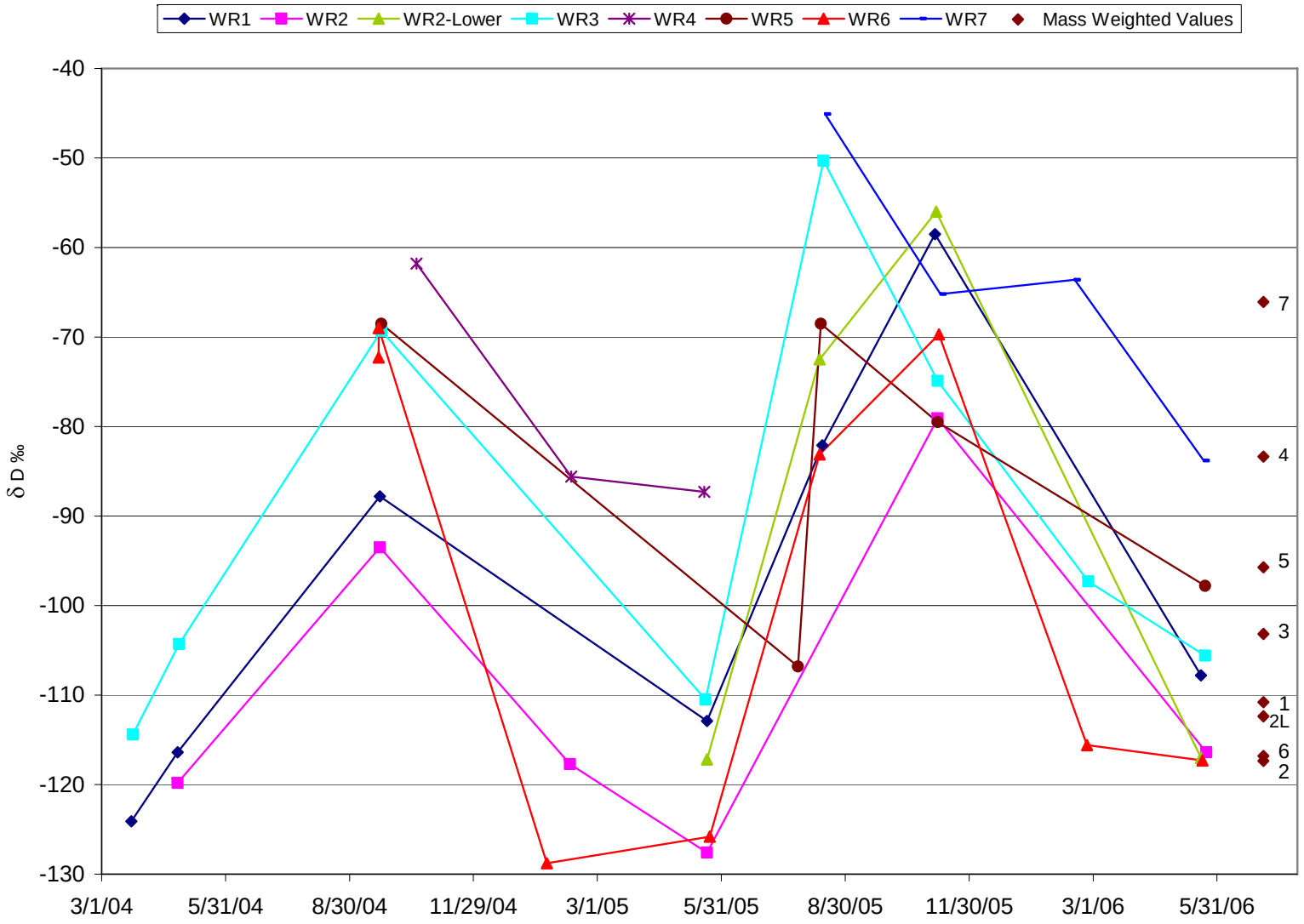


Figure 10. Deuterium concentrations measured for precipitation at the recharge area monitoring sites from March 2004 to May 2006. The volume-weighted average values are also plotted.

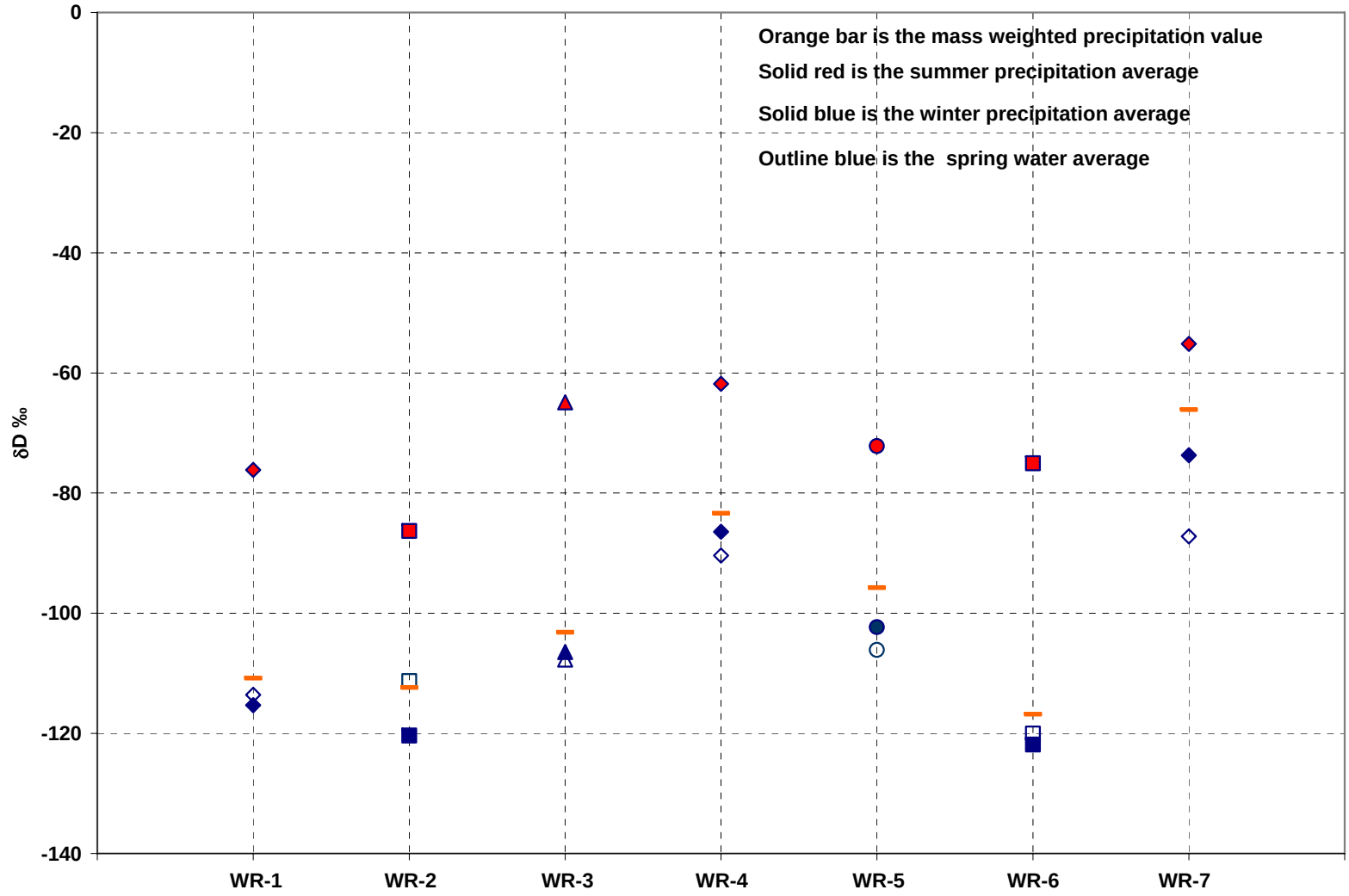


Figure 11. Variation of deuterium of summer and winter precipitation and volume weighted precipitation deuterium values as compared to spring values for the seven recharge area spring sites (WR1 to WR7).

## DATA VARIABILITY

One of the objectives of this project is to determine the variability of the hydrologic system, and although this report is only an interim data report, a brief presentation of the variability follows. Water samples have been collected from the recharge area and regional discharge area springs on a quarterly basis. The general variability of quarterly measurements of the field parameters, ions, and isotopic values is presented in Tables 1 and 2. Table 1 presents the average (mean), standard deviation, and median values for the recharge area springs. Table 2 presents the average (mean), standard deviation, and median values of the regional discharge area springs. These tables show the general variability of the chemical and isotopic compositions of the recharge area and discharge area waters.

The variability of hydrologic and geochemical parameters of the recharge area monitoring springs is presented for the continuously measured parameters of water temperature, specific conductance, and spring discharge (Figures 2 through 8). Of particular interest in these figures is the response of WR-1 (Figures 2a and 2b) and WR-6 (Figures 7a and 7b) to above average precipitation in the winter of 2004-2005. Both of these recharge area springs are large (greater than 2 cfs) carbonate springs. Both of these springs responded very quickly to winter precipitation and spring snowmelt. The specific conductance at WR-1 increased with increasing spring flow, whereas it decreased with increased spring flow at WR-6. Although major-ion chemistry showed some variability and in the example given above in opposite directions as indicated by the specific conductance data, the range in deuterium values for all the recharge area spring waters was a maximum of only 4.5 permil, for the White Pine monitoring Spring (WR-1), with standard deviations of less than 1.5 permil, excluding one Upper Riggs Spring (WR-4) sample that was a very isotopically light snow melt event (Table 1).

The variability of continuously measured water temperature and quarterly isotopic measurements for regional discharge area springs are presented in Figures 12 through 19. Although some of the springs show variability of water temperature, it is not as pronounced as that observed in the recharge springs. The major-ion chemistry data for these regional springs show little variability and the deuterium data greatest variation is only 3.0 permil, for Preston Big Spring, with most springs showing less than a 2-permil variation and a standard deviation of less than 1.3 permil (Table 2 and Appendix C).

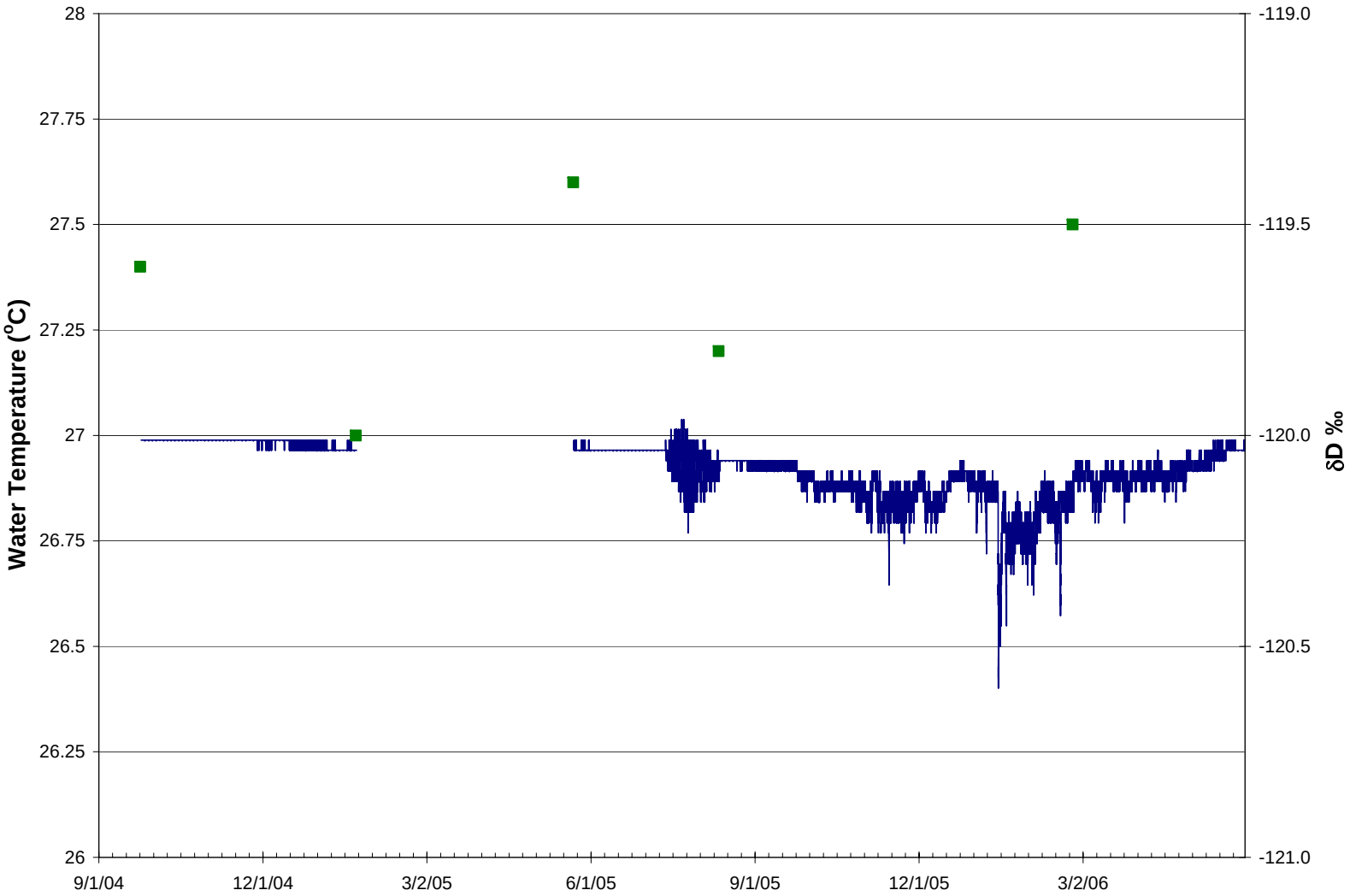


Figure 12. Water temperature and δD (green squares) of Gandy Warm Spring in Snake Valley from September 2004 to June 2006.

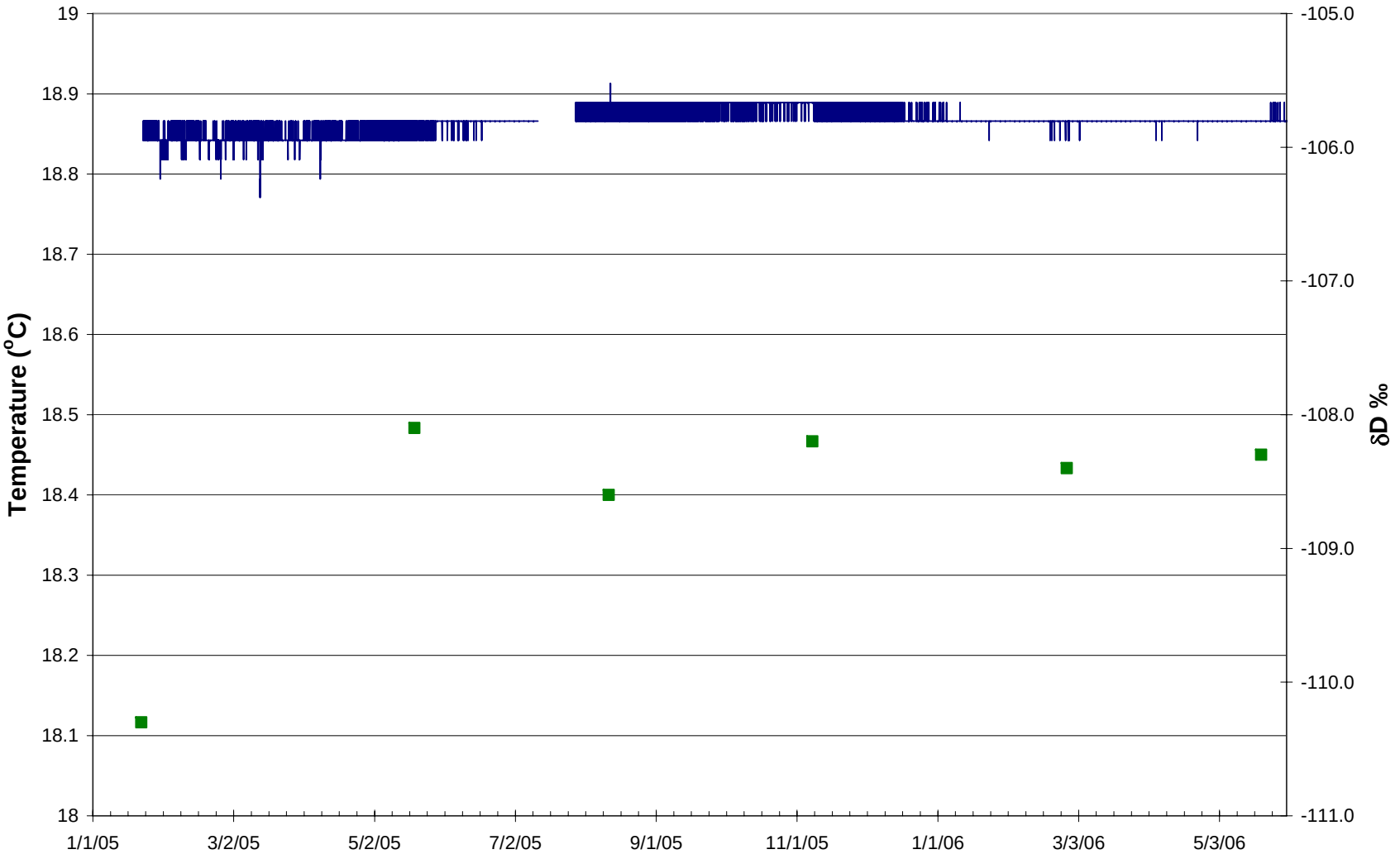


Figure 13. Water temperature and δD (green squares) of a flowing well at the Cedars in Spring Valley from January 2005 to June 2006.

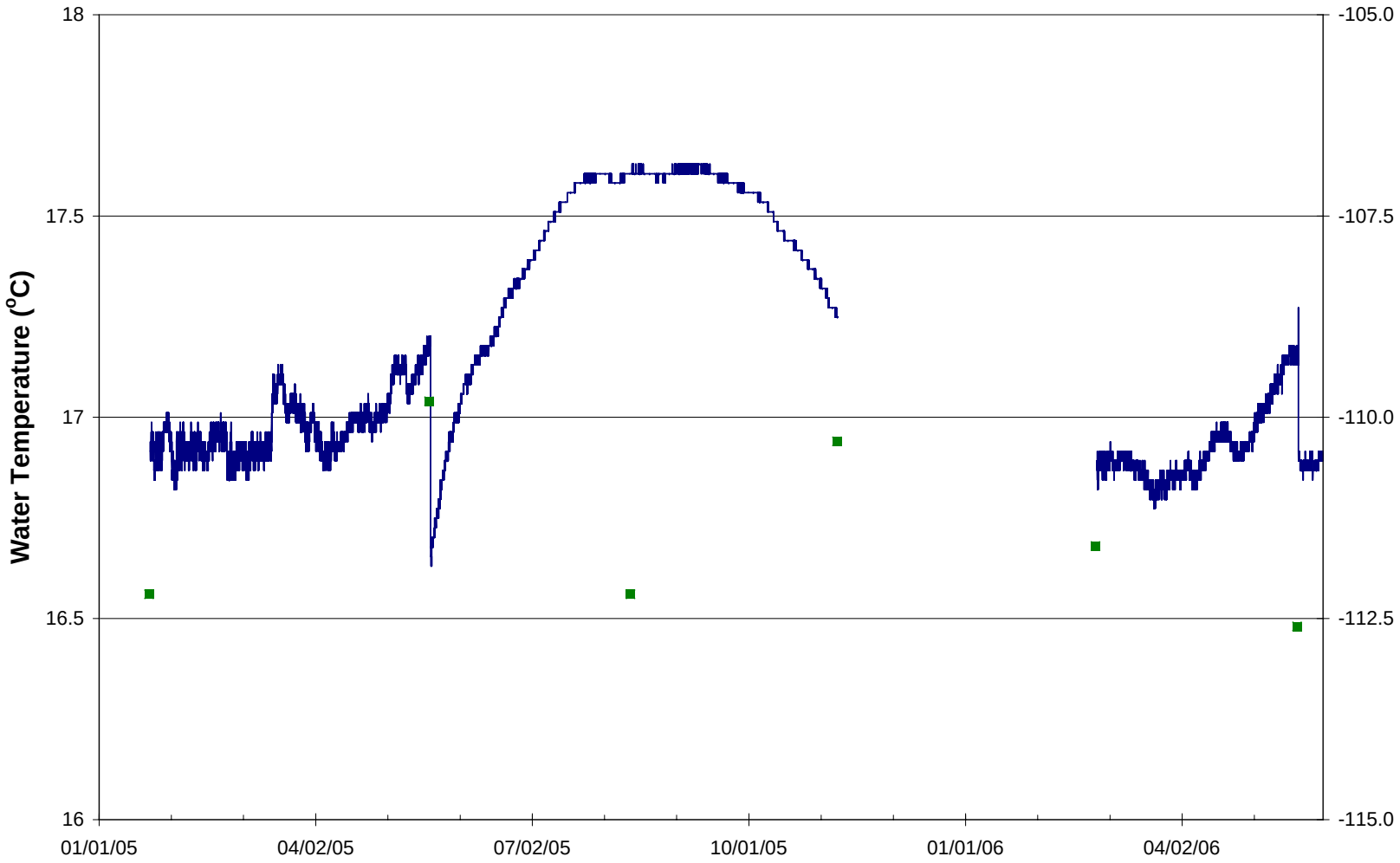


Figure 14. Water temperature and δD (green squares) of Big Spring in Snake Valley from January 2005 to June 2006.

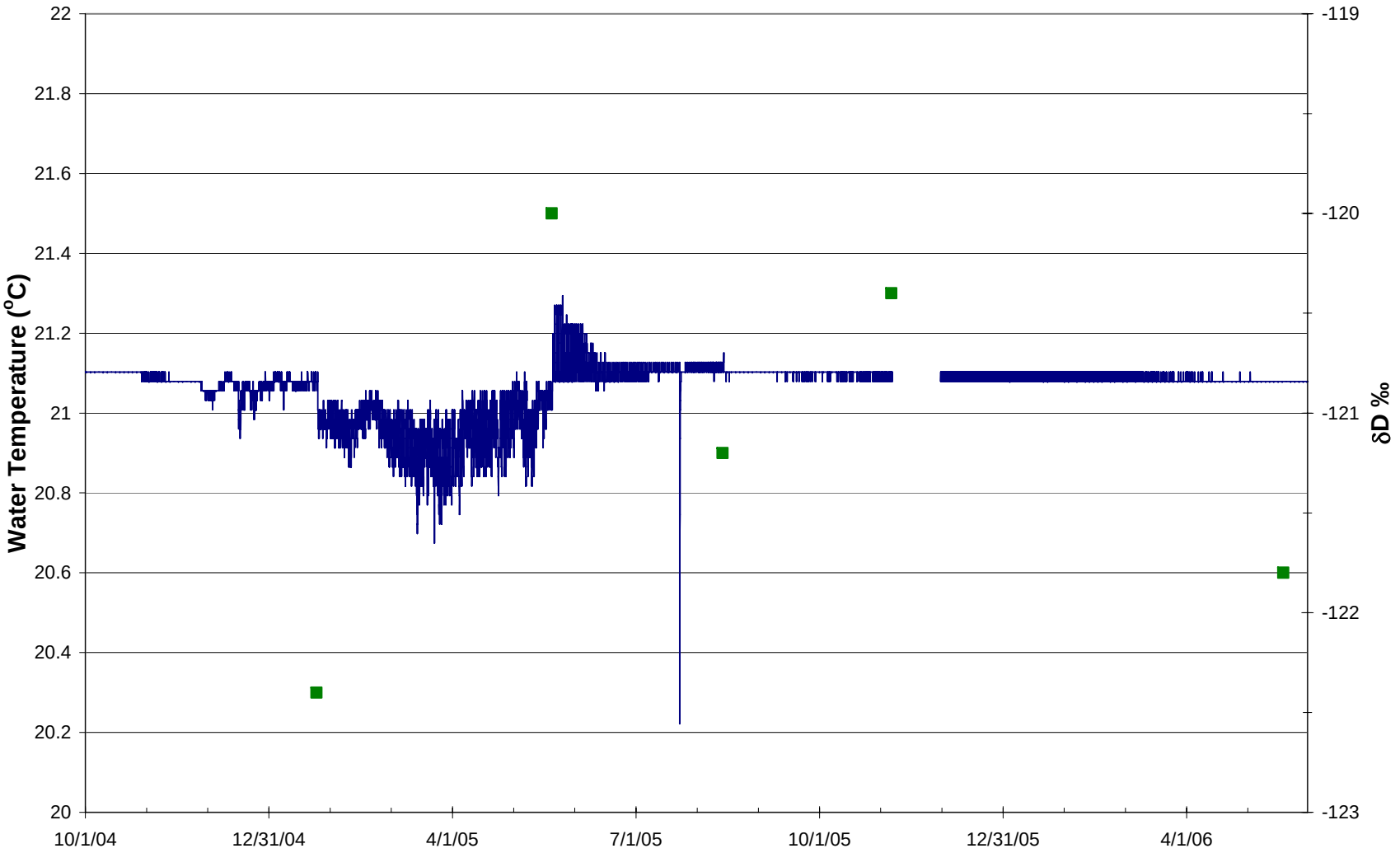


Figure 15. Water temperature and δD (green squares) of Preston Big Spring in White River Valley from October 2004 to June 2006.

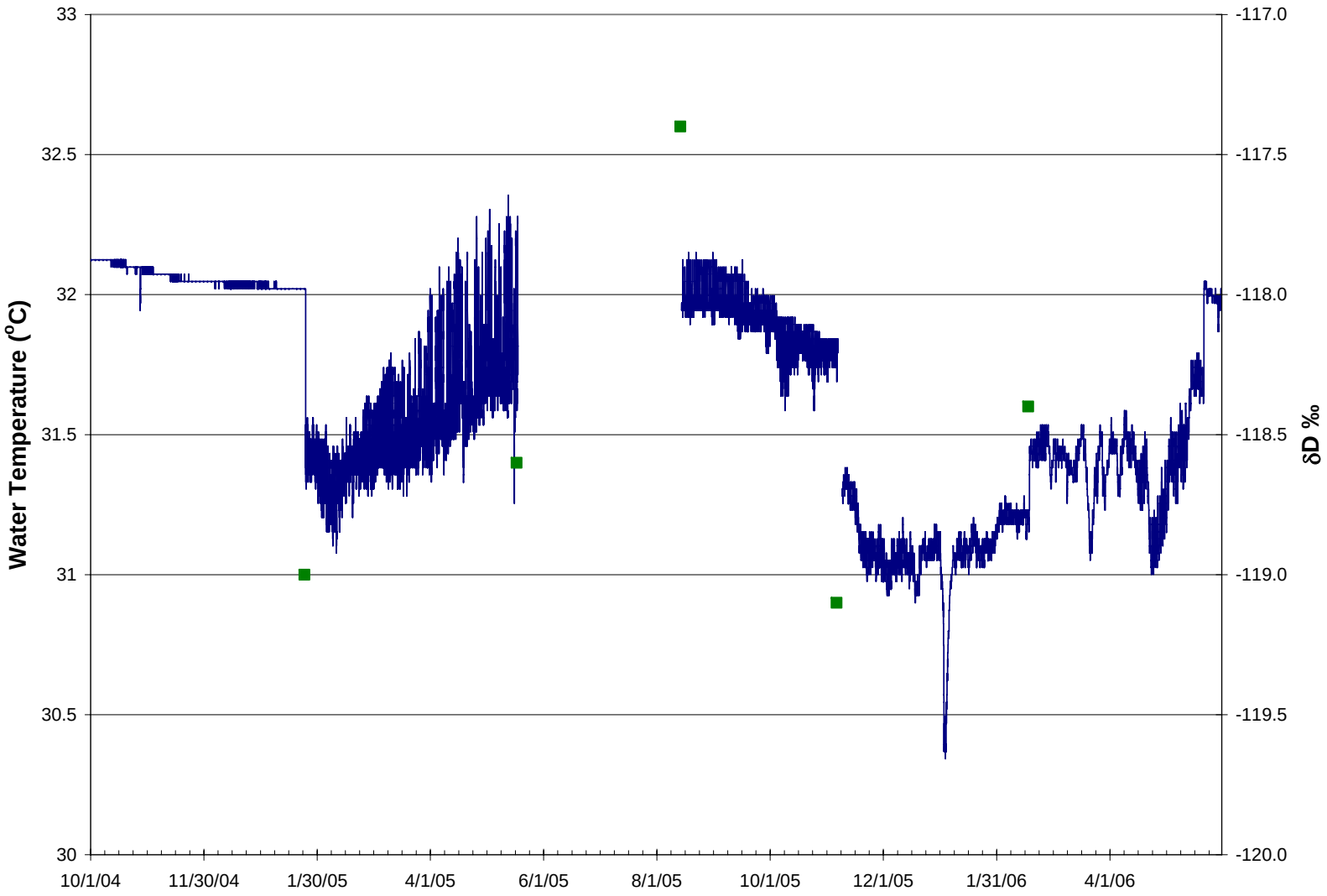


Figure 16. Water temperature and δD (green squares) of Hot Creek Spring in White River Valley from October 2004 to June 2006.

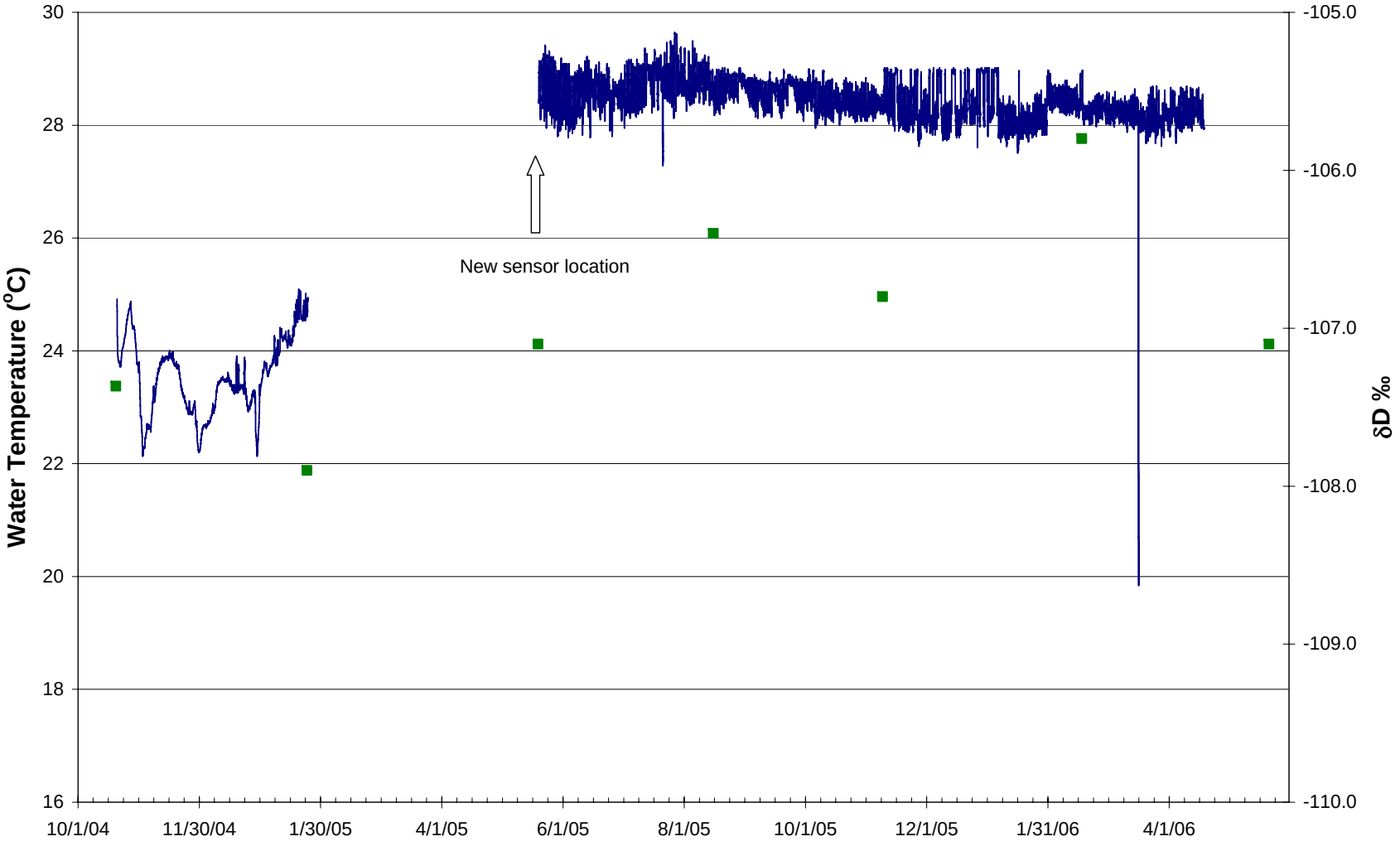


Figure 17. Water temperature and δD (green squares) of Panaca Spring in Meadow Valley from October 2004 to June 2005.

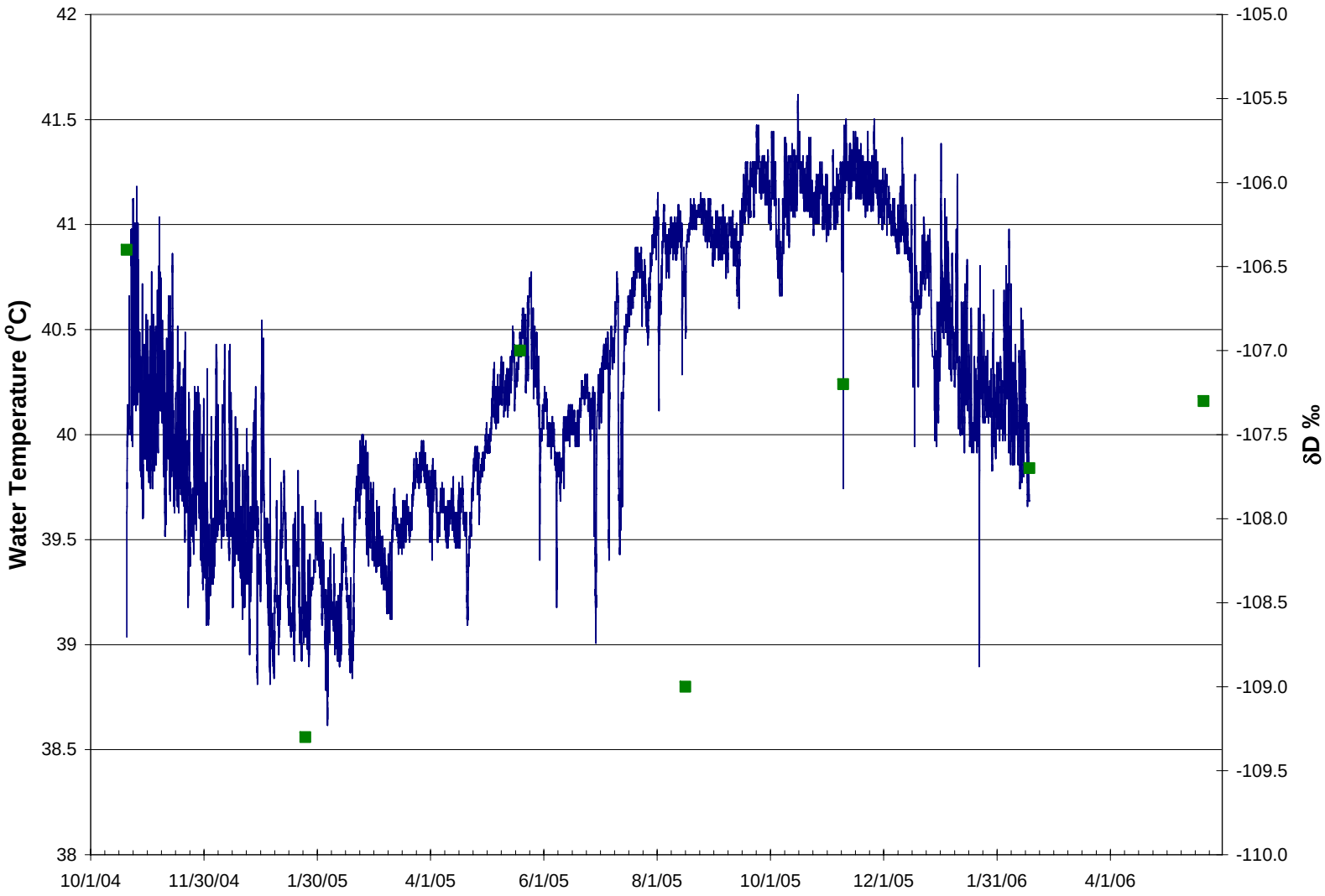


Figure 18. Water temperature and δD (green squares) of Caliente Hot Springs Hotel in Meadow Valley from October 2004 to June 2006.

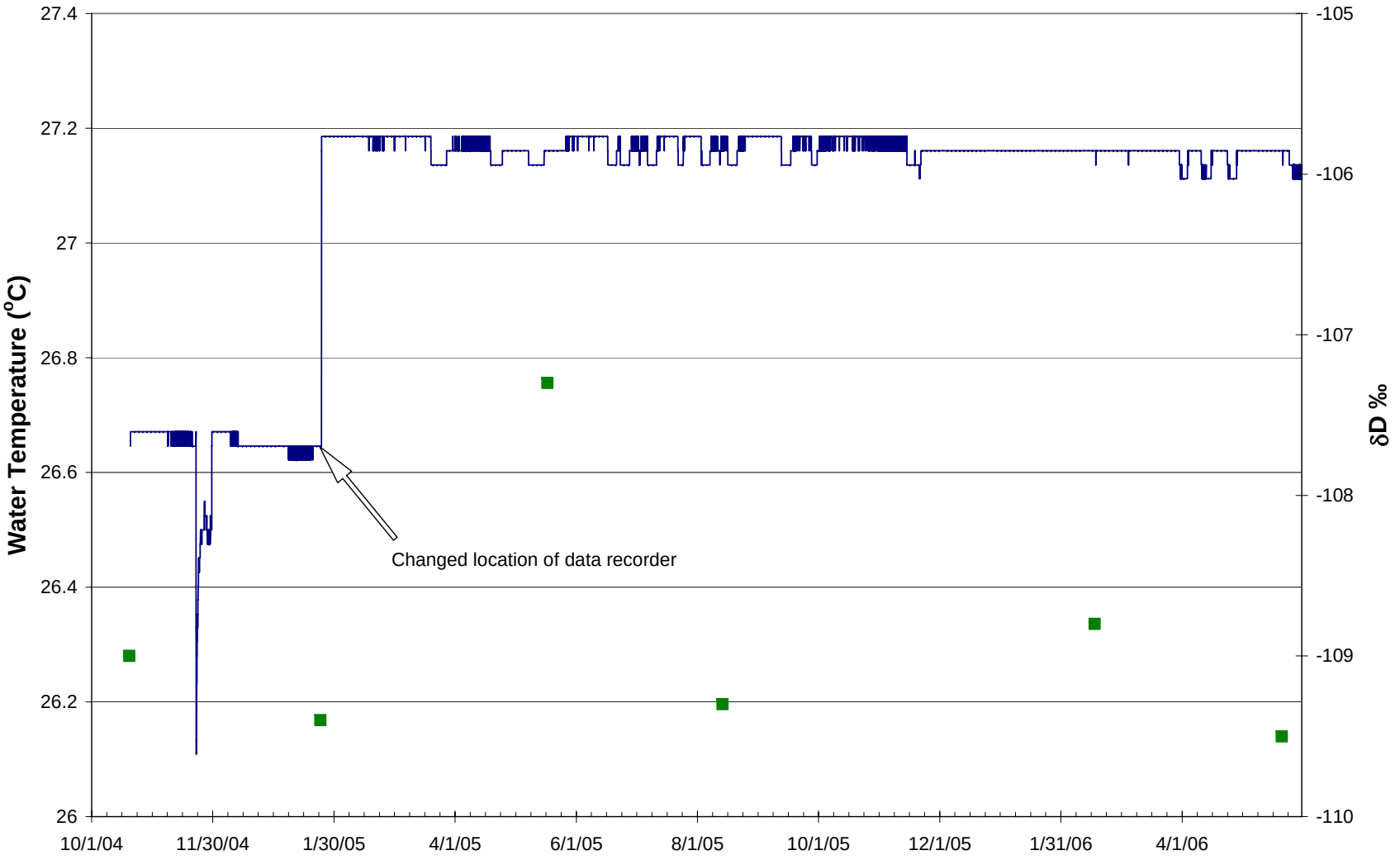


Figure 19. Water temperature and δD (green squares) of Crystal Spring in Pahrangat Valley from October 2004 to June 2006.

Table 1. Average, standard deviation and median values of field parameters, ions and isotopic values for the recharge area springs.

| Site Name | | Water Temp (C) | pH field | EC field | DO mg/l | Ca mg/l | Mg mg/l | Na mg/l | K mg/l | Cl mg/l | $SO_4$ mg/l | $HCO_3$- lab mg/l | $CO_3$- lab mg/l | $SiO_2$ mg/l | F mg/l | $NO_3$ as N mg/l | $^{18}O$ ‰ | Deuterium ‰ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring | Average | 6.04 | 7.40 | 341 | 9.14 | 63.7 | 9.38 | 2.57 | 0.68 | 1.17 | 4.02 | 231 | 0.23 | 8.11 | 0.06 | 0.14 | -15.57 | -113.6 |
| Spring WR-1 | SD | 0.67 | 0.49 | 63 | 0.69 | 10.1 | 1.71 | 0.32 | 0.14 | 0.10 | 0.68 | 21.72 | 0.64 | 1.41 | 0.03 | 0.13 | 0.11 | 1.35 |
| | Median | 5.90 | 7.46 | 349 | 9.39 | 60.5 | 9.88 | 2.48 | 0.64 | 1.20 | 4.30 | 227 | 0.00 | 7.50 | 0.05 | 0.08 | -15.58 | -113.8 |
| Upper Terrace | Average | 7.83 | 7.45 | 280 | 7.57 | 40.6 | 10.76 | 4.16 | 0.77 | 2.29 | 7.57 | 170 | 0.00 | 11.41 | 0.10 | 0.65 | -15.40 | -113.79 |
| Spring WR-2 | SD | 0.34 | 0.41 | 5.61 | 1.17 | 0.77 | 0.33 | 0.28 | 0.07 | 0.20 | 0.46 | 4.60 | 0.00 | 0.93 | 0.01 | 0.61 | 0.06 | 1.35 |
| | Median | 7.85 | 7.58 | 279 | 8.05 | 40.4 | 10.80 | 4.14 | 0.75 | 2.30 | 7.40 | 172 | 0.00 | 11.80 | 0.09 | 0.38 | -15.41 | -114.05 |
| Patterson Pass | Average | 11.76 | 6.72 | 131 | 5.70 | 19.4 | 3.92 | 2.11 | 1.42 | 1.06 | 9.26 | 67 | 0.00 | 10.48 | 0.46 | 0.25 | -14.82 | -107.7 |
| Spring WR-3 | SD | 0.24 | 0.47 | 7.38 | 0.89 | 0.62 | 0.32 | 0.38 | 0.04 | 0.13 | 0.47 | 2.44 | 0.00 | 0.44 | 0.01 | 0.09 | 0.07 | 1.02 |
| | Median | 11.75 | 6.74 | 131 | 5.99 | 19.4 | 3.81 | 1.97 | 1.42 | 1.05 | 9.35 | 66 | 0.00 | 10.35 | 0.46 | 0.22 | -14.83 | -107.6 |
| Upper Riggs | Average | 11.49 | 7.31 | 414 | 5.28 | 53.9 | 13.78 | 16.32 | 3.18 | 13.92 | 10.34 | 233 | 0.00 | 51.12 | 0.41 | -- | -12.46 | -90.4 |
| Spring WR-4 | SD | 4.01 | 0.44 | 92 | 3.82 | 12.14 | 3.40 | 3.32 | 0.83 | 4.31 | 2.00 | 53.35 | 0.00 | 6.56 | 0.08 | -- | 1.16 | 7.85 |
| | Median | 11.20 | 7.30 | 452 | 4.40 | 57.6 | 15.90 | 17.60 | 3.36 | 16.40 | 10.20 | 256 | 0.00 | 49.80 | 0.40 | -- | -11.95 | -87.0 |
| Headwaters | Average | 11.12 | 6.58 | 100 | 6.45 | 11.8 | 2.61 | 4.91 | 1.24 | 4.82 | 4.04 | 43 | 0.00 | 20.66 | 0.07 | 1.24 | -14.78 | -108.8 |
| Spring WR-5 | SD | 2.44 | 0.82 | 8.20 | 0.36 | 1.26 | 0.23 | 0.35 | 0.08 | 0.79 | 0.64 | 5.59 | 0.00 | 0.96 | 0.01 | 0.52 | 0.17 | 1.11 |
| | Median | 10.50 | 6.36 | 96 | 6.50 | 11.8 | 2.54 | 4.88 | 1.21 | 4.50 | 4.40 | 44 | 0.00 | 21.10 | 0.07 | 1.18 | -14.69 | -108.8 |
| Kalamazoo | Average | 11.50 | 7.32 | 350 | 7.20 | 49.3 | 15.57 | 3.15 | 0.74 | 1.90 | 11.37 | 209 | 0.00 | 11.51 | -- | 0.27 | -16.20 | -120.1 |
| Spring WR-6 | SD | 1.02 | 0.21 | 15.81 | 0.48 | 2.63 | 1.87 | 0.37 | 0.08 | 0.12 | 1.38 | 7.23 | 0.00 | 0.64 | -- | 0.02 | 0.05 | 1.30 |
| | Median | 11.90 | 7.33 | 351 | 7.14 | 49.1 | 16.00 | 3.20 | 0.74 | 1.90 | 11.40 | 209 | 0.00 | 11.50 | -- | 0.28 | -16.20 | -120.0 |
| Grapevine | Average | 17.30 | 7.40 | 575 | 3.47 | 77.6 | 17.70 | 18.75 | 2.46 | 31.58 | 44.70 | 238 | 0.00 | 26.65 | 0.66 | 3.56 | -11.94 | -87.2 |
| Spring WR-7 | SD | 3.64 | 0.40 | 16.86 | 2.20 | 1.21 | 0.32 | 1.01 | 0.40 | 1.12 | 1.60 | 7.93 | 0.00 | 1.75 | 0.04 | 0.62 | 0.05 | 1.44 |
| | Median | 18.25 | 7.53 | 574 | 3.62 | 77.3 | 17.75 | 18.40 | 2.50 | 31.75 | 44.65 | 240 | 0.00 | 27.05 | 0.67 | 3.50 | -11.93 | -87.5 |

Table 2. Average, standard deviation and median values of the field parameters, ions and isotopic values for the discharge area springs.

| Site Name | | Water Temp (C) | pH field | EC field | DO mg/l | Ca mg/l | Mg mg/l | Na mg/l | K mg/l | Cl mg/l | $SO_4$ mg/l | $HCO_3$-lab mg/l | $CO_3$-lab mg/l | $SiO_2$ mg/l | F mg/l | $NO_3$ as N mg/l | $^{18}O$ ‰ | Deuterium ‰ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Panaca Spring | Average | 28.62 | 7.48 | 409 | 4.54 | 32.5 | 10.19 | 37.63 | 7.10 | 17.57 | 29.58 | 178.67 | 50.22 | 1.45 | 0.11 | 0.69 | -14.18 | -106.9 |
| | SD | 0.23 | 0.35 | 4.22 | 0.50 | 1.39 | 0.19 | 0.38 | 0.19 | 0.30 | 0.47 | 2.42 | 1.72 | 0.06 | 0.01 | 0.08 | 0.05 | 0.74 |
| | Median | 28.65 | 7.64 | 408 | 4.51 | 32.7 | 10.25 | 37.75 | 7.07 | 17.60 | 29.50 | 178.50 | 49.35 | 1.42 | 0.11 | 0.66 | -14.18 | -106.9 |
| Big Spring | Average | 17.18 | 7.34 | 390 | 5.17 | 46.8 | 19.90 | 5.36 | 1.51 | 5.52 | 8.48 | 229.60 | 12.80 | 0.13 | 0.03 | 0.48 | -15.16 | -111.2 |
| | SD | 0.33 | 0.29 | 5.18 | 0.22 | 2.19 | 0.35 | 0.08 | 0.02 | 0.27 | 0.11 | 2.51 | 0.40 | 0.00 | 0.01 | 0.01 | 0.04 | 1.11 |
| | Median | 17.20 | 7.50 | 389 | 5.16 | 47.5 | 19.90 | 5.34 | 1.51 | 5.50 | 8.50 | 229.00 | 12.70 | 0.13 | 0.03 | 0.49 | -15.15 | -111.6 |
| Hot Creek | Average | 31.30 | 7.16 | 540 | 1.41 | 59.0 | 21.92 | 24 | 2 | 10.12 | 44.88 | 274.50 | 28.23 | 0.99 | 0.07 | 0.10 | -15.70 | -118.8 |
| | SD | 0.29 | 0.22 | 5.34 | 0.21 | 0.63 | 0.40 | 0. | 7 | 0.15 | 0.55 | 5.68 | 0.73 | 0.04 | 0.00 | 0.01 | 0.04 | 1.02 |
| | Median | 31.30 | 7.23 | 541 | 1.47 | 59.0 | 22.00 | 24 | 9 | 10.10 | 45.00 | 272.50 | 28.00 | 1.00 | 0.07 | 0.10 | -15.71 | -118.8 |
| Gandy Warm Spring | Average | 26.85 | 7.37 | 491 | 5.61 | 49.9 | 16.72 | 28.68 | 3.89 | 23.55 | 22.47 | 235.83 | 22.93 | 0.61 | 0.08 | 0.70 | -15.89 | -120.2 |
| | SD | 0.14 | 0.27 | 5.00 | 0.48 | 1.36 | 0.35 | 0.43 | 0.04 | 0.38 | 0.27 | 7.31 | 0.68 | 0.03 | 0.01 | 0.01 | 0.05 | 1.30 |
| | Median | 26.90 | 7.38 | 490 | 5.64 | 50.3 | 16.80 | 28 | 0 | 23.65 | 22.55 | 236.00 | 22.75 | 0.61 | 0.08 | 0.70 | -15.89 | -119.7 |
| Crystal Spring | Average | 27.16 | 7.33 | 481 | 1.82 | 45.3 | 22.16 | 23 | 9 | 9.07 | 33.27 | 249.43 | 25.59 | 0.33 | 0.08 | 0.29 | -14.42 | -109.0 |
| | SD | 0.11 | 0.22 | 8.23 | 1.44 | 1.05 | 0.26 | 0. | 1 | 0.28 | 0.49 | 7.04 | 0.87 | 0.02 | 0.00 | 0.02 | 0.06 | 0.86 |
| | Median | 27.10 | 7.38 | 480 | 1.28 | 45.6 | 22.20 | 23.80 | 5.18 | 9.10 | 33.40 | 247.00 | 25.20 | 0.33 | 0.08 | 0.28 | -14.42 | -109.2 |
| The Cedars | Average | 18.58 | 7.85 | 132 | 7.86 | 19.9 | 1.67 | 5.75 | 0.84 | 2.04 | 3.30 | 74.00 | 21.00 | 0.19 | 0.04 | 0.12 | -15.01 | -108.7 |
| | SD | 0.31 | 0.37 | 1.26 | 0.48 | 0.22 | 0.04 | 0.11 | 0.02 | 0.05 | 0.07 | 0.91 | 0.84 | 0.01 | 0.03 | 0.01 | 0.01 | 0.90 |
| | Median | 18.70 | 7.97 | 132 | 7.86 | 20.0 | 1.68 | 5.71 | 0.84 | 2.00 | 3.30 | 74.20 | 20.70 | 0.19 | 0.03 | 0.12 | -15.02 | -108.4 |
| Caliente Hot Springs (Hotel) | Average | 40.54 | 7.76 | 493 | 3.70 | 36.3 | 7.37 | 52.06 | 18.92 | 14.88 | 41.54 | 216.60 | 120.60 | 1.42 | 0.10 | 1.31 | -14.42 | -108.0 |
| | SD | 0.72 | 0.22 | 6.44 | 0.71 | 1.36 | 0.19 | 0.73 | 0.08 | 1.45 | 2.58 | 6.77 | 2.88 | 0.06 | 0.01 | 0.19 | 0.07 | 1.05 |
| | Median | 40.40 | 7.71 | 492 | 3.95 | 35.6 | 7.36 | 51.90 | 18.90 | 14.50 | 41.00 | 215.00 | 119.00 | 1.44 | 0.09 | 1.26 | -14.43 | -107.7 |
| Preston Big Spring | Average | 21.02 | 7.46 | 403 | 2.88 | 41.7 | 19.44 | 12.98 | 3.16 | 15.86 | 38.08 | 178.00 | 20.18 | 0.34 | 0.11 | 0.56 | -15.87 | -121.3 |
| | SD | 0.16 | 0.29 | 3.56 | 0.26 | 0.63 | 0.26 | 0.38 | 0.06 | 0.09 | 0.23 | 3.74 | 0.63 | 0.01 | 0.01 | 0.02 | 0.01 | 1.16 |
| | Median | 21.10 | 7.52 | 404 | 2.98 | 41.9 | 19.40 | 12.90 | 3.15 | 15.80 | 38.10 | 176.00 | 19.90 | 0.34 | 0.11 | 0.57 | -15.87 | -121.2 |
| Pederson's Warm Spring (M-13) | Average | 31.47 | 7.35 | 944.33 | 2.96 | 65.09 | 27.78 | 96.97 | 10.76 | 63.68 | 185.22 | 256.67 | 29.46 | 2.15 | 0.18 | 0.41 | -12.95 | -97.32 |
| | SD | 0.32 | 0.07 | 10.62 | 0.70 | 0.70 | 0.36 | 2.93 | 0.58 | 1.94 | 1.99 | 4.09 | 0.75 | 0.08 | 0.01 | 0.02 | 0.06 | 1.07 |
| | Median | 31.50 | 7.34 | 943.00 | 2.92 | 65.00 | 27.80 | 97.20 | 10.90 | 63.00 | 185.00 | 256.00 | 29.20 | 2.18 | 0.18 | 0.41 | -12.92 | -97.59 |
| Pederson's East | Average | 31.71 | 7.28 | 928.11 | 2.71 | 64.72 | 27.82 | 93.64 | 10.89 | 60.64 | 178.78 | 254.00 | 29.74 | 2.09 | 0.18 | 0.42 | -12.98 | -97.68 |
| | SD | 0.35 | 0.20 | 9.57 | 0.28 | 1.38 | 0.40 | 3.10 | 0.62 | 1.88 | 4.47 | 6.30 | 0.86 | 0.13 | 0.01 | 0.02 | 0.06 | 0.90 |
| | Median | 31.90 | 7.31 | 927.00 | 2.70 | 64.40 | 27.70 | 94.20 | 11.10 | 61.40 | 80.00 | 254.00 | 29.40 | 2.16 | 0.18 | 0.42 | -12.98 | -97.70 |
| Baldwin Spring | Average | 31.73 | 7.29 | 921.50 | 3.38 | 64.19 | 26.97 | 93.84 | 11.01 | 61.27 | 176.00 | 254.78 | 30.39 | 2.17 | 0.17 | 0.44 | -12.97 | -97.56 |
| | SD | 0.60 | 0.20 | 9.93 | 1.09 | 2.70 | 1.85 | 3.90 | 0.65 | 2.11 | 3.35 | 6.00 | 1.29 | 0.05 | 0.01 | 0.02 | 0.05 | 1.10 |
| | Median | 31.90 | 7.32 | 918.00 | 2.83 | 63.50 | 27.40 | 95.00 | 11.20 | 61.40 | 176.00 | 254.00 | 29.60 | 2.18 | 0.17 | 0.44 | -12.95 | -98.00 |
| Jones Spring Pumphouse | Average | 31.23 | 7.31 | 925.33 | 4.03 | 63.53 | 27.34 | 93.66 | 10.86 | 62.06 | 177.43 | 256.29 | 30.01 | 2.11 | 0.18 | 0.43 | -13.04 | -97.97 |
| | SD | 1.79 | 0.15 | 10.17 | 0.67 | 0.65 | 0.23 | 4.17 | 0.69 | 0.75 | 2.30 | 5.91 | 1.03 | 0.11 | 0.01 | 0.02 | 0.06 | 0.50 |
| | Median | 31.70 | 7.35 | 922.50 | 3.90 | 63.70 | 27.30 | 95.00 | 11.10 | 62.10 | 178.00 | 254.00 | 29.50 | 2.18 | 0.18 | 0.43 | -13.07 | -97.90 |

## BIODIVERSITY OF THE AQUATIC ORGANISMS

Benthic macroinvertebrates (BMI) were sampled in the recharge area springs and spring brooks to gain insight into relationships between spring geochemistry and the composition and structure of BMI communities. Sites that appeared unaffected by either anthropogenic (livestock grazing, recreation, surface diversion, etc.) or natural (flooding, drying, etc.) disturbances were selected to minimize the potential influence of these factors on BMI communities. Some of these influences were not apparent when the study was initiated, which required changing the sites sampled early in the study. Deer Spring and Water Canyon Spring were sampled once because they dried in 2004. An unnamed spring in the Egan Range was also sampled only once because of a similar disturbance. Upper Riggs Spring was sampled only twice because it was scoured by a flood early in 2004. Grapevine Spring sampling was initiated to replace the sampling of Upper Riggs Spring. A total of 10 springs were sampled from 2003 to 2005, which included 22 composited samples that were collected from all habitat types along spring brooks from their source to terminus using a D-frame net (Table 3). Samples were preserved in 90-percent ethyl alcohol and returned to the DRI Aquatic Ecology Laboratory for processing and identification. Laboratory procedures followed QA/QC bioassessment protocols to identify 300 randomly selected individuals for community assessments. The number of taxa occurring in samples ranged from 4 to 31, with the lowest values occurring in Upper Riggs Spring following its disturbance by a scouring flood. A total of 44 taxa represented more than five percent of the community in a single spring (Tables 4 through 8). Midges (Family Chironomidae) dominated most communities, followed by Baetid mayflies, amphipods, and ostracods. Taxa and the number of individuals within each taxon are shown in Appendix D.

Table 3. Springs where macroinvertebrates were collected during 2003, 2004, 2005, and 2006 (2006 samples not processed for inclusion in this report). Sample seasons abbreviated as SU = summer, AU = autumn.

| Spring | Mountain Range | Sample Years and Seasons |
|---|---|---|
| Deer Spring | White Pine | AU03 |
| White River Source (WR-1) | White Pine | AU03, SU04, SU05, AU05 |
| Unnamed Spring | Egan | AU03 |
| Water Canyon Spring | Egan | AU03 |
| Upper Riggs Spring (WR-4) | Delamar | AU03, SU04 |
| Upper Terrace Spring (WR-2) | Egan | SU04, SU05, AU05 |
| Kalamazoo Spring (WR-6) | Schell Creek | SU04, SU05, AU05 |
| Headwater Spring (WR-5) | Wilson Creek | SU04, SU05, AU05 |
| Patterson Pass Spring (WR-3) | Schell Creek | SU04, SU05, AU05 |
| Grapevine Spring (WR-7) | Meadow Valley | AU05, AU06 |

Table 4. Macroinvertebrate taxa representing more than five percent of the benthic community in Deer Spring and the White River source spring (WR-1) during sample collection in 2003, 2004, and 2005. Sample period abbreviations are as described in Table 3. A complete list of taxa in each spring is shown in Appendix D.

| | Deer Spring | Spring at White River Source (WR-1) | | | |
|---|---|---|---|---|---|
| Mountain Range | White Pine | White Pine | | | |
| Sample Time | AU03 | AU03 | SU04 | SU05 | AU05 |
| Sample Size | 205 | 282 | 591 | 318 | 308 |
| TAXA | | | | | |
| *Ameletus* | | 5 | | | |
| *Baetis* | | 37.6 | 7.8 | | |
| *Baetis tricaudatus* | | | | | 6.8 |
| *Diamesa* | | | 14 | 5.8 | |
| *Crictopus/Orthocladius* | | | | | |
| *Eukiefferiella* | | | 6.9 | | |
| *Eukiefferiella* (Brehmi Gr) | | 15.6 | | | |
| *Eukiefferiella* (Gracei Gr) | | | 15.2 | | 33.1 |
| *Tventia* | | | 34.9 | | |
| *Boreochlus* | | | 5.9 | | |
| *Radotanypus* | 7.3 | | | | |
| *Tanytarsus* | 9.3 | | | | |
| Orthoclidiinae | | | | 8 | 24.4 |
| Cypridinae | 43.4 | 14.9 | | | 28.2 |
| Cypridosidae | | | | 58.4 | |
| *Pisidium* | 11.7 | | | | |
| Planariidae | | 9.2 | | | |
| Naididae | 12.7 | | | | |

Table 5. Macroinvertebrate taxa representing more than five percent of the benthic community in an unnamed spring in the Egan Mountains, Water Canyon Spring, and Grapevine Spring (WR-7) during sample collection in 2003, 2004, and 2005. Sample period abbreviations are as described in Table 3. A complete list of taxa in each spring is shown in Appendix D.

| | Unnamed Spring | Water Cyn. Spring | Grapevine Spring (WR-7) |
|---|---|---|---|
| Mountain Range | Egan | Egan | Delamar |
| Sample Time | AU03 | AU03 | AU05 |
| Sample Size | 256 | 57 | 365 |
| TAXA | | | |
| *Baetis* | 14.8 | 7 | |
| Limnephillidae | | 7 | |
| *Eukiefferiella* (Claripennis Gr) | | 5.3 | |
| *Eukiefferiella* (Rectangularis Gr) | | 7 | |
| Coenagrionidae | | | 23 |
| Candonidae | | | 55.3 |
| *Hyalella* | 59.8 | | |
| Nematoda | 5.5 | 19.3 | 6.8 |
| Tubificidae | | 40.4 | |

Table 6. Macroinvertebrate taxa representing more than five percent of the benthic community in Upper Riggs Spring (WR-4), and WR-2 Spring during sample collection in 2003, 2004, and 2005. Sample period abbreviations are as described in Table 3. A complete list of taxa in each spring is shown in Appendix D.

| | Upper Riggs Spring (WR-4) | | WR-2 Spring | | |
|---|---|---|---|---|---|
| Mountain Range | Delamar | | Egan | | |
| Sample Time | AU03 | SU04 | SU04 | SU05 | AU05 |
| Sample Size | 11 | 625 | 307 | 321 | 350 |
| TAXA | | | | | |
| *Baetis* | | 6.9 | | | |
| *Baetis tricaudatus* | | | | | 20 |
| *Fallceon quilleri* | | 5 | | | |
| *Cheumatopsyche* | | 5.1 | | | |
| *Paramtrichonemus/Parahaenocladius* | | 5.8 | | | |
| *Microspectra* | | 5.4 | | | |
| *Tanytarsus* | | 5.4 | | | |
| *Rheotanytarsus* | | 18.6 | | | |
| Candonidae | | 7.8 | | | |
| Cypridinae | 63.6 | | 63.5 | | 19.1 |
| Cypridosidae | | | | 46.4 | |
| *Hyalella* | | | 18.2 | 34.6 | 44.3 |
| *Physa* | 18.1 | | | | |
| Naididae | 9 | 6.7 | | | |

Table 7. Macroinvertebrate taxa representing more than five percent of the benthic community at Kalamazoo Spring (WR-6) and Headwater Spring (WR-5) during sample collection in 2003, 2004, and 2005. Sample period abbreviations are as described in Table 3. A complete list of taxa in each spring is shown in Appendix D.

| | Kalamazoo Spring (WR-6) | | | Headwater Spring (WR-7) | | |
|---|---|---|---|---|---|---|
| Mountain Range | Schell Creek | | | Wilson Creek | | |
| Sample Time | SU04 | SU05 | AU05 | SU04 | SU05 | AU05 |
| Sample Size | 308 | 283 | 349 | 596 | 444 | 318 |
| TAXA | | | | | | |
| *Baetis* | 7.1 | | | 13.9 | | |
| *Magnus* | | | | | 22.5 | 66 |
| *Micrasema* | | 7.8 | 13.5 | | | |
| *Lepidostoma* | 7 | 7.4 | 21.8 | | | |
| *Heterlimnius* | 8.8 | | 15.5 | | | |
| *Crictopus/Orthocladius* | | | | 6.5 | | |
| *Eukiefferiella* (Gracei Gr) | | 26.1 | 23.4 | | | |
| *Microspectra* | | | | | 11.5 | |
| *Radotanypus* | | | | 6 | | |
| *Simulium* | | | | 20.8 | | |
| Cypridosidae | | | | 11.3 | | 6 |
| *Hyalella* | 50 | 21.9 | 6.6 | | | |
| Naididae | | | | 32.2 | 47.3 | 14.8 |
| Elmidae (ND) | 8.8 | | | | | |

Table 8. Macroinvertebrate taxa representing more than five percent of the benthic community in Patterson Pass Spring (WR-3) during sample collection in 2003, 2004, and 2005. Sample period abbreviations are as described in Table 3. A complete list of taxa in each spring is shown in Appendix D.

| | Patterson Pass Spring (WR-3) | | |
|---|---|---|---|
| Mountain Range | Schell Creek | | |
| Sample Time | SU04 | SU05 | AU05 |
| Sample Size | 568 | 366 | 251 |
| TAXA | | | |
| *Baetis* | 9.5 | | |
| *Ochritrichia* | 10.9 | | |
| *Culicoides* | | | 7.2 |
| *Tventia* | 16.7 | 38.3 | 13.5 |
| *Tanytarsus* | 10.6 | | 9.6 |
| Orthoclidiinae | 5.6 | 6.6 | |
| *Simulium* | 6.5 | | |
| *Pisidium* | 14.6 | 36.4 | 49.8 |

## REFERENCES


Thomas, J.M. S.C., Calhous, and W.B. Apambire, 2001. A deuterium mass-balance interpretation of groundwater sources and flows in southeastern Nevada. Desert Research Institute, Division of Hydrologic Sciences Publication No. 41169, 46 p.

Thomas, J.M., T. Mihevc, D. Sada, and E. Sawyer, 2004. Annual Data Report for Geochemical Monitoring and Interpretation for Water Budget Development for the White River and Meadow Valley Wash Regional Groundwater Flow Systems. Desert Research Institute Letter Report.

Thomas, J.M., T. Mihevc, D. Sada, and E. Sawyer, 2005. Annual Data Report for Geochemical Monitoring and Interpretation for Water Budget Development for the White River and Meadow Valley Wash Regional Groundwater Flow Systems. Desert Research Institute Letter Report.

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**APPENDIX A. Physical, Water Chemistry, and Isotopic Data for Springs in Recharge Areas of the White River and Meadow Valley Wash Regional Groundwater Flow Systems and Spring and Snake Valleys**

Table A-1. Location and field parameters for springs in recharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter).

| Recharge Area and Site | Reference Site | DRI Lab # | Site Name | Sample Date | Sample Time | Latitude dec deg | Longitude dec deg | Altitude (ft) | Flow (gpm) | Water Temp (˚C) | pH (field) | EC (field) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antelope Range | | | | | | | | | | | | |
| AR-1 | 395 | 63276 | Tippet Spring | 08/24/2005 | 9:30 | 39.876915 | 114.373480 | 6,235 | 150 | 21.4 | 6.8 | 495 |
| AR-2 | 396 | 63277 | Unnamed Spring #8 | 08/24/2005 | 13:00 | 39.987784 | 114.433412 | 7,779 | 1 | 9.2 | 6.13 | 283 |
| AR-3 | 397 | 63278 | Unnamed Spring #9 | 08/25/2005 | 9:45 | 39.993636 | 114.420708 | 7,931 | 3 | 8.3 | 6.16 | 255 |
| AR-4 | 398 | 63279 | Unnamed Spring #10 | 08/25/2005 | 12:00 | 39.937971 | 114.360742 | 6,650 | 7 | 12.9 | 6.59 | 894 |
| AR-5 | 399 | 63280 | Dipping Tank Spring | 08/25/2005 | 14:15 | 39.775222 | 114.475117 | 7,025 | 22 | 12 | 6.83 | 358 |
| AR-6 | 400 | 63281 | Rock Springs | 08/25/2005 | 16:00 | 39.859787 | 114.472767 | 7,480 | 20 | 9.4 | 6.05 | 342 |
| Buck Mountains | | | | | | | | | | | | |
| BK-1 | 339 | 62705 | Mud Spring | 06/05/2005 | 9:10 | 39.73587 | 115.57036 | 7,039 | 3.0 | 11.6 | 6.9 | 781 |
| BK-2 | 356 | 62706 | Woodchuck Spring | 06/05/2005 | 10:10 | 39.72453 | 115.57297 | 7,165 | 7.0 | 7.5 | 6.8 | 723 |
| BK-3 | 351 | 62707 | Unnamed Near Little Willow Spring | 06/05/2005 | 11:30 | 39.72235 | 115.60986 | 7,937 | 3.0 | 9.4 | 7.2 | 206 |
| Butte Mountains | | | | | | | | | | | | |
| BT-1 | 327 | 62619 | Butte Spring | 05/24/2005 | 9:45 | 39.75816 | 115.24246 | 6,857 | 1.0 | 13.7 | 6.9 | 423 |
| BT-2 | 343 | 62628 | Sammy Spring | 05/24/2005 | 18:40 | 39.43597 | 115.32453 | 6,676 | 10.0 | 11.6 | 6.9 | 341 |
| BT-3 | 355 | 62631 | White Rock Spring | 05/24/2005 | 14:38 | 40.06079 | 115.16385 | 7,094 | - | 9.4 | 6.4 | 327 |
| BT-4 | 348 | 62702 | Summit Spring | 06/04/2005 | 13:30 | 39.55109 | 115.23000 | 7,199 | 10.0 | 7.7 | 6.5 | 420 |
| BT-5 | 340 | 62703 | Robbers Roost No. 2 Spring | 06/04/2005 | 15:20 | 39.49596 | 115.28046 | 7,119 | 22.0 | 12.7 | 6.2 | 199 |
| BT-6 | 332 | 62704 | Deer Spring | 06/04/2005 | 17:51 | 39.48683 | 115.27559 | 7,073 | 3.0 | 12.3 | 6.3 | 390 |
| BT-7 | 328 | 62708 | Cabin Spring | 06/05/2005 | 13:45 | 39.75790 | 115.27245 | 6,977 | 3.0 | 11.0 | 7.0 | 541 |
| BT-8 | 334 | 62709 | Indian Spring | 06/05/2005 | 15:00 | 39.44040 | 115.31884 | 6,751 | 10.0 | 11.3 | 7.1 | 320 |
| Cherry Creek Range | | | | | | | | | | | | |
| CC-1 | 335 | 62625 | Johnson Spring | 05/24/2005 | 11:11 | 39.92319 | 114.98923 | 6,820 | -- | 10.2 | 7.5 | 641 |
| CC-2 | 345 | 62629A | Snow Creek Spring | 05/24/2005 | 12:44 | 40.07837 | 114.91138 | 7,062 | -- | 7.9 | 7.2 | 290 |
| CC-3 | 338 | 62629B | Lower Snow Creek Spring | 05/24/2005 | 13:44 | 40.07837 | 114.91138 | | | | | |
| Clover Mountains | | | | | | | | | | | | |
| CR-1 | 246 | 58500 | Garden Spring | 01/15/2004 | 16:00 | 37.26425 | 114.28869 | 4,800 | < 0.1 | 8.8 | 7.1 | 1,033 |
| CR-2 | 249 | 58501 | Unnamed Spring (Clover) | 01/15/2004 | 17:00 | 37.27654 | 114.30744 | 5,000 | 0.1 | 3.3 | 7.1 | 885 |
| CR-3 | 250 | 59701 | Kershaw-Ryan Spring #1 | 03/27/2004 | 10:00 | 37.59028 | 114.52010 | 4,400 | 0.5 | 20.0 | 8.4 | 249 |
| CR-4 | 251 | 59702 | Ella Spring | 03/27/2004 | 18:00 | 37.49251 | 114.44790 | 6,000 | 2.0 | 7.5 | 7.7 | 269 |
| CR-5 | 252 | 61102 | Unnamed Spring nr Clover Creek | 07/31/2004 | 10:30 | 37.61461 | 114.45061 | 4,558 | -- | 16.2 | 7.0 | 520 |
| CR-6 | 253 | 61094 | Big Spring | 07/31/2004 | 12:50 | 37.52781 | 114.35258 | 5,050 | 30.0 | 17.2 | 7.3 | 218 |
| CR-6 | 253 | 62401 | Big Spring | 04/30/2005 | 8:00 | 37.52781 | 114.35258 | 5,050 | ~30 | 17.0 | 7.4 | 233 |
| CR-7 | 254 | 61096 | Little Springs | 07/31/2004 | 13:45 | 37.53469 | 114.35616 | 5,021 | 15.0 | 18.5 | 7.6 | 237 |

Table A-1. Location and field parameters for springs in recharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter) (continued).

| Recharge Area and Site | Reference Site | DRI Lab # | Site Name | Sample Date | Sample Time | Latitude dec deg | Longitude dec deg | Altitude (ft) | Flow (gpm) | Water Temp (˚C) | pH (field) | EC (field) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CR-7 | 254 | 62403 | Little Springs | 04/30/2005 | 8:50 | 37.53469 | 114.35616 | 5,021 | 20 + | 17.1 | 6.8 | 228 |
| CR-8 | 255 | 61100 | Quaking Aspen Spring | 07/31/2004 | 18:14 | 37.37563 | 114.24255 | 6,401 | < 0.1 | 9.6 | 6.2 | 140 |
| CR-9 | 108 | 61097 | Sheep Spring | 07/31/2004 | 20:00 | 37.40063 | 114.27779 | 6,030 | 0.4 | 18.5 | 6.9 | 253 |
| CR-10 | 247 | 61101 | Cave Spring | 07/31/2004 | 15:40 | 37.52979 | 114.24092 | 5,428 | 24.9 | 18.7 | 7.0 | 414 |
| CR-11 | 247 | 61101B | Cave Spring | 07/31/2004 | 15:40 | 37.52979 | 114.24094 | 5,428 | 24.9 | 18.7 | 7.0 | 414 |
| CR-12 | 248 | 61100B | East Settling Spring | 07/31/2004 | 18:00 | 37.37315 | 114.23282 | -- | < 0.1 | -- | -- | -- |
| Delamar Mountains | | | | | | | | | | | | |
| DR-1 | 256 | 58495 | Red Rock Spring | 01/10/2004 | 15:00 | 37.56516 | 114.75170 | 6,100 | < 0.1 | 10.0 | 7.3 | 596 |
| DR-2 | 92 | 58489 | Willow Spring (KSV-1) | 01/12/2004 | 15:00 | 37.09483 | 114.83096 | 3,500 | -- | 9.3 | 7.5 | 369 |
| DR-2 | 92 | 62395 | Willow Spring (KSV-1) | 04/27/2005 | -- | 37.09483 | 114.83096 | 3,500 | 0.2 | 16.7 | 7.4 | 384 |
| DR-3 | 98 | 58491 | Boulder Spring (KSV-4) | 01/13/2004 | 14:00 | 37.31455 | 114.67255 | 5,084 | -- | 5.0 | 7.4 | 179 |
| DR-3 | 98 | 62394 | Boulder Spring (KSV-4) | 04/27/2005 | -- | 37.31455 | 114.67255 | 5,084 | ~ 50 | 13.6 | 7.6 | 175 |
| DR-4 | 97 | 58490 | Kane Springs (KSV-3) | 01/13/2004 | 16:00 | 37.24928 | 114.70916 | 4,275 | 1.0 | 14.8 | 7.0 | 436 |
| DR-5 | 105 | 58492 | Upper Riggs Spring WR-4 | 01/13/2004 | 10:00 | 37.36833 | 114.64778 | 5,163 | 30.0 | 10.1 | 7.3 | 494 |
| DR-5 | 105 | 60082 | Upper Riggs Spring WR-4 | 04/29/2004 | 12:05 | 37.36833 | 114.64778 | 5,163 | 30.0 | 16.9 | 8.0 | 452 |
| DR-5 | 105 | 61614 | Upper Riggs Spring WR-4 | 10/19/2004 | 15:20 | 37.36833 | 114.64778 | 5,163 | -- | 13.2 | 7.4 | 477 |
| DR-5 | 105 | 62035 | Upper Riggs Spring WR-4 | 02/10/2005 | 14:37 | 37.36833 | 114.64778 | 5,163 | -- | 6.0 | 7.1 | 270 |
| DR-5 | 105 | 62635A | Upper Riggs Spring WR-4 | 05/19/2005 | 10:15 | 37.36833 | 114.64778 | 5,163 | -- | 11.2 | 6.8 | 376 |
| DR-6 | 107 | 58493 | Bishop Spring | 01/14/2004 | 14:15 | 37.31444 | 114.67239 | 5,632 | 0.8 | 17.5 | 7.0 | 557 |
| DR-6 | 107 | 62618 | Bishop Spring | 05/20/2005 | 9:30 | 37.31444 | 114.67239 | 5,632 | -- | 18.4 | 6.9 | 558 |
| DR-7 | 267 | 58498 | Lower Indian Spring | 01/14/2004 | 16:30 | 37.45006 | 114.65730 | 5,846 | 0.1 | 21.4 | 8.3 | 389 |
| DR-8 | 268 | 58499 | Upper Indian Spring | 01/14/2004 | 17:00 | 37.45202 | 114.65831 | 5,846 | -- | 11.7 | 7.3 | 541 |
| DR-9 | 269 | 58502 | Oak Spring | 01/16/2004 | 12:00 | 37.60547 | 114.71015 | 4,729 | -- | 10.5 | 7.1 | 632 |
| DR-10 | 257 | 59683 | Narrow Spring | 03/22/2004 | 11:50 | 37.36729 | 114.67807 | 6,200 | 0.1 | 9.9 | 7.2 | 451 |
| DR-11 | 258 | 59684 | Sawmill Spring West | 03/22/2004 | 14:20 | 37.36734 | 114.69749 | 6,200 | < 0.1 | 9.7 | 6.5 | 252 |
| DR-12 | 259 | 59685 | Sawmill Spring | 03/22/2004 | 15:30 | 37.36762 | 114.69708 | 6,200 | 1.0 | 10.3 | 6.9 | 409 |
| DR-13 | 260 | 59693 | Willow Spring 2 (So. of Oak Spring summit) | 03/25/2004 | 13:00 | 37.55653 | 114.69773 | 6,400 | 0.1 | 13.7 | 7.4 | 479 |
| DR-14 | 261 | 59694 | Lower Chokecherry Spring | 03/25/2004 | 16:30 | 37.53721 | 114.69709 | 6,400 | 0.3 | 6.4 | 7.7 | 539 |
| DR-15 | 262 | 59695 | Upper Chokecherry Spring | 03/25/2004 | 17:00 | 37.53746 | 114.69833 | 6,400 | 0.3 | 9.3 | 8.0 | 406 |
| DR-16 | 263 | 59696 | Unnamed Chokecherry Spring | 03/25/2004 | 18:00 | 37.53905 | 114.70312 | 6,500 | -- | 11.8 | 7.2 | 165 |
| DR-17 | 264 | 59697 | Buckboard Spring | 03/26/2004 | 10:00 | 37.58886 | 114.63111 | 5,500 | < 0.1 | 14.7 | 7.7 | 350 |
| DR-18 | 265 | 59698 | Cottonwood Spring | 03/26/2004 | 14:00 | 37.53453 | 114.74478 | 6,750 | 2.0 | 15.5 | 7.1 | 554 |
| DR-19 | 266 | 59699 | Abandoned Spring | 03/26/2004 | 16:30 | 37.49914 | 114.72889 | 6,600 | < 0.1 | 10.2 | 7.8 | 709 |
| DR-20 | 117 | 59700 | Grassy Spring | 03/26/2004 | 17:50 | 37.54108 | 114.79223 | 5,700 | 1.0 | 14.2 | 7.5 | 801 |
| DR-20 | 117 | 62402 | Grassy Spring | 04/27/2005 | 1:00 | 37.54108 | 114.79223 | 5,700 | 17.5 | 13.6 | 7.0 | 712 |

Table A-1. Location and field parameters for springs in recharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter) (continued).

| Recharge Area and Site | Reference Site | DRI Lab # | Site Name | Sample Date | Sample Time | Latitude dec deg | Longitude dec deg | Altitude (ft) | Flow (gpm) | Water Temp (˚C) | pH (field) | EC (field) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Egan Range | | | | | | | | | | | | |
| ER-1 | 270 | 57696 | Upper Terrace Spring WR-2 | 10/13/2003 | 14:16 | 39.08664 | 114.92565 | 8,747 | 2.0 | -- | -- | -- |
| ER-1 | 270 | 57697 | Upper Terrace Spring WR-2 | 10/15/2003 | 11:30 | 39.08664 | 114.92565 | 8,747 | 2.0 | 8.2 | 7.1 | 280 |
| ER-1 | 270 | 60080 | Upper Terrace Spring WR-2 | 04/26/2004 | 14:14 | 39.08664 | 114.92565 | 8,747 | -- | 7.6 | 7.9 | 277 |
| ER-1 | 270 | 60785 | Upper Terrace Spring WR-2 | 06/23/2004 | 15:00 | 39.08664 | 114.92565 | 8,747 | -- | 8.0 | 7.5 | 291 |
| ER-1 | 270 | 61479 | Upper Terrace Spring WR-2 | 09/22/2004 | 9:36 | 39.08664 | 114.92565 | 8,747 | -- | 8.2 | 6.9 | 283 |
| ER-1 | 270 | 62030 | Upper Terrace Spring WR-2 | 02/09/2005 | 13:07 | 39.08664 | 114.92565 | 8,747 | -- | 7.2 | 7.8 | 278 |
| ER-1 | 270 | 62633A | Upper Terrace Spring WR-2 | 05/21/2005 | 12:30 | 39.08664 | 114.92565 | 8,747 | -- | -- | -- | -- |
| ER-1 | 270 | 63219 | Upper Terrace Spring WR-2 | 08/11/2005 | 16:15 | 39.08664 | 114.92565 | 8,747 | -- | 8.00 | 6.98 | 282 |
| ER-1 | 270 | 63562 | Upper Terrace Spring WR-2 | 11/6/2005 | 8:09 | 39.08664 | 114.92565 | 8,747 | -- | 7.7 | 7.77 | 277 |
| ER-2 | 233 | 57695 | Water Canyon Spring | 10/14/2003 | 14:55 | 39.00691 | 114.91063 | 7,660 | 50.0 | 8.9 | 7.3 | 377 |
| ER-3 | 223 | -- | Lone Pine Spring | 10/13/2003 | 9:20 | 38.89567 | 114.90003 | 8,126 | 0.5 | -- | -- | -- |
| ER-4 | 206 | -- | Big Spring | 10/14/2003 | 11:01 | 38.59917 | 114.91665 | 7,000 | 5.0 | 13.0 | 6.5 | 268 |
| ER-4 | 206 | 62980 | Big Spring | 07/31/2005 | 17:30 | 38.59917 | 114.91665 | 7,000 | 100 | 12.9 | 6.11 | 259 |
| ER-5 | 271 | -- | Water Canyon at USGS gage | 10/24/2003 | 12:40 | 38.98877 | 114.95503 | 7,660 | -- | -- | -- | -- |
| ER-5 | 271 | -- | Water Canyon at USGS gage (duplicate sample) | 10/24/2003 | 12:40 | 38.98877 | 114.95503 | 7,660 | -- | -- | -- | -- |
| ER-6 | 353 | 62630 | Unnamed Spring 1 | 05/24/2005 | 7:31 | 39.50919 | 114.99298 | 7,227 | -- | -- | -- | -- |
| ER-7 | 385 | 62975 | Silver Spring | 07/29/2005 | 15:45 | 38.81085 | 114.88121 | 7,519 | 150 | 9.3 | 6.72 | 425 |
| ER-8 | 386 | 62977 | Hole in the Bank Spring | 07/31/2005 | 8:00 | 38.84915 | 114.89566 | 7,869 | 7 | 6.9 | 6.64 | 324 |
| ER-9 | 387 | 62979 | Haggerty Spring | 07/31/2005 | 14:45 | 38.66930 | 114.90482 | 7,106 | 2400 | 11.9 | 6.85 | 411 |
| ER-10 | 408 | 63531 | Perry Spring | 10/28/2005 | 14:00 | 38.33285 | 114.97586 | 6,513 | 5 | 12.1 | 7.06 | 597 |
| Fortification Range | | | | | | | | | | | | |
| FO-1 | 375 | 62974 | Indian Springs | 07/29/2005 | 10:00 | 38.641600 | 114.449570 | 6,358 | 15 | 14.1 | 6.79 | 220 |
| Fairview Range | | | | | | | | | | | | |
| FR-1 | 272 | 60846 | Scotty Spring | 06/26/2004 | 14:35 | 38.16479 | 114.68374 | 6,278 | 0.8 | 14.2 | 7.1 | 516 |
| FR-2 | 275 | 60847 | Littlefield Spring | 06/26/2004 | 17:30 | 38.23125 | 114.70223 | 6,160 | 0.2 | 14.9 | 7.0 | 491 |
| FR-3 | 276 | 60845 | Meloy Spring | 06/26/2004 | 19:20 | 38.25181 | 114.70497 | 6,105 | 2.4 | 14.4 | 7.2 | 499 |
| FR-4 | 323 | 60845A | McDermitt Spring | 06/26/2004 | 20:04 | 38.25914 | 114.63164 | 6,498 | < 1 | -- | -- | -- |
| FR-5 | 277 | 60849 | Bailey Spring | 06/29/2004 | 13:30 | 38.17593 | 114.72829 | 5,980 | < 0.1 | 18.9 | 7.8 | 697 |
| FR-5 | 277 | 62407 | Bailey Spring | 05/01/2005 | 15:30 | 38.17593 | 114.72829 | 5,980 | 10.0 | 10.7 | 7.0 | 807 |
| FR-6 | 278 | 62407A | Fence Spring | 06/29/2004 | 15:15 | 38.17978 | 114.71593 | 6,226 | < 1 | -- | -- | -- |
| FR-7 | 279 | 62407B | Robinson Spring | 06/29/2004 | 16:45 | 38.21273 | 114.70636 | 6,202 | < 0.1 | -- | -- | -- |
| FR-8 | 280 | 60850 | Upper Fairview | 06/29/2004 | 18:30 | 38.18657 | 114.66620 | 6,415 | < 1 | 18.0 | 7.2 | 491 |
| FR-9 | 281 | -- | Lower Fairview | 06/29/2004 | 19:10 | 38.17573 | 114.65551 | 6,240 | < 1 | -- | -- | -- |
| FR-10 | 273 | -- | Fox Cabin | 06/29/2004 | 19:40 | 38.16267 | 114.65034 | 6,124 | -- | -- | -- | -- |
| FR-11 | 274 | 60848 | Cottonwood Spring | 06/29/2004 | 20:40 | 38.31102 | 114.63460 | 6,700 | < 0.1 | 13.1 | -- | -- |

Table A-1. Location and field parameters for springs in recharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter) (continued).

| Recharge Area and Site | Reference Site | DRI Lab # | Site Name | Sample Date | Sample Time | Latitude dec deg | Longitude dec deg | Altitude (ft) | Flow (gpm) | Water Temp (˚C) | pH (field) | EC (field) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grant Range | | | | | | | | | | | | |
| GR-1 | 282 | 57754 | Brady Spring | 10/28/2003 | 11:00 | 38.32746 | 115.47509 | 8,431 | < 0.2 | 10.3 | -- | 435 |
| GR-1 | 282 | 57754 | Brady Spring (duplicate sample) | 10/28/2003 | 11:00 | 38.32746 | 115.47509 | 8,431 | -- | -- | -- | -- |
| GR-2 | 369 | 62828 | Little Spring | 06/30/2005 | 12:20 | 38.33197 | 115.36050 | 5,836 | 2.5 | 14.7 | 6.90 | 491 |
| GR-3 | 370 | 62829 | Horse Spring | 06/30/2005 | 13:00 | 38.32951 | 115.38580 | 6,219 | 10.0 | 14.7 | 7.10 | 438 |
| GR-4 | 371 | 62830 | Teaspoon Spring | 06/30/2005 | 14:20 | 38.34509 | 115.41189 | 6,654 | <0.1 | 11.9 | 7.00 | 651 |
| GR-5 | 372 | 62831 | Wiregrass Spring | 06/30/2005 | 15:30 | 38.35211 | 115.42693 | 6,873 | 3.0 | 14.3 | 7.50 | 818 |
| GR-6 | 373 | 62833 | Murphy Spring | 07/02/2005 | 12:21 | 38.33973 | 115.44937 | 7,243 | 11.0 | 10.6 | 6.70 | 362 |
| Highland Range | | | | | | | | | | | | |
| HR-1 | 163 | 60839 | Highland Spring | 06/24/2004 | 13:32 | 37.92126 | 114.54857 | 6,800 | 0.5 | 11.6 | 7.4 | 612 |
| HR-1 | 163 | 62408 | Highland Spring | 05/01/2005 | 7:30 | 37.92126 | 114.54857 | 6,800 | 100 | 10.2 | 6.8 | 612 |
| HR-2 | 162 | 60837 | Deadman Spring | 06/24/2004 | 14:30 | 37.91854 | 114.54147 | 6,900 | < 1 | 27.9 | 9.7 | 311 |
| HR-3 | 160 | 60840 | Lime Spring | 06/24/2004 | 15:48 | 37.91467 | 114.54022 | 6,800 | < 0.1 | 15.1 | 7.4 | 635 |
| HR-4 | 157 | -- | Pine Spring | 06/24/2004 | 17:45 | 37.90810 | 114.55165 | 7,282 | < 1 | -- | -- | -- |
| HR-5 | 283 | 60838 | Connor Spring | 06/24/2004 | 18:30 | 37.90165 | 114.56023 | 7,800 | 1.6 | 8.4 | 7.7 | 513 |
| HR-6 | 156 | 60836 | Big Trees Spring | 06/24/2004 | 18:46 | 37.90282 | 114.56091 | 7,700 | 1.5 | 9.2 | 7.7 | 539 |
| Indian Peak Range | | | | | | | | | | | | |
| IP-1 | 410 | 63596 | Ryans Spring D 38 | 11/19/2005 | 9:10 | 38.331207 | 113.928551 | 7,276 | 30 | 7.8 | 7.07 | 565 |
| IP-2 | 411 | 63597 | Merril's Camp D 39 | 11/19/2005 | 12:22 | 38.188250 | 113.866363 | 8,152 | 50 | 8.2 | 7.21 | 270 |
| Kern Mountains Range | | | | | | | | | | | | |
| KM-1 | 391 | 63272 | Mike's Spring | 8/23/2005 | 8:30 | 39.64370 | 114.20490 | 7,230 | 30 | 10.7 | 6.77 | 559 |
| KM-2 | 392 | 63273 | Unnamed Spring #7 | 8/23/2005 | 10:30 | 39.68222 | 114.19140 | 7,870 | 12 | 10.2 | 6.32 | 423 |
| KM-3 | 393 | 63274 | Grass Valley Springs | 8/23/2005 | 13:30 | 39.71321 | 114.23300 | 8,417 | 20 | 9.2 | 6.35 | 166.7 |
| KM-4 | 394 | 63275 | Cedar Spring | 8/23/2005 | 16:45 | 39.77309 | 114.21140 | 6,835 | 70 | 14.4 | 7.2 | 917 |
| Mountain Home Range | | | | | | | | | | | | |
| MH-1 | 378 | 62971 | Cobb Spring | 07/28/2005 | 14:25 | 38.54187 | 113.98651 | 7,527 | 35 | 11.7 | 7.31 | 790 |
| Mount Irish Range | | | | | | | | | | | | |
| MI-1 | 286 | 60844 | Littlecut Spring | 06/25/2004 | 11:30 | 37.69642 | 115.37805 | 6,412 | 0.1 | -- | -- | -- |
| MI-1 | 286 | 62410 | Littlecut Spring | 05/02/2005 | 9:14 | 37.69642 | 115.37805 | 6,412 | 0.5 | 10.4 | 6.8 | 577 |
| MI-2 | 287 | 62410A | Henry Spring | 06/25/2004 | 12:15 | 37.68990 | 115.37391 | 6,660 | < 0.1 | -- | -- | -- |
| MI-3 | 288 | 60841 | Cold Spring | 06/25/2004 | 13:00 | 37.71370 | 115.41016 | 6,306 | 0.1 | -- | -- | -- |
| MI-4 | 289 | 60843 | Reed Spring | 06/25/2004 | 15:30 | 37.55731 | 115.41800 | 6,967 | 0.17 | -- | -- | -- |
| Meadow Valley Mountains | | | | | | | | | | | | |
| MM-1 | 93 | 62396 | Grapevine Spring | 04/27/2005 | 15:00 | 37.12957 | 114.70963 | 3,649 | 15.0 | 18.2 | 7.6 | 583 |
| MM-1 | 93 | 63223 | Grapevine Spring WR-7 | 08/16/2005 | 10:40 | 37.12957 | 114.70963 | 3,649 | -- | 20.6 | 6.81 | 595 |

Table A-1. Location and field parameters for springs in recharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter) (continued).

| Recharge Area and Site | Reference Site | DRI Lab # | Site Name | Sample Date | Sample Time | Latitude dec deg | Longitude dec deg | Altitude (ft) | Flow (gpm) | Water Temp (˚C) | pH (field) | EC (field) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MM-1 | 93 | 63573 | Grapevine Spring WR-7 | 11/9/2005 | 11:55 | 37.12957 | 114.70963 | 3,649 | -- | 18.3 | 7.71 | 565 |
| MM-1 | 93 | 64171 | Grapevine Spring WR-7 | 2/16/2006 | 15:00 | 37.12957 | 114.70963 | 3,649 | -- | 12.1 | 7.5 | 558 |
| Pahroc Ranges | | | | | | | | | | | | |
| PR-1 | 131 | 58494 | Pahroc Spring | 01/16/2004 | 14:00 | 37.66424 | 114.98085 | 5,400 | 0.1 | 14.4 | 7.4 | 276 |
| PR-1 | 131 | 62405 | Pahroc Spring | 04/30/2005 | 14:30 | 37.66424 | 114.98085 | 5,400 | 0.2 | 16.0 | 6.6 | 281 |
| PR-2 | 298 | 59686 | Hamilton Spring | 03/23/2004 | 13:15 | 37.93572 | 114.88764 | 5,300 | 1.0 | 14.4 | 7.2 | 545 |
| PR-3 | 158 | 59687 | Blackrock Spring | 03/23/2004 | 15:00 | 37.91200 | 114.91930 | 5,500 | 2.0 | 12.1 | 7.6 | 318 |
| PR-4 | 299 | 59688 | Unnamed Spring nr Blackrock | 03/23/2004 | 4:30 | 37.91689 | 114.91859 | 5,400 | 0.1 | 9.2 | 7.4 | 416 |
| PR-5 | 323 | 59689 | Deadman Spring | 03/23/2004 | 18:00 | 37.93305 | 114.91371 | 5,400 | 5.0 | 11.6 | 7.6 | 468 |
| PR-5 | 323 | 59689 | Deadman Spring (duplicate sample) | 03/23/2004 | 18:00 | 37.93305 | 114.91371 | 5,400 | -- | -- | -- | -- |
| PR-6 | 301 | 59690 | Little Boulder Spring | 03/24/2004 | 12:30 | 37.71330 | 114.95217 | 6,000 | 5.0 | 12.0 | 7.1 | 188 |
| PR-7 | 135 | 59691 | Mustang Spring | 03/24/2004 | 12:15 | 37.73580 | 114.92050 | 5,500 | 2.0 | 13.4 | 6.8 | 618 |
| PR-8 | 302 | 59692 | Rattlesnake Spring | 03/24/2004 | 16:30 | 37.82608 | 114.93112 | 5,500 | 3.5 | 14.1 | 7.8 | 413 |
| PR-9 | 303 | 61098 | Unnamed Spring in Road | 07/30/2004 | 13:41 | 37.53638 | 115.10651 | 4,758 | < 0.1 | 28.4 | 6.4 | 351 |
| PR-10 | 294 | 61104 | Twin Spring | 07/30/2004 | 15:34 | 37.47021 | 115.02171 | 6,464 | 0.8 | 16.9 | 7.2 | 340 |
| PR-11 | 295 | 61103 | Eightmile Spring | 07/30/2004 | 19:05 | 37.46466 | 115.06440 | 5,993 | 6.3 | 17.9 | 7.2 | 340 |
| PR-11 | 295 | 62404 | Eightmile Spring | 04/30/2005 | 17:30 | 37.46466 | 115.06440 | 5,993 | 7.0 | 14.4 | 7.35 | 389 |
| PR-12 | 296 | 61106A | Unnamed Spring nr Sixmile seep | 07/30/2004 | 12:25 | 37.49680 | 115.09102 | 5,300 | -- | -- | -- | -- |
| PR-13 | 297 | 61106C | Water Tank 0.4mi West of Sixmile | 07/30/2004 | 12:50 | 37.49119 | 115.09605 | 5,172 | -- | -- | -- | -- |
| Schell Creek Range | | | | | | | | | | | | |
| SC-1 | 304 | 57756 | Spring Schell Creek 1 | 10/29/2003 | 14:10 | 38.51866 | 114.74273 | 7,048 | < 0.2 | -- | -- | -- |
| SC-1 | 304 | 57756 | Spring Schell Creek 1 (duplicate sample) | 10/29/2003 | 14:10 | 38.51866 | 114.74273 | 7,048 | -- | -- | -- | -- |
| SC-1 | 304 | 62976 | Spring Schell Creek 1 | 07/30/2005 | 12:45 | 38.518490 | 114.742410 | 7,057 | 10 | 10.7 | 7.22 | 412 |
| SC-2 | 305 | 57755 | Patterson Pass Spring WR-3 | 10/30/2003 | 10:50 | 38.60280 | 114.71488 | 7,484 | 7.8 | 12.0 | 6.6 | -- |
| SC-2 | 305 | 57755 | Patterson Pass Spring WR-3 (duplicate sample) | 10/30/2003 | 10:50 | 38.60280 | 114.71488 | 7,484 | -- | -- | -- | -- |
| SC-2 | 305 | 59579 | Patterson Pass Spring WR-3 | 03/24/2004 | 11:28 | 38.60280 | 114.71488 | 7,484 | -- | 11.8 | 6.1 | 135 |
| SC-2 | 305 | 60786 | Patterson Pass Spring WR-3 | 06/23/2004 | 8:00 | 38.60280 | 114.71488 | 7,484 | -- | 11.5 | 7.1 | 137 |
| SC-2 | 305 | 61480 | Patterson Pass Spring WR-3 | 09/23/2004 | 9:24 | 38.60280 | 114.71488 | 7,484 | -- | 12.0 | 7.5 | 130 |
| SC-2 | 305 | 61967 | Patterson Pass Spring WR-3 | 01/23/2005 | -- | 38.60280 | 114.71488 | 7,484 | -- | 11.7 | 6.8 | 141 |
| SC-2 | 305 | 62634A | Patterson Pass Spring WR-3 | 05/20/2005 | 13:00 | 38.60280 | 114.71488 | 7,484 | -- | 11.4 | 6.7 | 131 |
| SC-2 | 305 | 63220 | Patterson Pass Spring WR-3 | 08/15/2005 | 11:00 | 38.60280 | 114.71488 | 7,484 | -- | 11.70 | 6.13 | 116 |
| SC-2 | 305 | 63566 | Patterson Pass Spring WR-3 | 11/7/2005 | 15:09 | 38.60280 | 114.71488 | 7,484 | -- | 12.1 | 6.97 | 129 |
| SC-2 | 305 | 64239 | Patterson Pass Spring WR-3 | 02/26/2006 | 9:28 | 38.60280 | 114.71488 | 7,484 | -- | 11.9 | 6.52 | 131 |

Table A-1. Location and field parameters for springs in recharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter) (continued).

| Recharge Area and Site | Reference Site | DRI Lab # | Site Name | Sample Date | Sample Time | Latitude dec deg | Longitude dec deg | Altitude (ft) | Flow (gpm) | Water Temp (˚C) | pH (field) | EC (field) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SC-3 | 336 | 60962 | Kalamazoo Spring WR-6 | 07/20/2004 | 17:00 | 39.56648 | 114.59594 | 7,221 | -- | 12.1 | 7.3 | 328 |
| SC-3 | 336 | 61348A | Kalamazoo Spring WR-6 | 09/21/2004 | 11:39 | 39.56648 | 114.59594 | 7,221 | -- | 12.3 | 7.3 | 377 |
| SC-3 | 336 | 61966 | Kalamazoo Spring WR-6 | 01/23/2005 | 9:56 | 39.56648 | 114.59594 | 7,221 | -- | 11.9 | 7.4 | 351 |
| SC-3 | 336 | 62636A | Kalamazoo Spring WR-6 | 05/23/2005 | 9:27 | 39.56648 | 114.59594 | 7,221 | -- | -- | -- | -- |
| SC-3 | 336 | 63222 | Kalamazoo Spring WR-6 | 08/12/2005 | 9:15 | 39.56648 | 114.59594 | 7,221 | -- | 11.30 | 7.11 | 347 |
| SC-3 | 336 | 63567 | Kalamazoo Spring WR-6 | 11/8/2005 | 7:59 | 39.56648 | 114.59594 | 7,221 | -- | 11.9 | 7.47 | 358 |
| SC-3 | 336 | 64236 | Kalamazoo Spring WR-6 | 02/25/2006 | 10:00 | 39.56648 | 114.59594 | 7,221 | -- | 11.7 | 7.6 | 354 |
| SC-5 | 340 | 62978 | Robbers Roost Spring | 07/31/2005 | 10:40 | 38.77051 | 114.78331 | 7,530 | 14 | 8.5 | 6.83 | 492 |
| SC-6 | 200 | 62981 | Sidehill Spring | 08/01/2005 | 9:40 | 38.41596 | 114.79613 | 6,400 | 10 | 12.6 | 6.76 | 396 |
| Seaman Range | | | | | | | | | | | | |
| SE-1 | 306 | -- | Seaman Spring | 06/25/2004 | 17:15 | 37.86120 | 115.19877 | 5,674 | < 0.1 | -- | -- | -- |
| SE-2 | 161 | 60842 | Oreana Spring | 06/25/2004 | 18:30 | 37.91775 | 115.15378 | 6,000 | 0.8 | 25.5 | 7.2 | 575 |
| Snake Range | | | | | | | | | | | | |
| SN-1 | 376 | 62972 | Unnamed Spring #4 | 07/28/2005 | 9:45 | 38.83510 | 114.19637 | 7,734 | 40 | 6.1 | 6.43 | 713 |
| SN-2 | 377 | 62973 | Unnamed Spring #5 | 07/28/2005 | 11:00 | 38.85148 | 114.17036 | 6,963 | 15 | 11.9 | 6.97 | 524 |
| SN-3 | 379 | 62920 | Unnamed Spring #3 | 07/13/2005 | 16:00 | 38.73321 | 114.33335 | 6,581 | 10 | 11.7 | 6.78 | 830 |
| SN-4 | 380 | 62913 | Cedar Cabin Spring | 07/13/2005 | 17:30 | 38.79689 | 114.22339 | 7,973 | 1 | 9.6 | 7.55 | 432 |
| SN-5 | 381 | 62914 | Decathon Spring | 07/14/2005 | 8:40 | 38.80738 | 114.27884 | 8,270 | 4 | 7.6 | 6.89 | 525 |
| SN-6 | 382 | 62915 | Mustang Spring | 07/14/2005 | 12:30 | 38.86257 | 114.27179 | 10,114 | 50 | 4.3 | 7.09 | 329 |
| SN-7 | 383 | 62917 | South Spring | 07/14/2005 | 18:22 | 38.80405 | 114.17588 | 7,446 | 50 | 9.7 | 6.87 | 502 |
| SN-8 | 384 | 62916 | Spring Creek Spring | 07/16/2005 | 12:20 | 38.90935 | 114.11295 | 6,130 | 2,000 | 12.9 | 7.26 | 380 |
| SN-9 | 389 | 62918 | Unnamed Spring #1 | 07/13/2005 | 9:15 | 38.78728 | 114.29724 | 7,942 | 10 | 9.5 | 6.82 | 430 |
| SN-10 | 390 | 62919 | Unnamed Spring #2 | 07/13/2005 | 13:21 | 38.79237 | 114.29201 | 7,871 | 10 | 8.3 | 7.26 | 391 |
| SN-11 | 401 | 63282 | Cain Springs | 8/26/2005 | 10:20 | 39.54258 | 114.22588 | 6,980 | 5 | 14.9 | 6.92 | 1,820 |
| SN-12 | 402 | 63283 | Unnamed Spring #11 | 8/26/2005 | 13:15 | 39.48477 | 114.31032 | 7,790 | 20 | 8.9 | 6.71 | 390 |
| SN-13 | 403 | 63284 | Eight Mile Spring | 8/26/2005 | 16:00 | 39.38830 | 114.28433 | 8,128 | 750 | 11.1 | 7.02 | 473 |
| SN-14 | 404 | 63527 | Unnamed Spring #12 | 10/25/2005 | 11:00 | 39.30747 | 114.21610 | 9,193 | 30 | 7.6 | 7.24 | 222 |
| SN-15 | 405 | 63528 | Mud Spring | 10/25/2005 | 16:00 | 39.32571 | 114.26714 | 8,883 | 35 | 6.9 | 7.13 | 441 |
| SN-16 | 406 | 63529 | Unnamed Spring | 10/26/2005 | 11:18 | 39.22993 | 114.26071 | 8,022 | 40 | 9.2 | 7.39 | 550 |
| SN-17 | 407 | 63530 | Unnamed Spring near Rock Spring | 10/26/2005 | 15:00 | 39.17779 | 114.28686 | 7,400 | 25 | 9.9 | 7.48 | 1249 |
| SN-18 | 409 | 63532 | Raised Spring | 10/27/2005 | 11:00 | 38.97259 | 114.37041 | 7,091 | 5 | 10.8 | 6.07 | 57.6 |
| Sheep Range | | | | | | | | | | | | |
| SH-1 | 307 | 58503 | Corn Creek Spring South | 01/17/2004 | 14:30 | 36.43890 | 115.35775 | 3,000 | 172.0 | 21.4 | 7.4 | 478 |
| SH-1 | 307 | 60852 | Corn Creek Spring South | 06/30/2004 | 14:30 | 36.43890 | 115.35775 | 3,000 | -- | 21.1 | 7.3 | 479 |
| SH-2 | 49 | 58487 | Wiregrass Spring | 01/17/2004 | 9:30 | 36.63310 | 115.20861 | 8,000 | 0.1 | 8.2 | 7.3 | 546 |

Table A-1. Location and field parameters for springs in recharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter) (continued).

| Recharge Area and Site | Reference Site | DRI Lab # | Site Name | Sample Date | Sample Time | Latitude dec deg | Longitude dec deg | Altitude (ft) | Flow (gpm) | Water Temp (˚C) | pH (field) | EC (field) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SH-2 | 49 | 60851 | Wiregrass Spring | 06/30/2004 | 19:30 | 36.63310 | 115.20861 | 8,000 | < 0.1 | 9.9 | 6.9 | 545 |
| SH-2 | 49 | 62400 | Wiregrass Spring | 04/29/2005 | 10:25 | 36.63310 | 115.20861 | 8,000 | 7.5 | 8.3 | 6.6 | 590 |
| SH-3 | 64 | 61095 | White Rock Spring | 07/27/2004 | 10:17 | 36.70791 | 115.23942 | 5,940 | 0.1 | 19.9 | 7.0 | 578 |
| SH-3 | 64 | 62398 | White Rock Spring | 04/28/2005 | 16:02 | 36.70791 | 115.23942 | 5,940 | 0.4 | 10.2 | 6.5 | 511 |
| SH-4 | 47 | 61105 | Cow Camp Spring | 07/27/2004 | 17:30 | 36.58361 | 115.30722 | 6,200 | 0.1 | 16.8 | 7.3 | 618 |
| SH-4 | 47 | 62399 | Cow Camp Spring | 04/28/2005 | 11:49 | 36.58361 | 115.30722 | 6,200 | 0.8 | 10.1 | 7.0 | 666 |
| SH-5 | 341 | 62397 | Rye Patch Spring | 04/28/2005 | 12:30 | 36.57967 | 115.30586 | 6,134 | 0.5 | 9.7 | 7.5 | 477 |
| White Pine Range | | | | | | | | | | | | |
| WP-1 | 320 | 57694 | Monitoring Spring WR-1 | 10/12/2003 | 14:38 | 38.94903 | 115.41008 | 8,066 | 300.0 | 5.7 | 7.5 | 351 |
| WP-1 | 320 | 59578 | Monitoring Spring WR-1 | 03/23/2004 | 14:35 | 38.94903 | 115.41008 | 8,066 | 450.0 | 6.0 | 7.5 | 383 |
| WP-1 | 320 | 60784 | Monitoring Spring WR-1 | 06/21/2004 | 16:35 | 38.94903 | 115.41008 | 8,066 | -- | 6.7 | 8 | 352 |
| WP-1 | 320 | 61478 | Monitoring Spring WR-1 | 09/22/2004 | 14:46 | 38.94903 | 115.41008 | 8,066 | -- | 7.3 | 7.4 | 347 |
| WP-1 | 320 | 61962 | Monitoring Spring WR-1 | 01/21/2005 | 16:11 | 38.94903 | 115.41008 | 8,066 | -- | 5.0 | 8.1 | 200 |
| WP-1 | 320 | 62632A | Monitoring Spring WR-1 | 05/21/2005 | 9:30 | 38.94903 | 115.41008 | 8,066 | -- | 6.4 | 6.6 | 419 |
| WP-1 | 320 | 63218 | Monitoring Spring WR-1 | 08/14/2005 | 9:00 | 38.94951 | 115.40898 | 8,066 | -- | 5.90 | 6.80 | 345 |
| WP-1 | 320 | 63561 | Monitoring Spring WR-1 | 11/5/2005 | 15:36 | 38.94951 | 115.40898 | 8,066 | -- | 5.7 | 7.2 | 328 |
| WP-1 | 320 | 64235 | Monitoring Spring WR-1 | 02/24/2006 | 12:02 | 38.94951 | 115.40898 | 8,066 | -- | 5.7 | 7.51 | -- |
| WP-2 | 225 | -- | Saddle Spring | 10/12/2003 | 10:45 | 38.97541 | 115.40023 | 7,648 | < 1 | -- | -- | -- |
| WP-2 | 357 | 62820 | Saddle Spring | 06/28/2005 | 15:30 | 38.97541 | 115.40023 | 7,648 | 1.5 | 7.6 | 6.20 | 233 |
| WP-3 | 321 | -- | Unnamed Spring in dry creek bed | 10/12/2003 | 9:01 | 38.89546 | 115.38372 | 7,722 | -- | -- | -- | -- |
| WP-4 | 322 | -- | Deer Spring | 10/12/2003 | 11:55 | 38.99493 | 115.39131 | 7,929 | 1.3 | -- | -- | -- |
| WP-4 | 322 | 62822 | Deer Spring | 06/28/2005 | 17:15 | 38.99493 | 115.39131 | 7,929 | 10.0 | 9.4 | 6.90 | 230 |
| WP-5 | 331 | 62710 | Circle Wash Spring | 06/06/2005 | 9:30 | 39.12170 | 115.36929 | 7,944 | 4.0 | 7.6 | 6.2 | 155 |
| WP-6 | 347 | 62711 | Stove Spring | 06/06/2005 | 11:09 | 39.09486 | 115.36359 | 7,852 | 5.0 | 9.1 | 6.4 | 246 |
| WP-7 | 337 | 62712 | Little Tom Plain Spring | 06/06/2005 | 11:45 | 39.08092 | 115.37152 | 7,832 | 7.0 | 8.0 | 6.7 | 423 |
| WP-8 | 326 | 62713 | Big Tom Plain Spring | 06/06/2005 | 12:30 | 39.08701 | 115.37737 | 7,932 | 25.0 | 7.4 | 6.7 | 614 |
| WP-9 | 342 | 62714 | Sage Hen Spring | 06/06/2005 | 14:02 | 39.11533 | 115.39212 | 8,182 | 10.0 | 7.7 | 6.2 | 271 |
| WP-10 | 330 | 62715 | Chicken Spring | 06/07/2005 | 9:00 | 39.23885 | 115.38886 | 7,567 | 10.0 | 8.3 | 6.6 | 342 |
| WP-11 | 349 | 62716 | Unmarked Aspen Springs (North) | 06/07/2005 | 10:45 | 39.22100 | 115.39905 | 7,900 | 11.0 | 6.9 | 6.5 | 210 |
| WP-12 | 354 | 62717 | Unnamed Stone Cabin Spring | 06/07/2005 | 12:01 | 39.15911 | 115.39892 | 8,102 | 5.0 | 8.5 | 6.8 | 441 |
| WP-13 | 350 | 62718 | Unnamed Hayden Canyon Spr. | 06/07/2005 | 12:45 | 39.15147 | 115.39264 | 7,853 | 3.0 | 6.9 | 7.0 | 438 |
| WP-14 | 344 | 62719 | Shellback Spring | 06/07/2005 | 13:45 | 39.13197 | 115.38436 | 8,089 | 3.0 | 7.7 | 6.5 | 232 |
| WP-15 | 352 | 62720 | Unnamed Shellback Ridge Spr. | 06/07/2005 | 14:40 | 39.14038 | 115.38952 | 7,989 | 0.5 | 7.0 | 4.9 | 554 |
| WP-16 | 324 | 62721 | Aspen Springs (South) | 06/07/2005 | 16:10 | 39.21629 | 115.39800 | 8,110 | 20.0 | 6.9 | 7.0 | 212 |
| WP-17 | 359 | 62818 | Unnamed Spring #1 | 06/28/2005 | 13:45 | 38.96778 | 115.39900 | 8,180 | 27.0 | 8.3 | 6.54 | 214 |
| WP-18 | 360 | 62819 | Unnamed Spring #2 | 06/28/2005 | 15:00 | 38.97696 | 115.40065 | 8,303 | 12.0 | 8.7 | 5.68 | 144 |

Table A-1. Location and field parameters for springs in recharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter) (continued).

| Recharge Area and Site | Reference Site | DRI Lab # | Site Name | Sample Date | Sample Time | Latitude dec deg | Longitude dec deg | Altitude (ft) | Flow (gpm) | Water Temp (˚C) | pH (field) | EC (field) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WP-19 | 361 | 62821 | Unnamed Spring #3 | 06/28/2005 | 16:15 | 38.98418 | 115.39037 | 7,923 | 20.0 | 9.8 | 6.10 | 258 |
| WP-20 | 362 | 62824 | Unnamed Spring #4 | 06/29/2005 | 10:43 | 39.03508 | 115.39405 | 7,662 | 1.0 | 8.1 | 6.90 | 512 |
| WP-21 | 363 | 62825 | Unnamed Spring #5 | 06/29/2005 | 11:45 | 39.00631 | 115.39043 | 7,650 | 22.0 | 9.0 | 7.00 | 377 |
| WP-22 | 364 | 62826 | Unnamed Spring #6 | 06/29/2005 | 13:23 | 38.99010 | 115.37401 | 7,670 | 12.0 | 9.1 | 6.80 | 321 |
| WP-23 | 365 | 62823 | Easter Spring | 06/29/2005 | 9:20 | 39.04120 | 115.34883 | 7,170 | -- | 11.1 | 7.30 | 363 |
| WP-24 | 366 | 62832 | Tunnel Spring | 07/01/2005 | 10:30 | 39.35142 | 115.44964 | 7,405 | 1.0 | 10.4 | 7.00 | 590 |
| WP-25 | 388 | 62827 | Halfway Spring | 06/29/2005 | 16:00 | 38.96442 | 115.31149 | 7,117 | <1 | 12.9 | 7.80 | 730 |
| White Rock Mountains | | | | | | | | | | | | |
| WM-1 | 315 | 60312 | Tobe Spring | 05/20/2004 | 13:00 | 38.00609 | 114.08980 | 7,300 | < 1 | 19.8 | 8.70 | 425 |
| WM-2 | 316 | 60313 | Tobe Spring 2 | 05/20/2004 | 14:00 | 38.00675 | 114.08969 | 7,300 | 0.2 | 13.7 | 7.20 | 277 |
| WM-3 | 173 | 60315 | Unnamed Spring nr Redd's Cabin Summit | 05/21/2004 | 14:00 | 38.12531 | 114.06878 | 7,300 | < 1 | 15.9 | 7.85 | 694 |
| WM-4 | 317 | 60316 | Barrel Spring | 05/21/2004 | 16:00 | 38.13105 | 114.05505 | 7,500 | < 1 | 9.8 | 7.72 | 380 |
| WM-5 | 318 | 60317 | Lion Spring | 05/21/2004 | 17:45 | 38.25863 | 114.13032 | 7,200 | 0.5 | 9.8 | 7.77 | 317 |
| WM-6 | 319 | 60318 | South Monument Spring | 05/21/2004 | 20:00 | 38.25480 | 114.11710 | 7,700 | < 1 | 9.1 | 7.10 | 253 |
| WM-7 | 412 | 63598 | Ripgut Sp #40 | 11/19/2005 | 15:10 | 38.24802 | 114.03920 | 6,783 | 15 | 18.6 | 6.95 | 258 |
| Wilson Creek Range | | | | | | | | | | | | |
| WC-1 | 309 | 60311 | Headwaters Spring WR-5 | 05/19/2004 | 19:30 | 38.36575 | 114.31935 | 8,000 | 56.0 | 9.6 | 7.0 | 945 |
| WC-1 | 309 | 60311B | Headwaters Spring WR-5 | 07/18/2004 | 0:00 | 38.36575 | 114.31935 | 8,000 | -- | -- | -- | -- |
| WC-1 | 309 | 60311A | Headwaters Spring WR-5 | 08/18/2004 | 12:00 | 38.36575 | 114.31935 | 8,000 | -- | -- | -- | -- |
| WC-1 | 309 | 61481 | Headwaters Spring WR-5 | 09/23/2004 | 15:37 | 38.36575 | 114.31935 | 8,000 | -- | 8.2 | 6.85 | 283 |
| WC-1 | 309 | 62970 | Headwaters Spring WR-5 | 07/27/2005 | 11:19 | 38.36575 | 114.31935 | 8,000 | -- | 10.5 | 6.31 | 95.7 |
| WC-1 | 309 | 63221 | Headwaters Spring WR-5 | 08/13/2005 | 10:30 | 38.36575 | 114.31935 | 8,000 | -- | 10.6 | 5.52 | 101 |
| WC-1 | 309 | 63565 | Headwaters Spring WR-5 | 11/07/2005 | 10:15 | 38.36575 | 114.31935 | 8,000 | -- | 9.5 | 6.36 | 114 |
| WC-2 | 310 | 60310 | Bailey Spring | 05/18/2004 | 18:40 | 38.35295 | 114.36718 | 7,000 | < 1 | 17.9 | 7.8 | 382 |
| WC-3 | 311 | -- | Blue Rock Spring | 04/28/2004 | -- | 38.15344 | 114.35401 | 7,460 | < 1 | -- | -- | -- |
| WC-4 | 312 | 60081 | Upper Tower Spring | 04/28/2004 | 16:14 | 38.12049 | 114.33344 | 6,873 | < 1 | -- | -- | -- |
| WC-5 | 313 | -- | Unnamed Spr in Miller Canyon | 05/19/2004 | 17:10 | 38.32738 | 114.24383 | 7,079 | < 1 | -- | -- | -- |
| WC-6 | 314 | 60314 | Horsethief Spring | 05/20/2004 | 18:30 | 38.02676 | 114.24503 | 6,600 | < 1 | 11.7 | 6.9 | 389 |
| WC-6 | 314 | 62406 | Horsethief Spring | 05/01/2005 | 9:30 | 38.02676 | 114.24503 | 6,600 | 3.5 | 9.7 | 6.39 | 527 |

Table A-2. Dissolved oxygen and water chemistry for springs in recharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter).

| Recharge Area and Site | Site Name | Sample Date | DO (mg/l) | Ca (mg/l) | Mg (mg/l) | Na (mg/l) | K (mg/l) | Cl (mg/l) | $SO_4$ | $HCO_3$-lab (mg/l) | $CO_3$-lab (mg/l) | $SiO_2$ (mg/l) | F (mg/l) | Br (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antelope Range | | | | | | | | | | | | | | |
| AR-1 | Tippet Spring | 08/24/2005 | 2.76 | 54.8 | 30.2 | 7.65 | 1.08 | 7.1 | 26.0 | 279 | 0.0 | 12.0 | 0.05 | 0.04 |
| AR-2 | Unnamed Spring #8 | 08/24/2005 | 2.9 | 35.9 | 6.98 | 12.8 | 1.89 | 11.1 | 22.1 | 130 | 0.0 | 44.9 | 0.13 | 0.08 |
| AR-3 | Unnamed Spring #9 | 08/25/2005 | 5.6 | 32.8 | 6.25 | 8.86 | 3.03 | 14.8 | 14.9 | 109 | 0.0 | 44.4 | 0.10 | 0.10 |
| AR-4 | Unnamed Spring #10 | 08/25/2005 | 1.29 | 92.0 | 49.2 | 34.1 | 1.19 | 35.5 | 175 | 329 | 0.0 | 19.3 | 0.16 | 0.19 |
| AR-5 | Dipping Tank Spring | 08/25/2005 | 7.77 | 47.5 | 8.37 | 16.2 | 2.01 | 18 | 14.6 | 167 | 0.0 | 30.7 | 0.10 | 0.12 |
| AR-6 | Rock Springs | 08/25/2005 | 5.1 | 50.0 | 8.01 | 12.5 | 0.91 | 5.8 | 15.7 | 188 | 0.0 | 38.2 | 0.05 | 0.06 |
| Buck Mountains | | | | | | | | | | | | | | |
| BK-1 | Mud Spring | 06/05/2005 | 9.4 | 118 | 13.2 | 41.7 | 2.6 | 31.7 | 98.5 | 310 | 0.0 | 20.3 | 0.4 | 0.20 |
| BK-2 | Woodchuck Spring | 06/05/2005 | 6.9 | 114 | 12.7 | 30.6 | 2.7 | 30.9 | 87.9 | 308 | 0.0 | 21.5 | 0.34 | 0.23 |
| BK-3 | Unnamed Near Little Willow Spring | 06/05/2005 | 8.4 | 32.7 | 3.1 | 6.3 | 3.5 | 3.1 | 5.4 | 115 | 0.0 | 42.5 | <.05 | 0.02 |
| Butte Mountains | | | | | | | | | | | | | | |
| BT-1 | Butte Spring | 05/24/2005 | 7.4 | 60.1 | 9.4 | 18.1 | 3.3 | 12.4 | 17.0 | 222 | 0.0 | 43.8 | 0.14 | 0.11 |
| BT-2 | Sammy Spring | 05/24/2005 | 6.9 | 45.6 | 6.5 | 15.0 | 5.4 | 15.2 | 17.3 | 159 | 0.0 | 59.5 | 0.13 | <.02 |
| BT-3 | White Rock Spring | 05/24/2005 | 6.0 | 48.5 | 8.1 | 16.0 | 1.2 | 7.5 | 13.9 | 187 | 0.0 | 44.5 | 0.08 | <.02 |
| BT-4 | Summit Spring | 06/04/2005 | 6.4 | 54.5 | 9.3 | 17.4 | 4.6 | 25.8 | 30.0 | 151 | 0.0 | 48.3 | 0.22 | 0.22 |
| BT-5 | Robbers Roost No. 2 Spring | 06/04/2005 | 1.3 | 24.7 | 5.8 | 10.4 | 1.8 | 2.9 | 3.0 | 116 | 0.0 | 44.8 | 0.10 | 0.05 |
| BT-6 | Deer Spring | 06/04/2005 | 6.4 | 53.7 | 10.8 | 15.7 | 1.3 | 10.8 | 23.9 | 194 | 0.0 | 39.7 | 0.09 | 0.10 |
| BT-7 | Cabin Spring | 06/05/2005 | 8.7 | 71.9 | 13.6 | 27.4 | 4.1 | 20.3 | 31.6 | 271 | 0.0 | 42.7 | 0.18 | 0.14 |
| BT-8 | Indian Spring | 06/05/2005 | 7.9 | 42.2 | 6.3 | 15.1 | 5.2 | 12.4 | 15.7 | 153 | 0.0 | 54.6 | 0.12 | 0.10 |
| Cherry Creek Range | | | | | | | | | | | | | | |
| CC-1 | Johnson Spring | 05/24/2005 | 9.0 | 69.3 | 22.5 | 41.2 | 3.8 | 30.5 | 61.1 | 295 | 0.0 | 22.4 | 0.56 | 0.26 |
| CC-2 | Snow Creek Spring | 05/24/2005 | 9.3 | 48.5 | 8.1 | 3.1 | 0.5 | 2.2 | 5.4 | 179 | 0.0 | 8.5 | 0.09 | <.02 |
| CC-3 | Lower Snow Creek Spring | 05/24/2005 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Clover Mountains | | | | | | | | | | | | | | |
| CR-1 | Garden Spring | 01/15/2004 | 6.5 | 177 | 41.4 | 46.1 | 1.0 | 21.0 | 327 | 657 | 0.0 | 39.8 | -- | -- |
| CR-2 | Unnamed Spring (Clover) | 01/15/2004 | 4.9 | 126 | 22.6 | 56.6 | 1.5 | 14.8 | 157.0 | 401 | 0.0 | 35.4 | -- | -- |
| CR-3 | Kershaw-Ryan Spring #1 | 03/27/2004 | 6.5 | 24.2 | 2.7 | 26.5 | 4.4 | 6.3 | 4.4 | 140 | 0.0 | 46.1 | -- | -- |
| CR-4 | Ella Spring | 03/27/2004 | 3.6 | 44.2 | 8.6 | 11.1 | 1.8 | 7.0 | 8.8 | 170 | 0.0 | 27.1 | -- | -- |
| CR-5 | Unnamed Spring nr Clover Creek | 07/31/2004 | 0.9 | 67.4 | 9.05 | 29.9 | 6.83 | 20.3 | 11.1 | 299 | 0.0 | 55.6 | 1.10 | 0.11 |
| CR-6 | Big Spring | 07/31/2004 | 7.4 | 27.3 | 4.26 | 9.5 | 2.58 | 7.3 | 3.9 | 111 | 0.0 | 48.2 | 2.14 | 0.04 |
| CR-6 | Big Spring | 04/30/2005 | 7.1 | 30.2 | 4.46 | 11.1 | 2.55 | 9.0 | 4.8 | 114 | 0.0 | 45.8 | 1.90 | <.02 |
| CR-7 | Little Springs | 07/31/2004 | 5.3 | 30.2 | 5.11 | 11.2 | 2.77 | 9.7 | 4.8 | 137 | 0.0 | 56.5 | 2.55 | 0.04 |
| CR-7 | Little Springs | 04/30/2005 | 6.7 | 29.6 | 4.73 | 10.8 | 2.45 | 8.6 | 5.0 | 112 | 0.0 | 46.6 | 2.20 | <.02 |
| CR-8 | Quaking Aspen Spring | 07/31/2004 | 3.2 | 13.8 | 3.68 | 11.4 | 1.48 | 4.1 | 2.1 | 83.3 | 0.0 | 49.6 | 1.05 | <.02 |

Table A-2. Dissolved oxygen and water chemistry for springs in recharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter) (continued).

| Recharge Area and Site | Site Name | Sample Date | DO (mg/l) | Ca (mg/l) | Mg (mg/l) | Na (mg/l) | K (mg/l) | Cl (mg/l) | $SO_4$ | $HCO_3$-lab (mg/l) | $CO_3$-lab (mg/l) | $SiO_2$ (mg/l) | F (mg/l) | Br (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CR-9 | Sheep Spring | 07/31/2004 | 1.1 | 32.7 | 6.46 | 11.8 | 2.01 | 9.8 | 5.1 | 143 | 0.0 | 45.5 | 1.08 | 0.04 |
| CR-10 | Cave Spring | 07/31/2004 | 4.7 | 47.8 | 9.12 | 26.4 | 8.41 | 20.0 | 10.8 | 219 | 0.0 | 57.4 | 0.33 | 0.10 |
| CR-11 | East Settling Spring | 07/31/2004 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Delamar Mountains | | | | | | | | | | | | | | |
| DR-1 | Red Rock Spring | 01/10/2004 | -- | 85.4 | 13.3 | 28.4 | 2.4 | 15.7 | 16.3 | 332 | 0.0 | 41.1 | -- | -- |
| DR-2 | Willow Spring (KSV-1) | 01/12/2004 | 8.3 | 18.2 | 3.2 | 55.9 | 2.2 | 21.3 | 33.5 | 131 | 0.0 | 67.3 | -- | -- |
| DR-2 | Willow Spring (KSV-1) | 04/27/2005 | 1.6 | 19.9 | 4.3 | 9.9 | 1.7 | 6.5 | 6.3 | 84.9 | 0.0 | 65.3 | 0.94 | 0.03 |
| DR-3 | Boulder Spring (KSV-4) | 01/13/2004 | 8.8 | 19.4 | 4.5 | 11.4 | 0.3 | 6.6 | 5.7 | 88.9 | 0.0 | 42.8 | -- | -- |
| DR-3 | Boulder Spring (KSV-4) | 04/27/2005 | 7.7 | 21.2 | 3.8 | 55.2 | 4.1 | 25.0 | 34.8 | 138 | 0.0 | 37.2 | 1.55 | <.02 |
| DR-4 | Kane Springs (KSV-3) | 01/13/2004 | 5.2 | 49.0 | 13.6 | 20.3 | 1.4 | 17.6 | 15.1 | 214 | 0.0 | 64.5 | -- | -- |
| DR-5 | Upper Riggs Spring WR-4 | 01/13/2004 | 4.4 | 64.7 | 15.9 | 19.4 | 0.0 | 17.5 | 12.0 | 274 | 0.0 | 57.8 | -- | -- |
| DR-5 | Upper Riggs Spring WR-4 | 04/29/2004 | 10.9 | 57.6 | 15.9 | 17.6 | 3.4 | 16.5 | 12.7 | 256 | 0.0 | 48.8 | -- | -- |
| DR-5 | Upper Riggs Spring WR-4 | 10/19/2004 | 0.7 | 63.4 | 16.6 | 18.8 | 4.16 | 16.4 | 9 | 277 | 0.0 | 57.2 | 0.33 | 0.14 |
| DR-5 | Upper Riggs Spring WR-4 | 02/10/2005 | 6.8 | 35.5 | 8.79 | 11.6 | 2.04 | 7.2 | 8.1 | 153 | 0.0 | 42.0 | 0.40 | 0.07 |
| DR-5 | Upper Riggs Spring WR-4 | 05/19/2005 | 3.6 | 48.4 | 11.7 | 14.2 | 2.7 | 12.0 | 10.2 | 204 | 0.0 | 49.8 | 0.49 | <.02 |
| DR-6 | Bishop Spring | 01/14/2004 | 6.3 | 68.0 | 24.1 | 17.1 | 0.9 | 13.4 | 14.5 | 332 | 0.0 | 54.8 | -- | -- |
| DR-6 | Bishop Spring | 05/20/2005 | 4.6 | 74.6 | 19.3 | 19.6 | 2.7 | 15.5 | 21.5 | 307 | 0.0 | 58.7 | 0.13 | 0.16 |
| DR-7 | Lower Indian Spring | 01/14/2004 | 3.6 | 1.9 | 0.2 | 95.1 | 0.8 | 12.1 | 10.4 | 221 | 0.0 | 56.2 | -- | -- |
| DR-8 | Upper Indian Spring | 01/14/2004 | 3.6 | 68.0 | 19.3 | 23.9 | 0.3 | 9.1 | 13.0 | 319 | 0.0 | 53.4 | -- | -- |
| DR-9 | Oak Spring | 01/16/2004 | 7.1 | 84.9 | 16.5 | 64.1 | 2.0 | 41.1 | 34.2 | 355 | 0.0 | 56.5 | -- | -- |
| DR-10 | Narrow Spring | 03/22/2004 | 5.8 | 61.9 | 12.7 | 17.7 | 1.9 | 17.9 | 20.8 | 228 | 0.0 | 47.2 | -- | -- |
| DR-11 | Sawmill Spring West | 03/22/2004 | 6.6 | 33.9 | 4.6 | 12.1 | 2.0 | 7.4 | 7.0 | 146 | 0.0 | 36.8 | -- | -- |
| DR-12 | Sawmill Spring | 03/22/2004 | 10.3 | 56.2 | 10.4 | 18.9 | 2.2 | 16.6 | 19.0 | 220 | 0.0 | 41.7 | -- | -- |
| DR-13 | Willow Spring 2 (So. of Oak Spring summit) | 03/25/2004 | 2.5 | 59.4 | 14.7 | 25.5 | 1.8 | 13.6 | 15.2 | 274 | 0.0 | 55.7 | -- | -- |
| DR-14 | Lower Chokecherry Spring | 03/25/2004 | 7.3 | 73.2 | 15.2 | 26.7 | 1.6 | 19.4 | 25.0 | 296 | 0.0 | 53.4 | -- | -- |
| DR-15 | Upper Chokecherry Spring | 03/25/2004 | 7.3 | 53.0 | 10.6 | 23.2 | 1.2 | 13.6 | 16.7 | 219 | 0.0 | 50.0 | -- | -- |
| DR-16 | Unnamed Chokecherry Spring | 03/25/2004 | 6.2 | 23.9 | 5.9 | 9.3 | 1.4 | 3.5 | 7.9 | 109 | 0.0 | 48.6 | -- | -- |
| DR-17 | Buckboard Spring | 03/26/2004 | 7.1 | 45.1 | 8.3 | 17.3 | 2.1 | 13.9 | 10.6 | 182 | 0.0 | 45.5 | -- | -- |
| DR-18 | Cottonwood Spring | 03/26/2004 | 2.3 | 80.0 | 9.3 | 29.5 | 0.7 | 17.3 | 18.7 | 311 | 0.0 | 48.7 | -- | -- |
| DR-19 | Abandoned Spring | 03/26/2004 | 7.7 | 81.0 | 20.0 | 50.0 | 2.3 | 35.2 | 41.8 | 357 | 0.0 | 27.8 | -- | -- |
| DR-20 | Grassy Spring | 03/26/2004 | 5.3 | 111 | 19.2 | 51.0 | 0.6 | 57.0 | 54.0 | 339 | 0.0 | 36.4 | -- | -- |
| DR-20 | Grassy Spring | 04/27/2005 | 5.7 | 116 | 20.7 | 39.9 | 0.93 | 70.7 | 69.0 | 330 | 0.0 | 36.8 | 0.23 | 0.07 |
| Egan Range | | | | | | | | | | | | | | |
| ER-1 | Upper Terrace Spring WR-2 | 10/13/2003 | -- | 39.7 | 10.9 | 4.1 | 0.7 | 2.1 | 7.3 | 173 | 0.0 | 11.9 | -- | -- |
| ER-1 | Upper Terrace Spring WR-2 | 10/15/2003 | 5.1 | 39.8 | 11.0 | 4.1 | 0.7 | 2.1 | 7.3 | 172 | 0.0 | 12.1 | -- | -- |
| ER-1 | Upper Terrace Spring WR-2 | 04/26/2004 | -- | 40.5 | 10.8 | 4.25 | 0.80 | 2.1 | 7.1 | 172 | 0.0 | 9.2 | -- | -- |
| ER-1 | Upper Terrace Spring WR-2 | 06/23/2004 | 8.0 | 40.4 | 10.7 | 3.60 | 0.71 | 2.4 | 7.4 | 169 | 0.0 | 11.8 | 0.09 | 0.02 |

Table A-2. Dissolved oxygen and water chemistry for springs in recharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter) (continued).

| Recharge Area and Site | Site Name | Sample Date | DO (mg/l) | Ca (mg/l) | Mg (mg/l) | Na (mg/l) | K (mg/l) | Cl (mg/l) | $SO_4$ | $HCO_3$-lab (mg/l) | $CO_3$-lab (mg/l) | $SiO_2$ (mg/l) | F (mg/l) | Br (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ER-1 | Upper Terrace Spring WR-2 | 09/22/2004 | 7.1 | 41.6 | 11.3 | 4.29 | 0.75 | 2.4 | 7.3 | 177 | 0.0 | 11.8 | 0.09 | <.02 |
| ER-1 | Upper Terrace Spring WR-2 | 02/09/2005 | 8.3 | 40.3 | 10.7 | 4.24 | 0.81 | 2.3 | 7.7 | 168 | 0.0 | 11.1 | 0.09 | 0.02 |
| ER-1 | Upper Terrace Spring WR-2 | 05/21/2005 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 12.3 | 0.12 | <.02 |
| ER-1 | Upper Terrace Spring WR-2 | 08/11/2005 | 8.30 | 41.8 | 10.5 | 4.1 | 0.8 | 2.3 | 7.9 | 173 | 0.0 | 11.2 | 0.09 | <.02 |
| ER-1 | Upper Terrace Spring WR-2 | 11/06/2005 | 8.05 | 41.3 | 10.8 | 4.06 | 0.74 | 2.2 | 7.5 | 167 | 0.0 | 11.3 | 0.1 | 0.02 |
| ER-2 | Water Canyon Spring | 10/14/2003 | 7.9 | 40.1 | 11.0 | 4.0 | 0.7 | 7.3 | 1.6 | 180 | 0.0 | 12.0 | -- | -- |
| ER-3 | Lone Pine Spring | 10/13/2003 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| ER-4 | Big Spring | 10/14/2003 | 5.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| ER-4 | Big Spring | 07/31/2005 | 5.24 | 34.7 | 5.8 | 12.4 | 2.4 | 3.8 | 7.1 | 152 | 0.0 | 51.7 | 0.12 | 0.06 |
| ER-5 | Water Canyon at USGS gage | 10/24/2003 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| ER-5 | Water Canyon at USGS gage (duplicate sample) | 10/24/2003 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| ER-6 | Unnamed Spring 1 | 05/24/2005 | 3.99 | 43.8 | 20.6 | 11.3 | 1.4 | 9.3 | 21.8 | 212 | 0.0 | 14.2 | 0.10 | <.02 |
| ER-7 | Silver Spring | 07/29/2005 | 7.84 | 80.6 | 5.4 | 5.4 | 0.7 | 3.5 | 10.3 | 261 | 0.0 | 12.5 | 0.09 | 0.03 |
| ER-8 | Hole in the Bank Spring | 07/31/2005 | 7.93 | 43.7 | 11.0 | 12.4 | 3.0 | 5.1 | 10.5 | 195 | 0.0 | 50.6 | 0.13 | 0.06 |
| ER-9 | Haggerty Spring | 07/31/2005 | 5.98 | 69.7 | 13.0 | 3.9 | 0.8 | 2.8 | 7.0 | 259 | 0.0 | 10.6 | 0.09 | 0.03 |
| ER-10 | Perry Spring | 10/28/2005 | 4.81 | 78.9 | 20.9 | 24.1 | 2.64 | 19.1 | 25.1 | 333 | 0.0 | 27.9 | 0.22 | 0.25 |
| Fairview Range | | | | | | | | | | | | | | |
| FR-1 | Scotty Spring | 06/26/2004 | 1.9 | 67.3 | 12.6 | 23.0 | 1.36 | 30.7 | 21.1 | 254 | 0.0 | 44.6 | -- | -- |
| FR-2 | Littlefield Spring | 06/26/2004 | 5.0 | 67.1 | 13.3 | 16.3 | 2.75 | 22.5 | 20.9 | 254 | 0.0 | 47.5 | -- | -- |
| FR-3 | Meloy Spring | 06/26/2004 | 6.9 | 68.1 | 12.2 | 16.4 | 4.40 | 24.9 | 18.1 | 248 | 0.0 | 54.2 | -- | -- |
| FR-4 | McDermitt Spring | 06/26/2004 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| FR-5 | Bailey Spring | 06/29/2004 | 7.0 | 86.4 | 21.4 | 29.8 | 2.10 | 48.3 | 26.6 | 331 | 0.0 | 32.4 | -- | -- |
| FR-5 | Bailey Spring | 05/01/2005 | 6.0 | 96.2 | 25.8 | 42.4 | 1.66 | 70.3 | 49.7 | 327 | 0.0 | 33.1 | 0.34 | 0.07 |
| FR-6 | Fence Spring | 06/29/2004 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| FR-7 | Robinson Spring | 06/29/2004 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| FR-8 | Upper Fairview | 06/29/2004 | 1.8 | 60.2 | 10.6 | 28.1 | 2.64 | 23.6 | 14.5 | 259 | 0.0 | 48.4 | -- | -- |
| FR-9 | Lower Fairview | 06/29/2004 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| FR-10 | Fox Cabin | 06/29/2004 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| FR-11 | Cottonwood Spring | 06/29/2004 | 4.6 | 33.8 | 4.87 | 17.8 | 0.80 | 6.1 | 4.7 | 161 | 0.0 | 38.0 | -- | -- |
| Fortification Range | | | | | | | | | | | | | | |
| FO-1 | Indian Springs | 07/29/2005 | 5.05 | 26.3 | 4.1 | 12.7 | 4.6 | 9.4 | 6.7 | 114 | 0.0 | 72.8 | 0.10 | 0.06 |
| Grant Range | | | | | | | | | | | | | | |
| GR-1 | Brady Spring | 10/28/2003 | -- | 82.8 | 8.5 | 2.9 | 1.0 | 0.8 | 2.9 | 292 | 0.0 | 13.8 | -- | -- |
| GR-1 | Brady Spring (duplicate sample) | 10/28/2003 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| GR-2 | Little Spring | 06/30/2005 | 1.70 | 59.4 | 12.5 | 30.5 | 5.3 | 17.1 | 26.8 | 250 | 0.0 | 69.7 | 0.26 | 0.24 |
| GR-3 | Horse Spring | 06/30/2005 | 7.20 | 51.6 | 11.8 | 24.2 | 5.4 | 14.4 | 25.7 | 213 | 0.0 | 61.5 | 0.23 | 0.19 |

Table A-2. Dissolved oxygen and water chemistry for springs in recharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter) (continued).

| Recharge Area and Site | Site Name | Sample Date | DO (mg/l) | Ca (mg/l) | Mg (mg/l) | Na (mg/l) | K (mg/l) | Cl (mg/l) | $SO_4$ | $HCO_3$-lab (mg/l) | $CO_3$-lab (mg/l) | $SiO_2$ (mg/l) | F (mg/l) | Br (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GR-4 | Teaspoon Spring | 06/30/2005 | 4.80 | 61.4 | 52.6 | 8.2 | 2.3 | 3.9 | 12.2 | 435 | 0.0 | 30.0 | 0.17 | 0.03 |
| GR-5 | Wiregrass Spring | 06/30/2005 | 4.32 | 55.0 | 68.5 | 27.4 | 2.3 | 14.6 | 94.9 | 427 | 0.0 | 29.0 | 0.16 | 0.11 |
| GR-6 | Murphy Spring | 07/02/2005 | 8.70 | 61.9 | 8.0 | 7.5 | 1.0 | 3.3 | 4.9 | 227 | 0.0 | 13.6 | 0.04 | 0.03 |
| Highland Range | | | | | | | | | | | | | | |
| HR-1 | Highland Spring | 06/24/2004 | 5.8 | 77.1 | 35.9 | 3.71 | 0.71 | 3.7 | 6.2 | 413 | 0.0 | 15.3 | -- | -- |
| HR-1 | Highland Spring | 05/01/2005 | 7.32 | 82.9 | 35.1 | 4.3 | 0.64 | 3.4 | 5.9 | 403 | 0.0 | 16.1 | 0.09 | <.02 |
| HR-2 | Deadman Spring | 06/24/2004 | 4.9 | 12.2 | 40.1 | 4.11 | 0.43 | 2.5 | 5.4 | 143 | 42.6 | 2.1 | -- | -- |
| HR-3 | Lime Spring | 06/24/2004 | 0.4 | 76.1 | 40.6 | 3.27 | 1.09 | 3.6 | 6.4 | 433 | 0.0 | 14.1 | -- | -- |
| HR-4 | Pine Spring | 06/24/2004 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| HR-5 | Connor Spring | 06/24/2004 | 7.7 | 72.3 | 25.8 | 1.48 | 0.59 | 2.0 | 3.8 | 348 | 0.0 | 8.7 | -- | -- |
| HR-6 | Big Trees Spring | 06/24/2004 | 8.1 | 76.9 | 27.6 | 1.58 | 0.59 | 1.9 | 3.6 | 368 | 0.0 | 8.5 | -- | -- |
| Indian Peak Range | | | | | | | | | | | | | | |
| IP-1 | Ryans Spring D 38 | 11/19/2005 | 2.2 | 80.8 | 8.31 | 24.9 | 0.91 | 41.5 | 22.8 | 264 | 0.0 | 33.3 | 0.09 | 0.22 |
| IP-2 | Merril's Camp D 39 | 11/19/2005 | 6.27 | 41.8 | 5.69 | 8.36 | 0.38 | 6.5 | 5.4 | 156 | 0.0 | 15.5 | 0.09 | 0.04 |
| Kern Mountains | | | | | | | | | | | | | | |
| KM-1 | Mike's Spring | 08/23/2005 | 6.4 | 61.9 | 18.9 | 31.8 | 1.81 | 29.2 | 34.8 | 246 | 0.0 | 27.5 | 0.35 | 0.18 |
| KM-2 | Unnamed Spring #7 | 08/23/2005 | 0.06 | 51.5 | 11.0 | 25.7 | 0.82 | 14.9 | 14.1 | 232 | 0.0 | 36.0 | 0.40 | 0.12 |
| KM-3 | Grass Valley Springs | 08/23/2005 | 6 | 18.0 | 3.26 | 12.3 | 0.94 | 5.9 | 5.1 | 81 | 0.0 | 26.6 | 0.09 | 0.03 |
| KM-4 | Cedar Spring | 08/23/2005 | 2.83 | 104 | 50.6 | 16.5 | 1.60 | 42.9 | 262 | 208 | 0.0 | 14.6 | 0.49 | 0.17 |
| Meadow Valley Mountains | | | | | | | | | | | | | | |
| MM-1 | Grapevine Spring | 04/27/2005 | 2.4 | 77.2 | 17.3 | 20.2 | 2.90 | 31.4 | 44.5 | 236 | 0.0 | 28.3 | 0.61 | 0.04 |
| MM-1 | Grapevine Spring WR-7 | 08/16/2005 | 0.94 | 77.5 | 17.9 | 18.7 | 2.4 | 32.7 | 46.7 | 245 | 0.0 | 27.3 | 0.69 | 0.31 |
| MM-1 | Grapevine Spring WR-7 | 110/9/2005 | 5.7 | 79.2 | 17.6 | 18.1 | 2.62 | 30.1 | 42.8 | 244 | 0.0 | 26.8 | 0.68 | 0.28 |
| MM-1 | Grapevine Spring WR-7 | 02/16/2006 | 4.86 | 76.3 | 18.0 | 18.0 | 1.95 | 32.1 | 44.8 | 228 | 0.0 | 24.2 | 0.66 | 0.30 |
| Mountain Home Range | | | | | | | | | | | | | | |
| MH-1 | Cobb Spring | 07/28/2005 | 3.80 | 72.6 | 53.2 | 21.1 | 6.6 | 14.8 | 24.7 | 502 | 0.0 | 16.0 | 0.12 | 0.07 |
| Mount Irish Range | | | | | | | | | | | | | | |
| MI-1 | Littlecut Spring | 06/25/2004 | -- | 68.8 | 19.7 | 21.1 | 2.57 | 22.2 | 30.6 | 295 | 0.0 | 55.9 | -- | -- |
| MI-1 | Littlecut Spring | 05/02/2005 | 4.8 | 75.0 | 21.0 | 22.8 | 2.3 | 21.1 | 33.1 | 302 | 0.0 | 52.2 | 0.16 | 0.03 |
| MI-2 | Henry Spring | 06/25/2004 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MI-3 | Cold Spring | 06/25/2004 | -- | 49.7 | 12.1 | 22.8 | 1.50 | 19.4 | 22.6 | 208 | 0.0 | 50.7 | -- | -- |
| MI-4 | Reed Spring | 06/25/2004 | -- | 49.6 | 14.2 | 13.7 | 2.78 | 17.3 | 18.9 | 199 | 0.0 | 43.9 | -- | -- |
| Pahroc Ranges | | | | | | | | | | | | | | |
| PR-1 | Pahroc Spring | 01/16/2004 | 5.7 | 25.6 | 6.7 | 40.1 | 5.7 | 13.1 | 12.9 | 169 | 0.0 | 66.8 | -- | -- |
| PR-1 | Pahroc Spring | 04/30/2005 | 7.32 | 31.3 | 8.33 | 12.7 | 5.16 | 12.6 | 12.8 | 134 | 0.0 | 62.1 | 0.19 | 0.02 |
| PR-2 | Hamilton Spring | 03/23/2004 | 6.8 | 66.9 | 10.8 | 29.4 | 7.2 | 22.9 | 25.5 | 260 | 0.0 | 69.4 | -- | -- |

Table A-2. Dissolved oxygen and water chemistry for springs in recharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter) (continued).

| Recharge Area and Site | Site Name | Sample Date | DO (mg/l) | Ca (mg/l) | Mg (mg/l) | Na (mg/l) | K (mg/l) | Cl (mg/l) | $SO_4$ | $HCO_3$-lab (mg/l) | $CO_3$-lab (mg/l) | $SiO_2$ (mg/l) | F (mg/l) | Br (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PR-3 | Blackrock Spring | 03/23/2004 | 8.3 | 36.7 | 8.0 | 16.1 | 4.6 | 13.9 | 15.9 | 146 | 0.0 | 63.6 | -- | -- |
| PR-4 | Unnamed Spring nr Blackrock | 03/23/2004 | 7.1 | 45.9 | 9.3 | 25.8 | 6.1 | 23.7 | 23.1 | 184 | 0.0 | 69.2 | -- | -- |
| PR-5 | Deadman Spring | 03/23/2004 | 3.0 | 42.6 | 7.1 | 20.4 | 6.8 | 20.4 | 20.2 | 151 | 0.0 | 61.7 | -- | -- |
| PR-5 | Deadman Spring (duplicate sample) | 03/23/2004 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| PR-6 | Little Boulder Spring | 03/24/2004 | 6.4 | 21.8 | 5.9 | 8.0 | 2.9 | 4.9 | 7.8 | 101 | 0.0 | 44.8 | -- | -- |
| PR-7 | Mustang Spring | 03/24/2004 | 6.2 | 105 | 7.8 | 18.4 | 6.8 | 9.9 | 61.6 | 319 | 0.0 | 62.1 | -- | -- |
| PR-8 | Rattlesnake Spring | 03/24/2004 | 7.4 | 47.6 | 7.5 | 27.6 | 5.2 | 16.5 | 19.3 | 199 | 0.0 | 52.5 | -- | -- |
| PR-9 | Unnamed Spring in Road | 07/30/2004 | 4.5 | 42.6 | 10.0 | 16.1 | 1.53 | 8.8 | 8.7 | 193 | 0.0 | 49.7 | 0.10 | 0.11 |
| PR-10 | Twin Spring | 07/30/2004 | 7.0 | 40.9 | 9.48 | 17.2 | 2.15 | 10.4 | 8.8 | 190 | 0.0 | 48.6 | 0.10 | 0.12 |
| PR-11 | Eightmile Spring | 07/30/2004 | 6.7 | 45.0 | 9.15 | 13.2 | 1.49 | 10.6 | 8.9 | 189 | 0.0 | 43.2 | 0.09 | 0.11 |
| PR-11 | Eightmile Spring | 04/30/2005 | 6.7 | 52.2 | 9.9 | 17.8 | 1.07 | 16.2 | 14.8 | 195 | 0.0 | 37.6 | 0.09 | 0.03 |
| PR-12 | Unnamed Spring nr Sixmile seep | 07/30/2004 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| PR-13 | Water Tank 0.4mi west of Sixmile | 07/30/2004 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Schell Creek Range | | | | | | | | | | | | | | |
| SC-1 | Spring Schell Creek 1 | 10/29/2003 | -- | 17.6 | 3.8 | 1.9 | 1.2 | 0.9 | 9.5 | 67.9 | 0.0 | 10.8 | -- | -- |
| SC-1 | Spring Schell Creek 1 (duplicate sample) | 10/29/2003 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SC-1 | Spring Schell Creek 1 (Unnamed Spring #3) | 07/30/2005 | 6.47 | 56.0 | 8.7 | 23.2 | 0.3 | 11.8 | 26.2 | 210 | 0.0 | 16.2 | 0.15 | 0.11 |
| SC-2 | Patterson Pass Spring WR-3 | 10/30/2003 | 6.0 | 58.4 | 9.0 | 22.4 | 0.3 | 10.6 | 23.2 | 230 | 0.0 | 17.5 | -- | -- |
| SC-2 | Patterson Pass Spring WR-3 (duplicate sample) | 10/30/2003 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SC-2 | Patterson Pass Spring WR-3 | 03/24/2004 | 3.6 | 19.5 | 3.8 | 2.0 | 1.4 | 0.9 | 9.6 | 68.6 | 0.0 | 10.8 | -- | -- |
| SC-2 | Patterson Pass Spring WR-3 | 06/23/2004 | 6.2 | 19.8 | 4.62 | 3.00 | 1.46 | 1.2 | 9.8 | 67.0 | 0.0 | 11.1 | 0.47 | <.02 |
| SC-2 | Patterson Pass Spring WR-3 | 09/23/2004 | 5.9 | 18.5 | 3.86 | 1.94 | 1.39 | 0.9 | 9.4 | 66.5 | 0.0 | 10.2 | 0.47 | 0.02 |
| SC-2 | Patterson Pass Spring WR-3 | 01/23/2005 | 5.47 | 20.5 | 4.14 | 2.20 | 1.46 | 1.2 | 9.8 | 71.6 | 0.0 | 10.5 | 0.45 | <.02 |
| SC-2 | Patterson Pass Spring WR-3 | 05/20/2005 | 6.0 | | | | | | | | | | | |
| SC-2 | Patterson Pass Spring WR-3 | 08/15/2005 | 5.98 | 18.8 | 3.7 | 1.9 | 1.4 | 1.0 | 8.7 | 66 | 0.0 | 10.1 | 0.45 | <.02 |
| SC-2 | Patterson Pass Spring WR-3 | 11/07/2005 | 6.08 | 19.3 | 3.74 | 1.90 | 1.35 | 1.1 | 8.7 | 63.8 | 0.0 | 10.0 | 0.44 | <.02 |
| SC-2 | Patterson Pass Spring WR-3 | 02/26/2006 | 6.38 | 19.4 | 3.68 | 1.86 | 1.42 | 1.2 | 8.8 | 65.0 | -- | 10.1 | 0.46 | <.02 |
| SC-3 | Kalamazoo Spring WR-6 | 07/20/2004 | 6.8 | 47.2 | 15.5 | 2.46 | 0.71 | 2.1 | 10.6 | 208 | 0.0 | 10.5 | 0.47 | <.02 |
| SC-3 | Kalamazoo Spring WR-6 | 09/21/2004 | 6.7 | 46.8 | 16.0 | 3.20 | 0.87 | 1.9 | 11.0 | 196 | 0.0 | 11.7 | 0.45 | <.02 |
| SC-3 | Kalamazoo Spring WR-6 | 01/23/2005 | 6.86 | 48.6 | 16.5 | 3.49 | 0.79 | 1.8 | 12.1 | 209 | 0.0 | 11.4 | 0.44 | <.02 |
| SC-3 | Kalamazoo Spring WR-6 | 05/23/2005 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 10.1 | 0.46 | <.02 |

Table A-2. Dissolved oxygen and water chemistry for springs in recharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter) (continued).

| Recharge Area and Site | Site Name | Sample Date | DO (mg/l) | Ca (mg/l) | Mg (mg/l) | Na (mg/l) | K (mg/l) | Cl (mg/l) | $SO_4$ | $HCO_3$-lab (mg/l) | $CO_3$-lab (mg/l) | $SiO_2$ (mg/l) | F (mg/l) | Br (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SC-3 | Kalamazoo Spring WR-6 | 08/12/2005 | 7.67 | 49.6 | 15.2 | 3.0 | 0.7 | 1.8 | 11.4 | 214 | 0.0 | 11.5 | 0.03 | <.02 |
| SC-3 | Kalamazoo Spring WR-6 | 11/08/2005 | 7.33 | 49.1 | 17.5 | 3.46 | 0.74 | 1.9 | 12.8 | 219 | 0.0 | 12.4 | <.05 | <.02 |
| SC-3 | WR6 | 02/25/2006 | 7.14 | 49.3 | 16.6 | 3.42 | 0.79 | 2.0 | 12.8 | 213 | -- | 12.1 | <.1 | <.02 |
| SC-5 | Robbers Roost Spring | 07/31/2005 | 4.15 | 58.8 | 27.9 | 11.2 | 0.6 | 7.2 | 21.7 | 304 | 0.0 | 14.3 | 0.10 | 0.06 |
| SC-6 | Sidehill Spring | 08/01/2005 | 6.33 | 50.9 | 16.6 | 12.5 | 1.1 | 6.9 | 11.9 | 242 | 0.0 | 51.4 | 0.08 | 0.09 |
| Seaman Range | | | | | | | | | | | | | | |
| SE-1 | Seaman Spring | 06/25/2004 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SE-2 | Oreana Spring | 06/25/2004 | 3.3 | 87.0 | 9.30 | 21.9 | 2.33 | 14.5 | 24.8 | 308 | 0.0 | 58.8 | -- | -- |
| Snake Range | | | | | | | | | | | | | | |
| SN-1 | Unnamed Spring #4 | 07/28/2005 | 4.98 | 131 | 22.3 | 6.1 | 1.0 | 6.6 | 17.9 | 474 | 0.0 | 11.0 | 0.05 | 0.03 |
| SN-2 | Unnamed Spring #5 | 07/28/2005 | 5.84 | 58.4 | 30.8 | 9.3 | 1.2 | 9.2 | 9.2 | 322 | 0.0 | 10.9 | 0.08 | 0.05 |
| SN-3 | Unnamed Spring #3 | 07/13/2005 | 6.50 | 104 | 21.4 | 44.7 | 1.7 | 90.1 | 70.0 | 283 | 0.0 | 114 | 0.27 | 0.62 |
| SN-4 | Cedar Cabin Spring | 07/13/2005 | 9.01 | 62.3 | 20.2 | 5.5 | 1.0 | 5.0 | 5.7 | 272 | 0.0 | 12.0 | 0.05 | 0.02 |
| SN-5 | Decathon Spring | 07/14/2005 | 7.13 | 111 | 7.6 | 2.9 | 0.5 | 3.4 | 11.4 | 325 | 0.0 | 11.3 | 0.05 | <.02 |
| SN-6 | Mustang Spring | 07/14/2005 | 8.38 | 68.0 | 4.6 | 1.3 | 0.4 | 0.8 | 5.5 | 218 | 0.0 | 5.7 | 0.04 | <.02 |
| SN-7 | South Spring | 07/14/2005 | 5.70 | 66.3 | 28.8 | 2.2 | 0.5 | 2.6 | 3.4 | 343 | 0.0 | 7.6 | <.04 | <.02 |
| SN-8 | Spring Creek Spring | 07/16/2005 | 8.07 | 64.2 | 7.9 | 6.9 | 1.2 | 6.7 | 12.5 | 227 | 0.0 | 11.5 | 0.11 | 0.03 |
| SN-9 | Unnamed Spring #1 | 07/13/2005 | 6.13 | 83.7 | 6.73 | 9.24 | 0.3 | 7.8 | 17.6 | 261 | 0.0 | 12 | 0.2 | 0.05 |
| SN-10 | Unnamed Spring #2 | 07/13/2005 | 6.37 | 83.1 | 3.37 | 3.72 | 0.24 | 2.8 | 5.8 | 254 | 0.0 | 10.2 | 0.13 | <.02 |
| SN-11 | Cain Springs | 08/26/2005 | 4.5 | 191 | 53.6 | 117 | 0.85 | 352 | 162 | 322 | 0.0 | 34.7 | 0.34 | 1.34 |
| SN-12 | Unnamed Spring #11 | 08/26/2005 | 7.85 | 60.1 | 11.4 | 11.4 | 1.56 | 8.3 | 11.1 | 231 | 0.0 | 19.1 | 0.06 | 0.08 |
| SN-13 | Eight Mile Spring | 08/26/2005 | 7.65 | 77.8 | 18.3 | 5.74 | 0.86 | 4.7 | 9.5 | 307 | 0.0 | 12.6 | <.05 | 0.03 |
| SN-14 | Unnamed Spring #12 | 10/25/2005 | 6.54 | 39.1 | 3.53 | 4.78 | 0.64 | 2.4 | 4.2 | 130 | 0.0 | 11.9 | 0.07 | <.02 |
| SN-15 | Mud Spring | 10/25/2005 | 7.51 | 73.4 | 14.5 | 3.02 | 0.64 | 2.5 | 5.4 | 287 | 0.0 | 10.0 | <.05 | <.02 |
| SN-16 | Unnamed Spring | 10/26/2005 | 3.12 | 71.3 | 30.4 | 8.93 | 0.75 | 6.6 | 35.4 | 322 | 0.0 | 12.6 | 0.08 | 0.05 |
| SN-17 | Unnamed Spring near Rock Spring | 10/26/2005 | 6.17 | 79.1 | 94.7 | 67.8 | 1.14 | 83.6 | 234 | 437 | 0.0 | 19.6 | 0.15 | 0.37 |
| SN-18 | Raised Spring | 10/27/2005 | 7.62 | 7.01 | 1.77 | 2.38 | 0.66 | 1.0 | 2.4 | 31.2 | 0.0 | 11.4 | 0.05 | <.02 |
| Sheep Range | | | | | | | | | | | | | | |
| SH-1 | Corn Creek Spring South | 01/17/2004 | 4.0 | 51.0 | 48.2 | 9.8 | 3.0 | 9.1 | 25.1 | 401 | 0 | 28.7 | -- | -- |
| SH-1 | Corn Creek Spring South | 06/30/2004 | 3.3 | 47.4 | 33.7 | 6.44 | 2.11 | 6.9 | 18.5 | 288 | 0 | 19.5 | -- | -- |
| SH-2 | Wiregrass Spring | 01/17/2004 | 2.3 | 45.3 | 35.0 | 3.3 | 1.2 | 4.0 | 8.5 | 513 | 0 | 16.9 | -- | -- |
| SH-2 | Wiregrass Spring | 06/30/2004 | 2.5 | 67.8 | 33.2 | 2.48 | 0.98 | 3.7 | 6.0 | 367 | 0 | 14.4 | -- | -- |
| SH-2 | Wiregrass Spring | 04/29/2005 | 3.95 | 74.4 | 40.6 | 3.92 | 1.27 | 3.9 | 5.4 | 404 | 0 | 14.8 | 0.10 | <.02 |
| SH-3 | White Rock Spring | 07/27/2004 | 1.7 | 41.8 | 35.1 | 18.2 | 11.9 | 10.8 | 12.7 | 326 | 0 | 57.7 | 0.21 | 0.16 |
| SH-3 | White Rock Spring | 04/28/2005 | 3.8 | 39.8 | 35.2 | 16.8 | 10.5 | 10.3 | 12.5 | 303 | 0 | 46.5 | 0.18 | 0.02 |
| SH-4 | Cow Camp Spring | 07/27/2004 | 5.1 | 48.9 | 35.6 | 26.9 | 0.55 | 23.5 | 24.6 | 312 | 0 | 17.6 | 0.11 | 0.26 |

Table A-2. Dissolved oxygen and water chemistry for springs in recharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter) (continued).

| Recharge Area and Site | Site Name | Sample Date | DO (mg/l) | Ca (mg/l) | Mg (mg/l) | Na (mg/l) | K (mg/l) | Cl (mg/l) | $SO_4$ | $HCO_3$-lab (mg/l) | $CO_3$-lab (mg/l) | $SiO_2$ (mg/l) | F (mg/l) | Br (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SH-4 | Cow Camp Spring | 04/28/2005 | 8.4 | 52.0 | 38.0 | 38.9 | 0.29 | 39.9 | 48.6 | 298 | 0 | 15.1 | 0.14 | 0.06 |
| SH-5 | Rye Patch Spring | 04/28/2005 | 8.1 | 49.5 | 24.2 | 16.0 | 1.98 | 17.5 | 22.0 | 218 | 0 | 13.7 | 0.10 | 0.03 |
| White Pine Range | | | | | | | | | | | | | | |
| WP-1 | Monitoring Spring WR-1 | 10/12/2003 | 8.7 | 56.7 | 10.0 | 2.5 | 0.6 | 1.1 | 4.3 | 229 | 0.0 | 7.4 | -- | -- |
| WP-1 | Monitoring Spring WR-1 | 03/23/2004 | 8.5 | 76.0 | 7.7 | 2.7 | 0.7 | 1.1 | 3.3 | 259 | 0.0 | 9.0 | -- | -- |
| WP-1 | Monitoring Spring WR-1 | 06/21/2004 | 9.7 | 60.5 | 9.88 | 2.09 | 0.54 | 1.0 | 3.8 | 219 | 0.0 | 7.8 | <.05 | <.02 |
| WP-1 | Monitoring Spring WR-1 | 09/22/2004 | 10.1 | 60.8 | 10.9 | 3.17 | 1.00 | 1.2 | 4.2 | 231 | 0.0 | 7.5 | 0.05 | <.02 |
| WP-1 | Monitoring Spring WR-1 | 01/21/2005 | 8.6 | 62.0 | 10.7 | 2.83 | 0.77 | 1.3 | 4.5 | 227 | 0.0 | 7.4 | 0.05 | <.02 |
| WP-1 | Monitoring Spring WR-1 | 05/21/2005 | 9.4 | 85.3 | 5.5 | 2.7 | 0.7 | 1.3 | 2.6 | 274 | 0.0 | 11.6 | 0.06 | <.02 |
| WP-1 | Monitoring Spring WR-1 | 08/14/2005 | 9.39 | 59.1 | 9.8 | 2.4 | 0.6 | 1.1 | 4.3 | 224 | 0.0 | 7.6 | 0.05 | <.02 |
| WP-1 | Monitoring Spring WR-1 | 11/05/2005 | 9.79 | 57.2 | 10.1 | 2.34 | 0.58 | 1.2 | 4.5 | 211 | 0.0 | 7.4 | 0.11 | <.02 |
| WP-1 | Monitoring Spring WR-1 | 02/24/2006 | 8.11 | 55.7 | 9.83 | 2.45 | 0.64 | 1.2 | 4.7 | 208 | -- | 7.3 | <.1 | <.02 |
| WP-2 | Saddle Spring | 10/12/2003 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | |
| WP-2 | Saddle Spring | 06/28/2005 | 6.85 | 26.3 | 5.1 | 17.4 | 0.9 | 7.8 | 12.4 | 117 | 0.0 | 34.5 | 0.14 | 0.06 |
| WP-3 | Unnamed Spring in dry ck bed | 10/12/2003 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| WP-4 | Deer Spring | 10/12/2003 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| WP-4 | Deer Spring | 06/28/2005 | 6.30 | 31.7 | 2.4 | 16.2 | 1.0 | 5.0 | 6.7 | 127 | 0.0 | 38.4 | 0.14 | 0.04 |
| WP-5 | Circle Wash Spring | 06/06/2005 | 7.07 | 17.1 | 4.4 | 9.6 | 1.8 | 2.7 | 8.1 | 81 | 0.0 | 35.5 | 0.15 | 0.02 |
| WP-6 | Stove Spring | 06/06/2005 | 7.13 | 27.9 | 6.8 | 14.5 | 3.3 | 7.9 | 13.0 | 123 | 0.0 | 53.2 | 0.18 | 0.05 |
| WP-7 | Little Tom Plain Spring | 06/06/2005 | 7.15 | 64.9 | 5.7 | 20.8 | 2.8 | 14.3 | 20.9 | 202 | 0.0 | 48.2 | 0.29 | 0.10 |
| WP-8 | Big Tom Plain Spring | 06/06/2005 | 6.10 | 92.5 | 5.9 | 20.4 | 7.2 | 19.0 | 22.1 | 300 | 0.0 | 48.2 | 0.21 | 0.13 |
| WP-9 | Sage Hen Spring | 06/06/2005 | 7.00 | 34.4 | 7.1 | 15.7 | 1.4 | 4.1 | 9.6 | 160 | 0.0 | 40.3 | 0.12 | 0.04 |
| WP-10 | Chicken Spring | 06/07/2005 | 5.72 | 56.0 | 5.1 | 12.7 | 1.6 | 7.7 | 10.9 | 196 | 0.0 | 38.5 | 0.15 | 0.06 |
| WP-11 | Unmarked Aspen Springs (North) | 06/07/2005 | 7.69 | 22.4 | 5.9 | 13.4 | 3.2 | 7.1 | 10.5 | 108 | 0.0 | 51.1 | 0.16 | 0.05 |
| WP-12 | Unnamed Stone Cabin Spring | 06/07/2005 | 8.15 | 67.6 | 12.2 | 14.6 | 1.0 | 8.2 | 12.6 | 261 | 0.0 | 18.5 | 0.23 | 0.04 |
| WP-13 | Unnamed Hayden Canyon Spring | 06/07/2005 | 6.01 | 65.6 | 9.3 | 20.6 | 1.6 | 12.1 | 24.3 | 148 | 0.0 | 16.0 | 0.52 | 0,07 |
| WP-14 | Shellback Spring | 06/07/2005 | 8.77 | 27.2 | 5.7 | 14.3 | 2.1 | 8.3 | 12.2 | 113 | 0.0 | 48.7 | 0.14 | 0.06 |
| WP-15 | Unnamed Shellback Ridge Spring | 06/07/2005 | 0.32 | 15.4 | 6.7 | 109 | 1.2 | 20.7 | 49.9 | 263 | 0.0 | 10.9 | 0.73 | 0.10 |
| WP-16 | Aspen Springs (South) | 06/07/2005 | 9.43 | 22.4 | 6.3 | 13.4 | 3.5 | 5.8 | 8.1 | 115 | 0.0 | 59.5 | 0.19 | 0.04 |
| WP-17 | Unnamed Spring #1 | 06/28/2005 | 8.93 | 24.9 | 4.7 | 14.8 | 0.87 | 7.2 | 11.4 | 107 | 0.0 | 32.5 | 0.14 | 0.04 |
| WP-18 | Unnamed Spring #2 | 06/28/2005 | 5.87 | 16.4 | 3.34 | 9.3 | 2.45 | 4.7 | 7.4 | 72.6 | 0.0 | 30.3 | 0.11 | 0.03 |
| WP-19 | Unnamed Spring #3 | 06/28/2005 | 2.90 | 33.7 | 6.8 | 14.1 | 1.5 | 2.8 | 2.8 | 159 | 0.0 | 45.5 | 0.23 | 0.04 |
| WP-20 | Unnamed Spring #4 | 06/29/2005 | 3.70 | 63.4 | 9.4 | 37.8 | 0.8 | 21.1 | 46.0 | 235 | 0.0 | 26.7 | 0.39 | 0.15 |
| WP-21 | Unnamed Spring #5 | 06/29/2005 | 7.00 | 62.2 | 5.4 | 14.9 | 1.1 | 6.5 | 10.2 | 220 | 0.0 | 30.5 | 0.18 | 0.05 |
| WP-22 | Unnamed Spring #6 | 06/29/2005 | 0.50 | 40.3 | 8.5 | 19.5 | 2.4 | 5.0 | 8.7 | 190 | 0.0 | 40.2 | 0.22 | 0.04 |

Table A-2. Dissolved oxygen and water chemistry for springs in recharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter) (continued).

| Recharge Area and Site | Site Name | Sample Date | DO (mg/l) | Ca (mg/l) | Mg (mg/l) | Na (mg/l) | K (mg/l) | Cl (mg/l) | $SO_4$ | $HCO_3$-lab (mg/l) | $CO_3$-lab (mg/l) | $SiO_2$ (mg/l) | F (mg/l) | Br (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WP-23 | Easter Spring | 06/29/2005 | 6.70 | 52.2 | 6.3 | 17.9 | 2.9 | 14.4 | 18.6 | 181 | 0.0 | 46.7 | 0.16 | 0.10 |
| WP-24 | Tunnel Spring | 07/01/2005 | 5.50 | 62.6 | 10.3 | 61.3 | 0.7 | 22.7 | 29.7 | 308 | 0.0 | 35.0 | 0.39 | 0.16 |
| WP-25 | Halfway Spring | 06/29/2005 | 2.60 | 100 | 21.2 | 37.6 | 1.9 | 14.7 | 21.1 | 448 | 0.0 | 56.6 | 0.27 | 0.22 |
| White Rock Mountains | | | | | | | | | | | | | | |
| WM-1 | Tobe Spring | 05/20/2004 | 8.0 | 49.6 | 7.8 | 25.3 | 3.2 | 20.9 | 20.5 | 89.1 | 49.1 | 45.6 | -- | -- |
| WM-2 | Tobe Spring 2 | 05/20/2004 | 4.0 | 38.2 | 5.7 | 17.1 | 3.4 | 14.8 | 7.0 | 157 | 0.0 | 47.0 | -- | -- |
| WM-3 | Unnamed Spring nr Redd's Cabin Summit | 05/21/2004 | 7.7 | 93.1 | 21.3 | 30.9 | 1.3 | 26.9 | 31.6 | 374 | 0.0 | 25.5 | -- | -- |
| WM-4 | Barrel Spring | 05/21/2004 | 6.2 | 55.7 | 6.1 | 16.5 | 0.5 | 18.8 | 10.7 | 193 | 0.0 | 22.9 | -- | -- |
| WM-5 | Lion Spring | 05/21/2004 | 8.2 | 37.0 | 7.0 | 17.2 | 3.8 | 36.1 | 15.3 | 124 | 0.0 | 56.6 | -- | -- |
| WM-6 | South Monument Spring | 05/21/2004 | 5.8 | 25.5 | 5.6 | 12.6 | 5.8 | 22.5 | 8.6 | 101 | 0.0 | 55.5 | -- | -- |
| WM-7 | Ripgut Sp #40 | 11/19/2005 | 5.67 | 25.2 | 4.58 | 18.2 | 8.17 | 17.0 | 6.4 | 116 | 0.0 | 63.5 | 0.15 | 0.09 |
| Wilson Creek Range | | | | | | | | | | | | | | |
| WC-1 | Headwaters Spring WR-5 | 05/19/2004 | 6.5 | 10.4 | 2.4 | 4.5 | 1.3 | 4.5 | 4.7 | 37.1 | 0.0 | 19.1 | -- | -- |
| WC-1 | Headwaters Spring WR-5 | 07/18/2004 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| WC-1 | Headwaters Spring WR-5 | 08/18/2004 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| WC-1 | Headwaters Spring WR-5 | 09/23/2004 | 7.05 | 11.2 | 2.51 | 4.79 | 1.21 | 4.2 | 4.4 | 37.2 | 0.0 | 20.4 | 0.06 | <.02 |
| WC-1 | Headwaters Spring WR-5 | 07/27/2005 | 6.23 | 11.8 | 2.6 | 5.0 | 1.1 | 4.5 | 3.3 | 49 | 0.0 | 21.3 | 0.07 | 0.02 |
| WC-1 | Headwaters Spring WR-5 | 08/13/2005 | 6.62 | 11.8 | 2.5 | 4.9 | 1.2 | 4.7 | 3.4 | 44 | 0.0 | 21.1 | 0.07 | 0.02 |
| WC-1 | Headwaters Spring WR-5 | 11/07/2005 | 5.97 | 13.8 | 3.00 | 5.43 | 1.34 | 6.2 | 4.4 | 46.9 | 0.0 | 21.4 | 0.06 | 0.03 |
| WC-2 | Bailey Spring | 05/18/2004 | 6.4 | 45.0 | 9.4 | 18.5 | 2.1 | 40.6 | 16.1 | 135 | 0.0 | 36.7 | -- | -- |
| WC-3 | Blue Rock Spring | 04/28/2004 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| WC-4 | Upper Tower Spring | 04/28/2004 | -- | 20.2 | 3.3 | 16.3 | 6.2 | 7.6 | 7.2 | 104 | 0.0 | 45.8 | -- | -- |
| WC-5 | Unnamed Spring in Miller Canyon | 05/19/2004 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| WC-6 | Horsethief Spring | 05/20/2004 | 1.6 | 56.6 | 8.0 | 16.5 | 1.2 | 18.6 | 13.0 | 206 | 0.0 | 50.1 | -- | -- |
| WC-6 | Horsethief Spring | 05/01/2005 | 1.9 | 76.5 | 10.6 | 27.6 | 0.50 | 19.5 | 13.5 | 293 | 0.0 | 60.3 | 0.25 | <.02 |

Table A-3. Stable isotopes for springs in recharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter).

| Recharge Area and Site | Site Name | Sample Date | $\delta^{18}O$ (‰) | $\delta D$ (‰) |
|---|---|---|---|---|
| Antelope Range | | | | |
| AR-1 | Tippet Spring | 08/24/2005 | -16.24 | -121.9 |
| AR-2 | Unnamed Spring #8 | 08/24/2005 | -15.85 | -121.4 |
| AR-3 | Unnamed Spring #9 | 08/25/2005 | -16.41 | -123.0 |
| AR-4 | Unnamed Spring #10 | 08/25/2005 | -15.95 | -122.0 |
| AR-5 | Dipping Tank Spring | 08/25/2005 | -15.74 | -119.8 |
| AR-6 | Rock Springs | 08/25/2005 | -15.17 | -118.4 |
| Buck Mountains | | | | |
| BK-1 | Mud Spring | 06/05/2005 | -15.21 | -117.6 |
| BK-2 | Woodchuck Spring | 06/05/2005 | -15.55 | -119.6 |
| BK-3 | Unnamed Near Little Willow Spring | 06/05/2005 | -17.04 | -125.9 |
| Butte Mountains | | | | |
| BT-1 | Butte Spring | 05/24/2005 | -15.79 | -120.4 |
| BT-2 | Sammy Spring | 05/24/2005 | -15.30 | -117.6 |
| BT-3 | White Rock Spring | 05/24/2005 | -15.36 | -119.2 |
| BT-4 | Summit Spring | 06/04/2005 | -15.94 | -120.8 |
| BT-5 | Robbers Roost No. 2 Spring | 06/04/2005 | -14.39 | -112.0 |
| BT-6 | Deer Spring | 06/04/2005 | -14.74 | -114.1 |
| BT-7 | Cabin Spring | 06/05/2005 | -15.89 | -124.4 |
| BT-8 | Indian Spring | 06/05/2005 | -15.31 | -119.1 |
| Cherry Creek Range | | | | |
| CC-1 | Johnson Spring | 05/24/2005 | -15.94 | -123.4 |
| CC-2 | Snow Creek Spring | 05/24/2005 | -16.22 | -120.7 |
| CC-3 | Lower Snow Creek Spring | 05/24/2005 | -16.24 | -120.9 |
| Clover Mountains | | | | |
| CR-1 | Garden Spring | 01/15/2004 | -11.54 | -87.0 |
| CR-2 | Unnamed Spring (Clover) | 01/15/2004 | -12.20 | -88.0 |
| CR-3 | Kershaw-Ryan Spring #1 | 03/27/2004 | -13.11 | -95.1 |
| CR-4 | Ella Spring | 03/27/2004 | -12.56 | -95.8 |
| CR-5 | Unnamed Spring nr Clover Creek | 07/31/2004 | -11.96 | -89.7 |
| CR-6 | Big Spring | 07/31/2004 | -12.89 | -94.2 |
| CR-6 | Big Spring | 04/30/2005 | -12.89 | -92.9 |
| CR-7 | Little Springs | 07/31/2004 | -12.78 | -93.0 |
| CR-7 | Little Springs | 04/30/2005 | -12.84 | -93.5 |
| CR-8 | Quaking Aspen Spring | 07/31/2004 | -12.98 | -93.6 |
| CR-9 | Sheep Spring | 07/31/2004 | -12.06 | -90.5 |
| CR-10 | Cave Spring | 07/31/2004 | -12.21 | -90.8 |

Table A-3. Stable isotopes for springs in recharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter) (continued).

| Recharge Area and Site | Site Name | Sample Date | $\delta^{18}O$ (‰) | $\delta D$ (‰) |
|---|---|---|---|---|
| CR-11 | Cave Spring | 07/31/2004 | -12.53 | -94.7 |
| CR-12 | East Settling Spring | 07/31/2004 | -12.76 | -92.2 |
| Delamar Mountains | | | | |
| DR-1 | Red Rock Spring | 01/10/2004 | -12.30 | -95.0 |
| DR-2 | Willow Spring (KSV-1) | 01/12/2004 | -11.57 | -88.0 |
| DR-2 | Willow Spring (KSV-1) | 04/27/2005 | -11.63 | -89.1 |
| DR-3 | Boulder Spring (KSV-4) | 01/13/2004 | -12.60 | -91.0 |
| DR-3 | Boulder Spring (KSV-4) | 04/27/2005 | -12.66 | -91.3 |
| DR-4 | Kane Springs (KSV-3) | 01/13/2004 | -11.88 | -87.0 |
| DR-5 | Upper Riggs Spring WR-4 | 01/13/2004 | -11.90 | -87.0 |
| DR-5 | Upper Riggs Spring WR-4 | 04/29/2004 | -11.95 | -86.6 |
| DR-5 | Upper Riggs Spring WR-4 | 10/19/2004 | -11.55 | -86.2 |
| DR-5 | Upper Riggs Spring WR-4 | 02/10/2005 | -12.46 | -87.0 |
| DR-5 | Upper Riggs Spring WR-4 | 05/19/2005 | -14.45 | -104.4 |
| DR-6 | Bishop Spring | 01/14/2004 | -11.67 | -88.0 |
| DR-6 | Bishop Spring | 05/20/2005 | -11.78 | -88.1 |
| DR-7 | Lower Indian Spring | 01/14/2004 | -12.62 | -96.0 |
| DR-8 | Upper Indian Spring | 01/14/2004 | -11.46 | -88.0 |
| DR-9 | Oak Spring | 01/16/2004 | -11.87 | -90.0 |
| DR-10 | Narrow Spring | 03/22/2004 | -12.47 | -92.5 |
| DR-11 | Sawmill Spring West | 03/22/2004 | -12.86 | -91.8 |
| DR-12 | Sawmill Spring | 03/22/2004 | -12.58 | -88.7 |
| DR-13 | Willow Spring 2 (So. of Oak Spring summit) | 03/25/2004 | -11.69 | -91.2 |
| DR-14 | Lower Chokecherry Spring | 03/25/2004 | -12.98 | -98.4 |
| DR-15 | Upper Chokecherry Spring | 03/25/2004 | -12.96 | -98.9 |
| DR-16 | Unnamed Chokecherry Spring | 03/25/2004 | -12.54 | -98.1 |
| DR-17 | Buckboard Spring | 03/26/2004 | -11.71 | -88.2 |
| DR-18 | Cottonwood Spring | 03/26/2004 | -12.87 | -96.9 |
| DR-19 | Abandoned Spring | 03/26/2004 | -12.32 | -94.5 |
| DR-20 | Grassy Spring | 03/26/2004 | -11.23 | -90.9 |
| DR-20 | Grassy Spring | 04/27/2005 | -11.10 | -90.1 |
| Egan Range | | | | |
| ER-1 | Upper Terrace Spring WR-2 | 10/13/2003 | -15.43 | -111.3 |
| ER-1 | Upper Terrace Spring WR-2 | 10/15/2003 | -15.43 | -114.9 |
| ER-1 | Upper Terrace Spring WR-2 | 04/26/2004 | -15.44 | -111.8 |
| ER-1 | Upper Terrace Spring WR-2 | 06/23/2004 | -15.40 | -115.6 |
| ER-1 | Upper Terrace Spring WR-2 | 09/22/2004 | -15.35 | -114.4 |
| ER-1 | Upper Terrace Spring WR-2 | 02/09/2005 | -15.41 | -114.6 |
| ER-1 | Upper Terrace Spring WR-2 | 05/21/2005 | -15.24 | -113.7 |

Table A-3. Stable isotopes for springs in recharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter) (continued).

| Recharge Area and Site | Site Name | Sample Date | $\delta^{18}O$ (‰) | $\delta D$ (‰) |
|---|---|---|---|---|
| ER-1 | Upper Terrace Spring WR-2 | 08/11/2005 | -15.43 | -113.4 |
| ER-1 | Upper Terrace Spring WR-2 | 11/06/2005 | -15.40 | -114.0 |
| ER-2 | Water Canyon Spring | 10/14/2003 | -15.60 | -114.4 |
| ER-3 | Lone Pine Spring | 10/13/2003 | -14.98 | -109.2 |
| ER-4 | Big Spring | 10/14/2003 | -13.92 | -104.2 |
| ER-4 | Big Spring | 07/31/2005 | -13.98 | -106.1 |
| ER-5 | Water Canyon at USGS gage | 10/24/2003 | -15.41 | -109.5 |
| ER-5 | Water Canyon at USGS gage (duplicate sample) | 10/24/2003 | -15.43 | -112.7 |
| ER-6 | Unnamed Spring 1 | 05/24/2005 | -15.63 | -118.9 |
| ER-7 | Silver Spring | 07/29/2005 | -14.74 | -111.9 |
| ER-8 | Hole in the Bank Spring | 07/31/2005 | -15.37 | -114.9 |
| ER-9 | Haggerty Spring | 07/31/2005 | -14.78 | -109.6 |
| ER-10 | Perry Spring | 10/28/2005 | -15.04 | -107.7 |
| Fairview Range | | | | |
| FR-1 | Scotty Spring | 06/26/2004 | -12.73 | -98.9 |
| FR-2 | Littlefield Spring | 06/26/2004 | -12.73 | -98.5 |
| FR-3 | Meloy Spring | 06/26/2004 | -12.75 | -99.8 |
| FR-4 | McDermitt Spring | 06/26/2004 | -11.21 | -94.3 |
| FR-5 | Bailey Spring | 06/29/2004 | -12.68 | -98.5 |
| FR-5 | Bailey Spring | 05/01/2005 | -12.70 | -97.9 |
| FR-6 | Fence Spring | 06/29/2004 | -12.55 | -97.4 |
| FR-7 | Robinson Spring | 06/29/2004 | -12.34 | -97.9 |
| FR-8 | Upper Fairview | 06/29/2004 | -12.66 | -97.7 |
| FR-9 | Lower Fairview | 06/29/2004 | -12.39 | -97.5 |
| FR-10 | Fox Cabin | 06/29/2004 | -13.59 | -103.5 |
| FR-11 | Cottonwood Spring | 06/29/2004 | -13.40 | -102.2 |
| Fortification Range | | | | |
| FO-1 | Indian Springs | 07/29/2005 | -14.16 | -106.3 |
| Grant Range | | | | |
| GR-1 | Brady Spring | 10/28/2003 | -15.38 | -108.5 |
| GR-1 | Brady Spring (duplicate sample) | 10/28/2003 | -15.38 | -110.4 |
| GR-2 | Little Spring | 06/30/2005 | -12.48 | -99.4 |
| GR-3 | Horse Spring | 06/30/2005 | -12.86 | -99.5 |
| GR-4 | Teaspoon Spring | 06/30/2005 | -13.26 | -100.0 |
| GR-5 | Wiregrass Spring | 06/30/2005 | -13.29 | -101.4 |
| GR-6 | Murphy Spring | 07/02/2005 | -15.40 | -114.5 |

Table A-3. Stable isotopes for springs in recharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter) (continued).

| Recharge Area and Site | Site Name | Sample Date | $\delta^{18}O$ (‰) | $\delta D$ (‰) |
|---|---|---|---|---|
| Highland Range | | | | |
| HR-1 | Highland Spring | 06/24/2004 | -13.49 | -99.6 |
| HR-1 | Highland Spring | 05/01/2005 | -13.30 | -99.3 |
| HR-2 | Deadman Spring | 06/24/2004 | -10.83 | -90.9 |
| HR-3 | Lime Spring | 06/24/2004 | -13.41 | -99.9 |
| HR-4 | Pine Spring | 06/24/2004 | -13.33 | -99.0 |
| HR-5 | Connor Spring | 06/24/2004 | -13.84 | -100.6 |
| HR-6 | Big Trees Spring | 06/24/2004 | -13.88 | -102.3 |
| Indian Peak Range | | | | |
| IP-1 | Ryans Spring D 38 | 11/19/2005 | -13.68 | -103.5 |
| IP-2 | Merril's Camp D 39 | 11/19/2005 | -14.13 | -102.1 |
| Kern Mountains | | | | |
| KM-1 | Mike's Spring | 08/23/2005 | -15.89 | -121.1 |
| KM-2 | Unnamed Spring #7 | 08/23/2005 | -15.80 | -116.3 |
| KM-3 | Grass Valley Springs | 08/23/2005 | -16.72 | -124.7 |
| KM-4 | Cedar Spring | 08/23/2005 | -15.52 | -121.5 |
| Mountain Home Range | | | | |
| MH-1 | Cobb Spring | 07/28/2005 | -13.87 | -103.7 |
| Meadow Valley Mountains | | | | |
| MM-1 | Grapevine Spring WR-7 | 04/27/2005 | -11.90 | -88.6 |
| MM-1 | Grapevine Spring WR-7 | 08/16/2005 | -11.95 | -85.2 |
| MM-1 | Grapevine Spring WR-7 | 11/09/2005 | -11.89 | -87.7 |
| MM-1 | Grapevine Spring WR-7 | 02/16/2006 | -12.00 | -87.3 |
| Mount Irish Range | | | | |
| MI-1 | Littlecut Spring | 06/25/2004 | -12.93 | -98.4 |
| MI-1 | Littlecut Spring | 05/02/2005 | -12.76 | -98.2 |
| MI-2 | Henry Spring | 06/25/2004 | -12.77 | -97.4 |
| MI-3 | Cold Spring | 06/25/2004 | -12.98 | -98.9 |
| MI-4 | Reed Spring | 06/25/2004 | -14.24 | -98.4 |
| Pahroc Ranges | | | | |
| PR-1 | Pahroc Spring | 01/16/2004 | -12.65 | -94.0 |
| PR-1 | Pahroc Spring | 04/30/2005 | -12.79 | -93.5 |
| PR-2 | Hamilton Spring | 03/23/2004 | -11.76 | -93.1 |
| PR-3 | Blackrock Spring | 03/23/2004 | -12.36 | -93.6 |
| PR-4 | Unnamed Spring nr Blackrock | 03/23/2004 | -11.90 | -94.3 |
| PR-5 | Deadman Spring | 03/23/2004 | -10.84 | -86.9 |
| PR-5 | Deadman Spring (duplicate sample) | 03/23/2004 | -10.92 | -88.7 |

Table A-3. Stable isotopes for springs in recharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter) (continued).

| Recharge Area and Site | Site Name | Sample Date | $\delta^{18}O$ (‰) | $\delta D$ (‰) |
|---|---|---|---|---|
| PR-6 | Little Boulder Spring | 03/24/2004 | -13.06 | -97.2 |
| PR-7 | Mustang Spring | 03/24/2004 | -12.37 | -90.0 |
| PR-8 | Rattlesnake Spring | 03/24/2004 | -12.65 | -97.3 |
| PR-9 | Unnamed Spring in Road | 07/30/2004 | -13.07 | -96.7 |
| PR-10 | Twin Spring | 07/30/2004 | -13.24 | -97.4 |
| PR-11 | Eightmile Spring | 07/30/2004 | -13.12 | -96.7 |
| PR-11 | Eightmile Spring | 04/30/2005 | -13.06 | -94.4 |
| PR-12 | Unnamed Spring nr Sixmile seep | 07/30/2004 | -12.62 | -94.5 |
| PR-13 | Water Tank 0.4mi west of Sixmile | 07/30/2004 | -12.44 | -93.8 |
| Schell Creek Range | | | | |
| SC-1 | Spring Schell Creek 1 | 10/29/2003 | -14.40 | -108.1 |
| SC-1 | Spring Schell Creek 1 (duplicate sample) | 10/29/2003 | -14.46 | -105.8 |
| SC-1 | Spring Schell Creek 1( Unnamed Spring #3) | 07/30/2005 | -14.61 | -106.9 |
| SC-2 | Patterson Pass Spring WR-3 | 10/30/2003 | -14.91 | -106.5 |
| SC-2 | Patterson Pass Spring WR-3 (duplicate sample) | 10/30/2003 | -14.94 | -109.2 |
| SC-2 | Patterson Pass Spring WR-3 | 03/24/2004 | -14.75 | -106.2 |
| SC-2 | Patterson Pass Spring WR-3 | 06/23/2004 | -14.84 | -109.1 |
| SC-2 | Patterson Pass Spring WR-3 | 09/23/2004 | -14.79 | -107.9 |
| SC-2 | Patterson Pass Spring WR-3 | 01/23/2005 | -14.77 | -108.3 |
| SC-2 | Patterson Pass Spring WR-3 | 05/20/2005 | -14.71 | -106.8 |
| SC-2 | Patterson Pass Spring WR-3 | 08/15/2005 | -14.83 | -107.6 |
| SC-2 | Patterson Pass Spring WR-3 | 11/07/2005 | -14.87 | -107.5 |
| SC-2 | Patterson Pass Spring WR-3 | 02/26/2006 | -14.90 | -106.9 |
| SC-3 | Kalamazoo Spring WR-6 | 07/20/2004 | -16.22 | -121.6 |
| SC-3 | Kalamazoo Spring WR-6 | 09/21/2004 | -16.22 | -118.5 |
| SC-3 | Kalamazoo Spring WR-6 | 01/23/2005 | -16.28 | -121.6 |
| SC-3 | Kalamazoo Spring WR-6 | 05/23/2005 | -16.13 | -118.6 |
| SC-3 | Kalamazoo Spring WR-6 | 08/12/2005 | -16.18 | -119.2 |
| SC-3 | Kalamazoo Spring WR-6 | 11/08/2005 | -16.17 | -121.0 |
| SC-3 | Kalamazoo Spring WR-6 | 02/25/2006 | -16.22 | -119.3 |
| SC-5 | Robbers Roost Spring | 07/31/2005 | -14.75 | -109.7 |
| SC-6 | Sidehill Spring | 08/01/2005 | -13.37 | -100.8 |
| Seaman Range | | | | |
| SE-1 | Seaman Spring | 06/25/2004 | -13.13 | -99.0 |
| SE-2 | Oreana Spring | 06/25/2004 | -10.74 | -90.9 |

Table A-3. Stable isotopes for springs in recharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter) (continued).

| Recharge Area and Site | Site Name | Sample Date | $\delta^{18}O$ (‰) | $\delta D$ (‰) |
|---|---|---|---|---|
| Snake Range | | | | |
| SN-1 | Unnamed Spring #4 | 07/28/2005 | -14.65 | -107.2 |
| SN-2 | Unnamed Spring #5 | 07/28/2005 | -14.04 | -106.7 |
| SN-3 | Unnamed Spring #3 | 07/13/2005 | -14.07 | -109.0 |
| SN-4 | Cedar Cabin Spring | 07/13/2005 | -14.13 | -105.8 |
| SN-5 | Decathon Spring | 07/14/2005 | -14.59 | -106.8 |
| SN-6 | Mustang Spring | 07/14/2005 | -15.30 | -110.9 |
| SN-7 | South Spring | 07/14/2005 | -14.72 | -108.2 |
| SN-8 | Spring Creek Spring | 07/16/2005 | -15.41 | -113.4 |
| SN-9 | Unnamed Spring #1 | 07/13/2005 | -14.30 | -107.5 |
| SN-10 | Unnamed Spring #2 | 07/13/2005 | -14.59 | -109.9 |
| SN-11 | Cain Springs | 08/26/2005 | -10.85 | -98.4 |
| SN-12 | Unnamed Spring #11 | 08/26/2005 | -15.65 | -117.1 |
| SN-13 | Eight Mile Spring | 08/26/2005 | -15.53 | -116.3 |
| SN-14 | Unnamed Spring #12 | 10/25/2005 | -15.89 | -116.6 |
| SN-15 | Mud Spring | 10/25/2005 | -15.43 | -117.1 |
| SN-16 | Unnamed Spring | 10/26/2005 | -15.38 | -115.7 |
| SN-17 | Unnamed Spring near Rock Spring | 10/26/2005 | -14.76 | -114.3 |
| SN-18 | Raised Spring | 10/27/2005 | -13.54 | -103.7 |
| Sheep Range | | | | |
| SH-1 | Corn Creek Spring South | 01/17/2004 | -12.88 | -95.0 |
| SH-1 | Corn Creek Spring South | 06/30/2004 | -12.89 | -95.0 |
| SH-2 | Wiregrass Spring | 01/17/2004 | -12.87 | -94.0 |
| SH-2 | Wiregrass Spring | 06/30/2004 | -13.12 | -96.8 |
| SH-2 | Wiregrass Spring | 04/29/2005 | -13.76 | -101.2 |
| SH-3 | White Rock Spring | 07/27/2004 | -9.96 | -84.8 |
| SH-3 | White Rock Spring | 04/28/2005 | -10.38 | -86.1 |
| SH-4 | Cow Camp Spring | 07/27/2004 | -12.46 | -92.0 |
| SH-4 | Cow Camp Spring | 04/28/2005 | -12.47 | -91.9 |
| SH-5 | Rye Patch Spring | 04/28/2005 | -12.31 | -89.3 |
| White Pine Range | | | | |
| WP-1 | Monitoring Spring WR-1 | 10/12/2003 | -15.58 | -111.2 |
| WP-1 | Monitoring Spring WR-1 | 03/23/2004 | -15.32 | -113.3 |
| WP-1 | Monitoring Spring WR-1 | 06/21/2004 | -15.62 | -114.0 |
| WP-1 | Monitoring Spring WR-1 | 09/22/2004 | -15.51 | -115.7 |
| WP-1 | Monitoring Spring WR-1 | 01/21/2005 | -15.58 | -115.1 |
| WP-1 | Monitoring Spring WR-1 | 05/21/2005 | -15.55 | -112.3 |
| WP-1 | Monitoring Spring WR-1 | 08/14/2005 | -15.63 | -113.2 |

Table A-3. Stable isotopes for springs in recharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter) (continued).

| Recharge Area and Site | Site Name | Sample Date | $\delta^{18}O$ (‰) | $\delta D$ (‰) |
|---|---|---|---|---|
| WP-1 | Monitoring Spring WR-1 | 11/05/2005 | -15.65 | -113.8 |
| WP-1 | Monitoring Spring WR-1 | 02/24/2006 | -15.69 | -113.8 |
| WP-2 | Saddle Spring | 10/12/2003 | -15.70 | -115.7 |
| WP-2 | Saddle Spring | 06/28/2005 | -15.66 | -118.6 |
| WP-3 | Unnamed Spring in dry creek bed | 10/12/2003 | -15.31 | -113.6 |
| WP-4 | Deer Spring | 10/12/2003 | -15.87 | -118.9 |
| WP-4 | Deer Spring | 06/28/2005 | -15.87 | -119.6 |
| WP-5 | Circle Wash Spring | 06/06/2005 | -15.30 | -114.5 |
| WP-6 | Stove Spring | 06/06/2005 | -15.71 | -114.5 |
| WP-7 | Little Tom Plain Spring | 06/06/2005 | -15.87 | -121.8 |
| WP-8 | Big Tom Plain Spring | 06/06/2005 | -15.92 | -121.1 |
| WP-9 | Sage Hen Spring | 06/06/2005 | -14.76 | -112.4 |
| WP-10 | Chicken Spring | 06/07/2005 | -16.17 | -122.0 |
| WP-11 | Unmarked Aspen Springs (north) | 06/07/2005 | -15.84 | -119.3 |
| WP-12 | Unnamed Stone Cabin Spring | 06/07/2005 | -15.31 | -114.2 |
| WP-13 | Unnamed Hayden Canyon Spring | 06/07/2005 | -15.69 | -120.9 |
| WP-14 | Shellback Spring | 06/07/2005 | -16.54 | -123.6 |
| WP-15 | Unnamed Shellback Ridge Spring | 06/07/2005 | -16.18 | -123.6 |
| WP-16 | Aspen Springs(South) | 06/07/2005 | -16.02 | -120.9 |
| WP-17 | Unnamed Spring #1 | 06/28/2005 | -15.36 | -114.8 |
| WP-18 | Unnamed Spring #2 | 06/28/2005 | -15.66 | -114.9 |
| WP-19 | Unnamed Spring #3 | 06/28/2005 | -14.96 | -113.1 |
| WP-20 | Unnamed Spring #4 | 06/29/2005 | -15.01 | -116.3 |
| WP-21 | Unnamed Spring #5 | 06/29/2005 | -16.01 | -120.4 |
| WP-22 | Unnamed Spring #6 | 06/29/2005 | -14.98 | -115.1 |
| WP-23 | Easter Spring | 06/29/2005 | -15.56 | -119.4 |
| WP-24 | Tunnel Spring | 07/01/2005 | -15.02 | -118.3 |
| WP-25 | Halfway Spring | 06/29/2005 | -13.35 | -108.4 |
| White Rock Mountains | | | | |
| WM-1 | Tobe Spring | 05/20/2004 | -13.04 | -100.0 |
| WM-2 | Tobe Spring 2 | 05/20/2004 | -12.09 | -93.6 |
| WM-3 | Unnamed Spring nr Redd's Cabin Summit | 05/21/2004 | -12.37 | -93.7 |
| WM-4 | Barrel Spring | 05/21/2004 | -13.36 | -100.5 |
| WM-5 | Lion Spring | 05/21/2004 | -14.11 | -103.4 |
| WM-6 | South Monument Spring | 05/21/2004 | -14.23 | -102.3 |
| WM-7 | Ripgut Sp #40 | 11/19/2005 | -14.38 | -106.4 |

Table A-3. Stable isotopes for springs in recharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter) (continued).

| Recharge Area and Site | Site Name | Sample Date | $\delta^{18}O$ (‰) | $\delta D$ (‰) |
|---|---|---|---|---|
| Wilson Creek Range | | | | |
| WC-1 | Headwaters Spring WR-5 | 05/19/2004 | -14.65 | -106.9 |
| WC-1 | Headwaters Spring WR-5 | 07/18/2004 | -14.67 | -108.7 |
| WC-1 | Headwaters Spring WR-5 | 09/23/2004 | -14.67 | -108.8 |
| WC-1 | Headwaters Spring WR-5 | 07/27/2005 | -15.01 | -110.4 |
| WC-1 | Headwaters Spring WR-5 | 08/13/2005 | -14.99 | -109.6 |
| WC-1 | Headwaters Spring WR-5 | 11/07/2005 | -14.70 | -108.0 |
| WC-2 | Bailey Spring | 05/18/2004 | -12.93 | -102.0 |
| WC-3 | Blue Rock Spring | 04/28/2004 | -12.68 | -93.4 |
| WC-4 | Upper Tower Spring | 04/28/2004 | -12.30 | -93.3 |
| WC-5 | Unnamed Spring in Miller Canyon | 05/19/2004 | -14.27 | -103.7 |
| WC-6 | Horsethief Spring | 05/20/2004 | -12.73 | -96.3 |
| WC-6 | Horsethief Spring | 05/01/2005 | -12.62 | -97.6 |

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## APPENDIX B. Isotopic Data for Precipitation at the Recharge Area Spring Monitoring Sites

Table B-1. Isotopic data for precipitation at the recharge area spring monitoring sites (-- indicates samples not analyzed for this parameter).

| Recharge Area and Site | DRI Lab # | Site Name | Sample Date | Sample Time | Latitude dec deg | Longitude dec deg | Altitude (ft) | $\delta^{18}O$ (‰) | δD (‰) |
|---|---|---|---|---|---|---|---|---|---|
| DR-5 | 61614B | Upper Riggs Spring WR-4 PPT (precipitation) | 10/19/2004 | 15:20 | 37.36833 | 114.64778 | 5,163 | -8.12 | -61.8 |
| DR-5 | 62034A | Upper Riggs Spring WR-4 PPT (precipitation) | 02/10/2005 | 14:37 | 37.36833 | 114.64778 | 5,163 | -11.86 | -85.6 |
| DR-5 | 62635B | Upper Riggs Spring WR-4 PPT (precipitation) | 05/19/2005 | 10:15 | 37.36833 | 114.64778 | 5,163 | -12.03 | -87.3 |
| ER-1 | -- | Upper Terrace WR-2 PPT (precipitation) | 04/26/2004 | 14:14 | 39.08664 | 114.92565 | 8,747 | -16.93 | -121.6 |
| ER-1 | 61479A | Upper Terrace WR-2 PPT (precipitation) | 09/22/2004 | 9:36 | 39.08664 | 114.92565 | 8,747 | -13.15 | -93.5 |
| ER-1 | 62030A | Upper Terrace WR-2 PPT (precipitation) | 02/09/2005 | 13:07 | 39.08664 | 114.92565 | 8,747 | -16.53 | -117.7 |
| ER-1 | 62633B | Upper Terrace WR-2 PPT (precipitation) | 05/21/2005 | -- | 39.08664 | 114.92565 | 8,747 | -17.59 | -127.6 |
| ER-1 | 63652B | Upper Terrace WR-2 PPT (precipitation) | 11/07/2005 | 10:00 | 39.08664 | 114.92565 | 8,747 | -11.70 | -79.1 |
| ER-1 | 64734B | Upper Terrace WR-2 PPT (precipitation) | 05/24/2006 | 8:26 | 39.08664 | 114.92565 | 8,747 | -16.30 | -116.4 |
| ER-1 | 62633C | Upper Terrace WR-2 Lower PPT (precipitation) | 05/21/2005 | -- | 39.17698 | 115.00107 | 6,926 | -16.34 | -117.2 |
| ER-1 | -- | Upper Terrace WR-2 Lower PPT (precipitation) | 08/12/2005 | -- | 39.17698 | 115.00107 | 6,926 | -10.58 | -72.5 |
| ER-1 | 63652A | Upper Terrace WR-2 Lower PPT (precipitation) | 11/06/2005 | 6:36 | 39.17698 | 115.00107 | 6,926 | -8.79 | -56.0 |
| ER-1 | 64734A | Upper Terrace WR-2 Lower PPT (precipitation) | 05/20/2006 | 14:38 | 39.17698 | 115.00107 | 6,926 | -16.24 | -117.0 |
| ER-1 | 63652C | Upper Terrace WR-2 Snowsotopoter | 11/07/2005 | 10:00 | 39.08664 | 114.92565 | 8,747 | -6.97 | -52.6 |
| ER-1 | 64734C | Upper Terrace WR-2 Snowsotopoter | 05/24/2006 | 8:26 | 39.08664 | 114.92565 | 8,747 | -14.33 | -107.8 |
| MM-1 | -- | Grapevine Spring WR-7 PPT (precipitation) | 08/16/2005 | -- | 37.12957 | 114.70963 | 3,649 | -6.32 | -45.1 |
| MM-1 | 63573A | Grapevine Spring WR-7 PPT (precipitation) | 11/09/2005 | 12:30 | 37.12957 | 114.70963 | 3,649 | -9.68 | -65.2 |
| MM-1 | 64171B | Grapevine Spring WR-7 PPT (precipitation) | 02/16/2006 | 12:30 | 37.12957 | 114.70963 | 3,649 | -9.37 | -63.6 |
| MM-1 | 64171A | Grapevine Spring WR-7 PPT (precipitation) | 05/22/2006 | 12:00 | 37.12957 | 114.70963 | 3,649 | -11.82 | -83.8 |
| SC-2 | -- | Patterson Pass Spring WR-3 PPT (precipitation) | 03/24/2004 | 11:28 | 38.60280 | 114.71488 | 7,484 | -16.25 | -114.4 |
| SC-2 | -- | Patterson Pass Spring WR-3 PPT (precipitation) | 04/27/2004 | 17:26 | 38.60280 | 114.71488 | 7,484 | -15.37 | -107.6 |
| SC-2 | 61480A | Patterson Pass Spring WR-3 PPT (precipitation) | 09/23/2004 | -- | 38.60280 | 114.71488 | 7,484 | -9.53 | -69.3 |
| SC-2 | 62634B | Patterson Pass Spring WR-3 PPT (precipitation) | 05/20/2005 | -- | 38.60280 | 114.71488 | 7,484 | -15.57 | -110.5 |
| SC-2 | -- | Patterson Pass Spring WR-3 PPT (precipitation) | 08/15/2005 | -- | 38.60280 | 114.71488 | 7,484 | -7.12 | -50.3 |
| SC-2 | 63566A | Patterson Pass Spring WR-3 PPT (precipitation) | 11/07/2005 | 16:00 | 38.60280 | 114.71488 | 7,484 | -11.11 | -74.9 |
| SC-2 | 64239B | Patterson Pass Spring WR-3 PPT (precipitation) | 02/26/2006 | 9:30 | 38.60280 | 114.71488 | 7,484 | -13.77 | -97.3 |
| SC-2 | 64738A | Patterson Pass Spring WR-3 PPT (precipitation) | 05/23/2006 | 7:30 | 38.60280 | 114.71488 | 7,484 | -14.99 | -105.6 |
| SC-2 | 63566B | Patterson Pass Spring WR-3 Snowsotopoter | 11/07/2005 | 16:00 | 38.60280 | 114.71488 | 7,484 | -9.45 | -65.1 |
| SC-2 | 64239C | Patterson Pass Spring WR-3 Snowsotopoter | 02/26/2006 | 9:30 | 38.60280 | 114.71488 | 7,484 | -13.48 | -95.9 |
| SC-2 | 64738B | Patterson Pass Spring WR-3 Snowsotopoter | 05/23/2006 | 7:30 | 38.60280 | 114.71488 | 7,484 | -14.89 | -105.1 |

Table B-1. Isotopic data for precipitation at the recharge area spring monitoring sites (-- indicates samples not analyzed for this parameter) (continued).

| Recharge Area and Site | DRI Lab # | Site Name | Sample Date | Sample Time | Latitude dec deg | Longitude dec deg | Altitude (ft) | $\delta^{18}O$ (‰) | $\delta D$ (‰) |
|---|---|---|---|---|---|---|---|---|---|
| SC-3 | 61348 | Kalamazoo Spring WR-6 PPT (precipitation) | 09/21/2004 | 11:39 | 39.56648 | 114.59594 | 7,221 | -10.18 | -72.3 |
| SC-3 | 61348-2 | Kalamazoo Spring WR-6 PPT (Duplicate) | 09/21/2004 | 11:39 | 39.56648 | 114.59594 | 7,221 | -10.13 | -69.0 |
| SC-3 | 61966A | Kalamazoo Spring WR-6 PPT (precipitation) | 01/23/2005 | 9:56 | 39.56648 | 114.59594 | 7,221 | -17.78 | -128.8 |
| SC-3 | 62636B | Kalamazoo Spring WR-6 PPT (precipitation) | 05/23/2005 | -- | 39.56648 | 114.59594 | 7,222 | -17.27 | -125.8 |
| SC-3 | -- | Kalamazoo Spring WR-6 PPT (precipitation) | 08/12/2005 | -- | 39.56648 | 114.59594 | 7,221 | -11.86 | -83.1 |
| SC-3 | 63567A | Kalamazoo Spring WR-6 PPT (precipitation) | 11/08/2005 | 8:30 | 39.56648 | 114.59594 | 7,221 | -10.09 | -69.7 |
| SC-3 | 64236B | Kalamazoo Spring WR-6 PPT (precipitation) | 02/25/2006 | 10:00 | 39.56648 | 114.59594 | 7,221 | -15.93 | -115.6 |
| SC-3 | 64739A | Kalamazoo Spring WR-6 PPT (precipitation) | 05/21/2006 | 7:58 | 39.56648 | 114.59594 | 7,221 | -16.30 | -117.3 |
| SC-3 | 63567B | Kalamazoo Spring WR-6 Snowsotopoter | 11/08/2005 | 9:00 | 39.56648 | 114.59594 | 7,221 | -10.20 | -72.0 |
| SC-3 | 64739B | Kalamazoo Spring WR-6 Snowsotopoter | 05/21/2006 | 7:58 | 39.56648 | 114.59594 | 7,221 | -16.02 | -117.8 |
| WP-1 | -- | Monitoring Spring WR-1 PPT (precipitation) | 03/23/2004 | 12:25 | 38.94965 | 115.40819 | 8,012 | -17.13 | -124.1 |
| WP-1 | 61478A | Monitoring Spring WR-1 PPT (precipitation) | 09/22/2004 | 14:46 | 38.94965 | 115.40819 | 8,012 | -11.95 | -87.8 |
| WP-1 | 62632B | Monitoring Spring WR-1 PPT (precipitation) | 05/21/2005 | -- | 38.94965 | 115.40819 | 8,012 | -16.19 | -112.9 |
| WP-1 | -- | Monitoring Spring WR-1 PPT (precipitation) | 08/14/2005 | -- | 38.94965 | 115.40819 | 8,012 | -11.79 | -82.1 |
| WP-1 | 63561A | Monitoring Spring WR-1 PPT (precipitation) | 11/05/2005 | 16:00 | 38.94965 | 115.40819 | 8,012 | -8.95 | -58.5 |
| WP-1 | 64733A | Monitoring Spring WR-1 PPT (precipitation) | 05/20/2006 | 10:00 | 38.94965 | 115.40819 | 8,012 | -15.12 | -107.8 |
| WP-1 | 63561B | Monitoring Spring WR-1 Snowsotopoter | 11/05/2005 | 16:30 | 38.94965 | 115.40819 | 8,012 | -4.01 | -37.3 |
| WP-1 | 64235C | Monitoring Spring WR-1 Snowsotopoter | 02/24/2006 | 12:02 | 38.94965 | 115.40819 | 8,012 | -9.36 | -75.1 |
| WP-1 | 64733B | Monitoring Spring WR-1 Snowsotopoter | 05/20/2006 | 10:00 | 38.94965 | 115.40819 | 8,012 | -10.99 | -84.9 |
| WC-1 | 61481A | Headwaters Spring WR-5 PPT (precipitation) | 09/23/2004 | -- | 38.36575 | 114.31935 | 8,000 | -9.84 | -68.5 |
| WC-1 | -- | Headwaters Spring WR-5 PPT (precipitation) | 08/13/2005 | -- | 38.36575 | 114.31935 | 8,000 | -10.62 | -68.5 |
| WC-1 | 63565A | Headwaters Spring WR-5 PPT (precipitation) | 11/07/2005 | 11:00 | 38.36575 | 114.31935 | 8,000 | -12.26 | -79.5 |
| WC-1 | 64737A | Headwaters Spring WR-5 PPT (precipitation) | 05/23/2006 | 13:20 | 38.36575 | 114.31935 | 8,000 | -13.86 | -97.8 |
| WC-1 | 63565B | Headwaters Spring WR-5 Snowsotopoter | 11/07/2005 | 11:15 | 38.36575 | 114.31935 | 8,000 | -8.45 | -55.9 |
| WC-1 | 64737B | Headwaters Spring WR-5 Snowsotopoter | 05/23/2006 | 13:20 | 38.36575 | 114.31935 | 8,000 | -10.44 | -77.7 |

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**APPENDIX C. Physical, Water Chemistry, and Isotopic Data for Springs in Discharge Areas of the White River and Meadow Valley Wash Regional Groundwater Flow Systems and Spring and Snake Valleys**

Table C-1. Location and field parameters for springs in discharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter).

| Site | Ref. Site | DRI Lab # | Site Name | Sample Date | Sample Time | Latitude | Longitude | Altitude (ft) | Flow (gpm) | Water Temp (˚C) | pH (field) | EC (field) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Meadow Valley Wash | | | | | | | | | | | | |
| MW-1 | 144 | 61619 | Panaca Spring | 10/20/2004 | 13:40 | 37.80715 | 114.38116 | 4,830 | -- | 28.4 | 7.8 | 407 |
| MW-1 | 144 | 61969 | Panaca Spring | 01/24/2005 | 8:31 | 37.80715 | 114.38116 | 4,830 | -- | 28.6 | 7.7 | 412 |
| MW-1 | 144 | 62626 | Panaca Spring | 05/20/2005 | 6:50 | 37.80715 | 114.38116 | 4,830 | | 28.3 | 7.0 | 408 |
| MW-1 | 144 | 63231 | Panaca Spring | 08/16/2005 | 14:40 | 37.80715 | 114.38116 | 4,830 | -- | 28.9 | 7.04 | 416 |
| MW-1 | 144 | 63571 | Panaca Spring | 11/09/2005 | 7:22 | 37.80715 | 114.38116 | 4,830 | -- | 28.7 | 7.6 | 408 |
| MW-1 | 144 | 64169 | Panaca Spring | 02/17/2006 | 9:00 | 37.80715 | 114.38116 | 4,830 | -- | 28.8 | 7.71 | 404 |
| MW-2 | 129 | 61621 | Caliente Hot Springs Hotel | 10/20/2004 | 9:05 | 37.62159 | 114.51110 | 4,428 | -- | 40.7 | 8.2 | 465 |
| MW-2 | 129 | 61970 | Caliente Hot Springs Hotel | 01/24/2005 | 9:41 | 37.62159 | 114.51110 | 4,428 | -- | 40.4 | 8.1 | 492 |
| MW-2 | 129 | 62620 | Caliente Hot Springs Hotel | 05/19/2005 | 19:02 | 37.62159 | 114.51110 | 4,428 | -- | 41.0 | 7.5 | 499 |
| MW-2 | 129 | 63230 | Caliente Hot Springs Hotel | 08/16/2005 | 13:30 | 37.62159 | 114.51110 | 4,428 | -- | 40.1 | 7.62 | 500 |
| MW-2 | 129 | 63572 | Caliente Hot Springs Hotel | 11/09/2005 | 8:23 | 37.62159 | 114.51110 | 4,428 | -- | 41.5 | 7.71 | 485 |
| MW-2 | 129 | 64170 | Caliente Hot Springs Hotel | 02/17/2006 | 10:16 | 37.62159 | 114.51110 | 4,428 | -- | 39.7 | 7.91 | 489 |
| Moapa Valley | | | | | | | | | | | | |
| MV-1 | 67 | 58488 | Pederson's Warm Spring (M-13) | 01/12/2004 | 11:45 | 36.70958 | 114.71594 | 1,820 | -- | 31.6 | 7.3 | 961 |
| MV-1 | 67 | 60306 | Pederson's Warm Spring (M-13) | 05/18/2004 | 9:30 | 36.70958 | 114.71594 | 1,820 | -- | 31.1 | 7.4 | 955 |
| MV-1 | 67 | 61617 | Pederson's Warm Spring (M-13) | 10/19/2004 | 10:20 | 36.70958 | 114.71594 | 1,820 | -- | -- | -- | -- |
| MV-1 | 67 | 62031 | Pederson's Warm Spring (M-13) | 02/10/2005 | 9:38 | 36.70958 | 114.71594 | 1,820 | -- | 31.2 | 7.3 | 954 |
| MV-1 | 67 | 62723 | Pederson's Warm Spring (M-13) | 06/08/2005 | -- | 36.70958 | 114.71594 | 1,820 | -- | -- | -- | -- |
| MV-1 | 67 | 64172 | Pederson's Warm Spring (M-13) | 02/16/2006 | 8:43 | 36.70958 | 114.71594 | 1,820 | -- | 31.3 | 7.34 | 933 |
| MV-2 | 290 | 58497 | Pederson's East | 01/12/2004 | 12:00 | 36.70933 | 114.71556 | 1,800 | -- | 32.0 | 7.3 | 945 |
| MV-2 | 290 | 60307 | Pederson's East | 05/18/2004 | 10:15 | 36.70933 | 114.71556 | 1,800 | -- | 31.9 | 7.4 | 936 |
| MV-2 | 290 | 61613 | Pederson's East | 10/19/2004 | 10:40 | 36.70933 | 114.71556 | 1,800 | -- | -- | -- | -- |
| MV-2 | 290 | 62032 | Pederson's East | 02/10/2005 | -- | 36.70933 | 114.71556 | 1,800 | -- | 31.2 | 7.4 | 937 |
| MV-2 | 290 | 62722 | Pederson's East | 06/08/2005 | -- | 36.70933 | 114.71556 | 1,800 | -- | -- | -- | -- |
| MV-2 | 290 | 64173 | Pederson’s East | 02/16/2006 | 9:15 | 36.70933 | 114.71556 | 1,800 | -- | 31.6 | 7.32 | 920 |
| MV-3 | 291 | 58496 | Baldwin Spring | 01/12/2004 | -- | 36.72035 | 114.72415 | 1,800 | 1,380 | 31.9 | 7.3 | 938 |
| MV-3 | 291 | 60309 | Baldwin Spring | 05/18/2004 | 13:00 | 36.72035 | 114.72415 | 1,800 | -- | 32.0 | 7.5 | 929 |
| MV-3 | 291 | 61620 | Baldwin Spring | 10/19/2004 | 10:03 | 36.72035 | 114.72415 | 1,800 | -- | -- | -- | -- |
| MV-3 | 291 | 62034 | Baldwin Spring | 02/10/2005 | 11:15 | 36.72035 | 114.72415 | 1,800 | -- | 31.8 | 7.3 | 931 |
| MV-3 | 291 | 62725 | Baldwin Spring | 06/08/2005 | -- | 36.72035 | 114.72415 | 1,800 | -- | -- | -- | -- |
| MV-3 | 291 | 64174 | Baldwin Spring | 02/16/2006 | 10:47 | 36.72035 | 114.72415 | 1,800 | -- | 31.8 | 7.32 | 913 |
| MV-4 | 69 | 60308 | Muddy Spring at LDS Farm | 05/18/2004 | 10:40 | 36.72191 | 114.71682 | 1,758 | 3,777 | 31.0 | -- | -- |
| MV-4 | 69 | 61615 | Muddy Spring at LDS Farm | 10/19/2004 | -- | 36.72191 | 114.71682 | 1,758 | -- | -- | -- | -- |

Table C-1. Location and field parameters for springs in discharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter) (continued).

| Site | Ref. Site | DRI Lab # | Site Name | Sample Date | Sample Time | Latitude | Longitude | Altitude (ft) | Flow (gpm) | Water Temp (˚C) | pH (field) | EC (field) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MV-5 | 292 | 61616 | Jones Spring Pumphouse | 10/19/2004 | 9:50 | 36.71116 | 114.71694 | 2,110 | -- | -- | -- | -- |
| MV-5 | 293 | 62033 | Jones Spring Pumphouse | 02/10/2005 | 10:30 | 36.71116 | 114.71694 | 2,110 | -- | 27.2 | 7.4 | 934 |
| MV-5 | 293 | 62724 | Jones Spring Pumphouse | 06/08/2005 | -- | 36.71116 | 114.71694 | 2,110 | -- | -- | -- | -- |
| MV-5 | 292 | 64175 | Jones Spring Pumphouse | 02/16/2006 | 10:19 | 36.71116 | 114.71694 | 2,110 | -- | 31.7 | 7.36 | 917 |
| Pahranagat Valley | | | | | | | | | | | | |
| PV-2 | 116 | 61106 | Crystal Springs | 07/30/2004 | 10:30 | 37.53181 | 115.23383 | 3,806 | -- | 27.3 | 7.3 | 480 |
| PV-2 | 116 | 61618 | Crystal Springs | 10/20/2004 | 11:40 | 37.53181 | 115.23383 | 3,806 | -- | 27.3 | 7.6 | 476 |
| PV-2 | 116 | 61971 | Crystal Springs | 01/24/2005 | 12:40 | 37.53181 | 115.23383 | 3,806 | -- | 27.2 | 7.5 | 482 |
| PV-2 | 116 | 62622 | Crystal Springs | 05/18/2005 | 18:14 | 37.53181 | 115.23383 | 3,806 | -- | 27.1 | 7.3 | 478 |
| PV-2 | 116 | 63229 | Crystal Springs | 08/14/2005 | 17:45 | 37.53181 | 115.23383 | 3,806 | -- | 27.0 | 6.92 | 481 |
| PV-2 | 116 | 63574 | Crystal Spring | 11/09/2005 | 15:06 | 37.53163 | 115.23383 | 3,806 | -- | 27.1 | 7.38 | 472 |
| PV-2 | 116 | 64168 | Crystal Springs | 02/17/2006 | 12:00 | 37.53181 | 115.23383 | 3,806 | -- | 27.1 | 7.44 | 498 |
| Snake Valley | | | | | | | | | | | | |
| SU-1 | 333 | 61482 | Gandy Warm Spring | 09/24/2004 | 11:27 | 39.45998 | 114.03708 | 5,248 | -- | 27.0 | 7.23 | 492 |
| SU-1 | 333 | 61963 | Gandy Warm Spring | 01/22/2005 | 10:36 | 39.45998 | 114.03708 | 5,248 | -- | 26.9 | 7.71 | 498 |
| SU-1 | 333 | 62623 | Gandy Warm Spring | 05/23/2005 | 13:00 | 39.45998 | 114.03708 | 5,248 | -- | 26.9 | 7.12 | 488 |
| SU-1 | 333 | 63224 | Gandy Warm Spring | 08/12/2005 | -- | 39.45998 | 114.03708 | 5,248 | -- | 26.9 | 7.07 | 495 |
| SU-1 | 333 | 63568 | Gandy Warm Spring | 11/08/2005 | 11:15 | 39.45998 | 114.03708 | 5,248 | -- | 26.6 | 7.52 | 486 |
| SU-1 | 333 | 64237 | Gandy Warm Springs | 02/25/2006 | 14:45 | 39.45998 | 114.03708 | 5,248 | -- | 26.8 | 7.58 | 486 |
| SU-2 | 325 | 61964 | Big Spring | 01/22/2005 | 13:30 | 38.69882 | 114.13223 | 5,579 | -- | 17.2 | 7.5 | 387 |
| SU-2 | 325 | 62617 | Big Spring | 05/20/2005 | 16:12 | 38.69892 | 114.13223 | 5,579 | -- | 17.0 | 6.9 | 398 |
| SU-2 | 325 | 63226 | Big Spring | 08/13/2005 | 15:20 | 38.69892 | 114.13223 | 5,579 | -- | 17.7 | 7.13 | 385 |
| SU-2 | 325 | 63569 | Big Spring | 11/08/2005 | 13:36 | 38.69892 | 114.13223 | 5,579 | -- | 17.2 | 7.5 | 389 |
| SU-2 | 325 | 64238 | Big Spring | 02/25/2006 | 16:54 | 38.69892 | 114.13223 | 5,579 | -- | 16.8 | 7.61 | 393 |
| Spring Valley | | | | | | | | | | | | |
| SV-1 | 329 | 61965 | The Cedars | 01/22/2005 | 16:23 | 38.93533 | 114.41796 | 5,779 | -- | 18.7 | 8.0 | 134 |
| SV-1 | 329 | 62621 | The Cedars | 05/20/2005 | 18:00 | 38.93533 | 114.41796 | 5,779 | -- | 18.9 | 8.0 | 131 |
| SV-1 | 329 | 63225 | The Cedars | 08/12/2005 | 16:50 | 38.93533 | 114.41796 | 5,779 | -- | 18.8 | 7.19 | 133 |
| SV-1 | 329 | 63570 | The Cedars | 11/08/2005 | 15:47 | 38.93533 | 114.41796 | 5,779 | -- | 18.3 | 7.95 | 131 |
| SV-1 | 329 | 64240 | The Cedars | 02/26/2006 | 12:24 | 38.93533 | 114.41796 | 5,779 | -- | 18.2 | 8.1 | 132 |
| White River Valley | | | | | | | | | | | | |
| WV-1 | 231 | 61483 | Preston Big Spring | 09/25/2004 | 8:36 | 38.93466 | 115.08164 | 5,729 | -- | 21.2 | 7.3 | 404 |
| WV-1 | 231 | 61968 | Preston Big Spring | 01/24/2005 | -- | 38.93466 | 115.08164 | 5,729 | -- | 20.8 | 7.6 | 407 |
| WV-1 | 231 | 62627 | Preston Big Spring | 05/21/2005 | 13:43 | 38.93466 | 115.08164 | 5,729 | -- | 21.1 | 7.5 | 400 |
| WV-1 | 231 | 63227 | Preston Big Spring | 08/14/2005 | 13:15 | 38.93466 | 115.08464 | 5,729 | -- | 21.1 | 7.04 | 406 |

Table C-1. Location and field parameters for springs in discharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter) (continued).

| Site | Ref. Site | DRI Lab # | Site Name | Sample Date | Sample Time | Latitude | Longitude | Altitude (ft) | Flow (gpm) | Water Temp (˚C) | pH (field) | EC (field) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WV-1 | 231 | 63563 | Preston Big Spring | 11/06/2005 | 12:36 | 38.93466 | 115.08464 | 5,729 | -- | 20.9 | 7.77 | 399 |
| WV-2 | 197 | 61484 | Hot Creek Springs | 09/25/2004 | 11:44 | 38.38251 | 115.15451 | 5,234 | -- | 31.8 | 7.2 | 540 |
| WV-2 | 197 | 61972 | Hot Creek Springs | 01/24/2005 | 14:04 | 38.38251 | 115.15451 | 5,234 | -- | 31.3 | 7.3 | 545 |
| WV-2 | 197 | 62624 | Hot Creek Springs | 05/18/2005 | 16:19 | 38.38251 | 115.15451 | 5,234 | -- | 31.2 | 7.1 | 542 |
| WV-2 | 197 | 63228 | Hot Creek Springs | 08/14/2005 | 16:00 | 38.38251 | 115.15451 | 5,234 | -- | 31.3 | 6.77 | 545 |
| WV-2 | 197 | 63564 | Hot Creek Springs | 11/06/2005 | 14:25 | 38.38251 | 115.15451 | 5,234 | -- | 30.9 | 7.33 | 535 |
| WV-2 | 197 | 64234 | Hot Creek Springs | 02/17/2006 | 14:28 | 38.38251 | 115.15451 | 5,234 | -- | 31.3 | 7.29 | 532 |

Table C-2. Major ions and dissolved oxygen values for springs in discharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter).

| Site | Site Name | Sample Date | DO (mgl) | Ca (mg/l) | Mg (mg/l) | Na (mg/l) | K (mg/l) | Cl (mg/l) | $SO_4$ (mg/l) | $HCO_3$-lab (mg/l) | $CO_3$-lab (mg/l) | $SiO_2$ (mg/l) | F (mg/l) | Br (mg/k) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Meadow Valley Wash | | | | | | | | | | | | | | |
| MW-1 | Panaca Spring | 10/20/2004 | 4.0 | 32.4 | 10.4 | 38.0 | 7.43 | 17.8 | 30 | 176 | 0.0 | 52.4 | 1.41 | 0.10 |
| MW-1 | Panaca Spring | 01/24/2005 | 5.4 | 32.6 | 10.3 | 37.9 | 7.19 | 17.3 | 29.3 | 177 | 0.0 | 49.7 | 1.42 | 0.10 |
| MW-1 | Panaca Spring | 05/20/2005 | 4.7 | 32.8 | 10.0 | 37.0 | 6.9 | 17.2 | 29.7 | 179 | 0.0 | 52.4 | 1.54 | 0.10 |
| MW-1 | Panaca Spring | 08/16/2005 | 4.42 | 33.1 | 9.9 | 37.4 | 7.1 | 17.8 | 29.3 | 183 | 0.0 | 49.0 | 1.40 | 0.11 |
| MW-1 | Panaca Spring | 11/09/2005 | 4.6 | 30.0 | 10.3 | 37.6 | 7.00 | 17.4 | 29.1 | 179 | 0.0 | 49.0 | 1.42 | 0.11 |
| MW-1 | Panaca Spring | 02/17/2006 | 4.15 | 34.2 | 10.2 | 37.9 | 6.97 | 17.9 | 29.7 | 178 | 0.0 | 48.8 | 1.50 | 0.11 |
| MW-2 | Caliente Hot Springs Hotel | 10/20/2004 | 4.4 | 35.0 | 7.34 | 50.1 | 18.7 | 14.5 | 37 | 213 | 0.0 | 128 | 1.42 | 0.07 |
| MW-2 | Caliente Hot Springs Hotel | 01/24/2005 | 4.1 | 35.6 | 7.17 | 51.8 | 19.0 | 14.5 | 44.8 | 208 | 0.0 | 119 | 1.33 | 0.09 |
| MW-2 | Caliente Hot Springs Hotel | 05/19/2005 | 4.0 | 36.9 | 7.5 | 53.2 | 19.0 | 15.0 | 41 | 220 | 0.0 | 125 | 1.4 | 0.10 |
| MW-2 | Caliente Hot Springs Hotel | 08/16/2005 | 2.82 | 35.6 | 7.2 | 51.9 | 18.9 | 13.9 | 39.2 | 226 | 0.0 | 118 | 1.46 | 0.09 |
| MW-2 | Caliente Hot Springs Hotel | 11/09/2005 | 3.12 | 35.0 | 7.36 | 51.2 | 18.8 | 13.7 | 39.1 | 214 | 0.0 | 122 | 1.47 | 0.09 |
| MW-2 | Caliente Hot Springs Hotel | 02/17/2006 | 4.5 | 38.4 | 7.61 | 52.2 | 18.9 | 17.3 | 43.6 | 215 | 0.0 | 119 | 1.44 | 0.11 |
| Moapa Valley | | | | | | | | | | | | | | |
| MV-1 | Pederson's Warm Spring (M-13) | 01/12/2004 | 2.2 | 65.3 | 28.4 | 99.2 | 11.4 | 67.7 | 189 | 261 | 0.0 | 28.4 | -- | -- |
| MV-1 | Pederson's Warm Spring (M-13) | 05/18/2004 | 3.8 | 65.4 | 27.8 | 97.2 | 10.9 | 65.9 | 184 | 265 | 0.0 | 29.2 | -- | -- |
| MV-1 | Pederson's Warm Spring (M-13) | 10/19/2004 | 3.0 | 64.5 | 27.8 | 97.2 | 11.0 | 63.0 | 183 | 257 | 0.0 | 30.6 | 1.98 | 0.17 |
| MV-1 | Pederson's Warm Spring (M-13) | 02/10/2005 | 3.0 | 64.8 | 27.4 | 98.8 | 10.9 | 63.2 | 186 | 256 | 0.0 | 29.8 | 2.13 | 0.17 |
| MV-1 | Pederson's Warm Spring (M-13) | 06/08/2005 | 2.4 | 65.0 | 27.7 | 98.9 | 10.9 | 63.0 | 183 | 256 | 0.0 | 30.6 | 2.21 | 0.17 |
| MV-1 | Pederson's Warm Spring (M-13) | 02/16/2006 | 2.65 | 66.6 | 27.7 | 99.2 | 10.6 | 62.4 | 185 | 255 | 0.0 | 29.4 | 2.20 | 0.18 |
| MV-2 | Pederson's East | 01/12/2004 | 2.4 | 64.3 | 28.5 | 96.4 | 11.6 | 66.1 | 178 | 255 | 0.0 | 30.3 | -- | -- |
| MV-2 | Pederson's East | 05/18/2004 | 2.7 | 64.6 | 27.6 | 94.2 | 11.1 | 61.4 | 181 | 264 | 0.0 | 29.1 | -- | -- |
| MV-2 | Pederson's East | 10/19/2004 | 2.3 | 68.2 | 28.3 | 94.0 | 11.3 | 61.5 | 178 | 257 | 0.0 | 31.2 | 1.89 | 0.17 |
| MV-2 | Pederson's East | 02/10/2005 | 3.2 | 64.4 | 27.7 | 95.6 | 11.2 | 62.0 | 181 | 253 | 0.0 | 29.5 | 1.96 | 0.17 |
| MV-2 | Pederson's East | 06/08/2005 | 3.02 | 64.1 | 27.4 | 94.9 | 11.0 | 61.0 | 177 | 240 | 0.0 | 31.0 | 2.03 | 0.16 |
| MV-2 | Pederson's East | 02/16/2006 | 2.7 | 64.8 | 27.7 | 95.7 | 10.1 | 61.0 | 180 | 254 | 0.0 | 29.1 | 2.19 | 0.18 |
| MV-3 | Baldwin Spring | 01/12/2004 | 2.6 | 63.8 | 28.1 | 96.3 | 11.6 | 63.8 | 180 | 260 | 0.0 | 32.0 | -- | -- |
| MV-3 | Baldwin Spring | 05/18/2004 | 3.0 | 63.7 | 27.6 | 94.7 | 11.1 | 64.1 | 180 | 263 | 0.0 | 29.2 | -- | -- |
| MV-3 | Baldwin Spring | 10/19/2004 | 2.35 | 62.8 | 27.4 | 95.0 | 11.2 | 61.4 | 174 | 258 | 0.0 | 32.1 | 2.09 | 0.16 |
| MV-3 | Baldwin Spring | 02/10/2005 | 2.7 | 63.1 | 27.4 | 95.7 | 11.2 | 61.7 | 178 | 252 | 0.0 | 29.6 | 2.13 | 0.17 |
| MV-3 | Baldwin Spring | 06/08/2005 | 2.83 | 63.4 | 27.5 | 95.3 | 11.3 | 61.3 | 173 | 243 | 0.0 | 32.0 | 2.20 | 0.16 |
| MV-3 | Baldwin Spring | 02/16/2006 | 2.64 | 63.5 | 27.2 | 96.8 | 10.9 | 61.1 | 176 | 253 | 0.0 | 29.6 | 2.21 | 0.18 |
| MV-4 | Muddy Spring at LDS Farm | 05/18/2004 | -- | 64.4 | 27.6 | 99.9 | 10.9 | 64.2 | 198 | 270 | 0.0 | 29.9 | -- | -- |
| MV-4 | Muddy Spring at LDS Farm | 10/19/2004 | -- | 63.4 | 27.0 | 99.1 | 10.9 | 64.5 | 178 | 255 | 0.0 | 32.6 | 2.12 | 0.16 |
| MV-5 | Jones Spring Pumphouse | 10/19/2004 | 3.77 | 62.9 | 27.2 | 95.0 | 11.2 | 62.1 | 176 | 257 | 0.0 | 31.6 | 1.96 | 0.17 |
| MV-5 | Jones Spring Pumphouse | 02/10/2005 | 5.3 | 63.4 | 27.4 | 95.7 | 11.1 | 63.1 | 178 | 252 | 0.0 | 29.5 | 1.94 | 0.18 |
| MV-5 | Jones Spring Pumphouse | 06/08/2005 | 3.9 | 63.7 | 27.3 | 96.0 | 11.2 | 61.9 | 174 | 256 | 0.0 | 31.4 | 2.18 | 0.17 |
| MV-5 | Jones Spring Pumphouse | 02/16/2006 | 3.67 | 63.8 | 27.4 | 96.3 | 10.9 | 61.8 | 178 | 254 | 0.0 | 29.4 | 2.20 | 0.18 |

Table C-2. Major ions and dissolved oxygen values for springs in discharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter) (continued).

| Site | Site Name | Sample Date | DO (mgl) | Ca (mg/l) | Mg (mg/l) | Na (mg/l) | K (mg/l) | Cl (mg/l) | $SO_4$ (mg/l) | $HCO_3$-lab (mg/l) | $CO_3$-lab (mg/l) | $SiO_2$ (mg/l) | F (mg/l) | Br (mg/k) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pahranagat Valley | | | | | | | | | | | | | | |
| PV-2 | Crystal Springs | 07/30/2004 | 5.1 | 43.1 | 22.2 | 23.6 | 5.26 | 8.7 | 32.3 | 255 | 0.0 | 26.4 | 0.30 | 0.08 |
| PV-2 | Crystal Springs | 10/20/2004 | 1.3 | 45.3 | 22.4 | 24.2 | 5.28 | 9.1 | 34 | 240 | 0.0 | 26.6 | 0.33 | 0.07 |
| PV-2 | Crystal Springs | 01/24/2005 | 1.3 | 45.6 | 22.0 | 24.1 | 5.18 | 8.8 | 33.2 | 247 | 0.0 | 25.2 | 0.31 | 0.08 |
| PV-2 | Crystal Springs | 05/18/2005 | 1.3 | 45.4 | 22.1 | 23.8 | 5.1 | 9.1 | 33.5 | 247 | 0.0 | 26.5 | 0.35 | 0.08 |
| PV-2 | Crystal Springs | 08/14/2005 | 1.26 | 46.0 | 21.7 | 23.6 | 5.1 | 9.0 | 33.4 | 262 | 0.0 | 24.7 | 0.31 | 0.08 |
| PV-2 | Crystal Spring | 11/09/2005 | 1.28 | 45.7 | 22.2 | 23.8 | 5.10 | 9.3 | 33.1 | 248 | 0.0 | 25 | 0.33 | 0.07 |
| PV-2 | Crystal Springs | 02/17/2006 | 1.26 | 46.3 | 22.5 | 24.2 | 5.35 | 9.5 | 33.8 | 247 | 0.0 | 24.7 | 0.35 | 0.08 |
| Snake Valley | | | | | | | | | | | | | | |
| SU-1 | Gandy Warm Spring | 09/24/2004 | 492 | 49.8 | 16.8 | 29.3 | 3.9 | 23.9 | 22.1 | 245 | 0.0 | 23.1 | 0.58 | 0.08 |
| SU-1 | Gandy Warm Spring | 01/22/2005 | 6.3 | 50.7 | 17.1 | 29.1 | 3.92 | 23.6 | 22.6 | 236 | 0.0 | 22.8 | 0.62 | 0.08 |
| SU-1 | Gandy Warm Spring | 05/23/2005 | 5.84 | 50.9 | 16.8 | 28.6 | 3.8 | 23.7 | 22.6 | 223 | 0.0 | 24.2 | 0.64 | 0.09 |
| SU-1 | Gandy Warm Spring | 08/12/2005 | 5.77 | 49.9 | 16.4 | 28.4 | 3.9 | 23.6 | 22.2 | 240 | 0.0 | 22.3 | 0.57 | 0.08 |
| SU-1 | Gandy Warm Spring | 11/08/2005 | 4.9 | 47.3 | 17.0 | 28.5 | 3.91 | 22.8 | 22.5 | 235 | 0.0 | 22.7 | 0.6 | 0.08 |
| SU-1 | Gandy Warm Springs | 02/25/2006 | 5.5 | 50.8 | 16.2 | 28.2 | 3.89 | 23.7 | 22.8 | 236 | 0.0 | 22.5 | 0.65 | 0.09 |
| SU-2 | Big Spring | 01/22/2005 | 5.3 | 47.8 | 20.3 | 5.50 | 1.51 | 5.1 | 8.5 | 228 | 0.0 | 12.6 | 0.13 | 0.03 |
| SU-2 | Big Spring | 05/20/2005 | 5.5 | 47.3 | 19.9 | 5.4 | 1.5 | 5.7 | 8.3 | 228 | 0.0 | 13.5 | 0.13 | 0.04 |
| SU-2 | Big Spring | 08/13/2005 | 5.05 | 48.3 | 19.5 | 5.3 | 1.5 | 5.5 | 8.5 | 234 | 0.0 | 12.7 | 0.13 | 0.02 |
| SU-2 | Big Spring | 11/08/2005 | 4.88 | 42.9 | 20.2 | 5.34 | 1.51 | 5.8 | 8.5 | 229 | 0.0 | 12.7 | 0.13 | 0.03 |
| SU-2 | Big Spring | 02/25/2006 | 5.16 | 47.5 | 19.6 | 5.32 | 1.50 | 5.5 | 8.6 | 229 | 0.0 | 12.5 | 0.13 | 0.03 |
| Spring Valley | | | | | | | | | | | | | | |
| SV-1 | The Cedars | 01/22/2005 | 8.0 | 20.0 | 1.70 | 5.88 | 0.85 | 2.0 | 3.2 | 75 | 0.0 | 20.7 | 0.19 | <.02 |
| SV-1 | The Cedars | 05/20/2005 | 8.4 | 19.6 | 1.7 | 5.7 | 0.8 | 2.1 | 3.3 | 73 | 0.0 | 22.5 | 0.20 | 0.02 |
| SV-1 | The Cedars | 08/12/2005 | -- | 19.8 | 1.7 | 5.9 | 0.9 | 2.0 | 3.3 | 74 | 0.0 | 20.6 | 0.18 | 0.08 |
| SV-1 | The Cedars | 11/08/2005 | 7.3 | 20.1 | 1.69 | 5.71 | 0.82 | 2.0 | 3.3 | 73 | 0.0 | 20.7 | 0.19 | 0.03 |
| SV-1 | The Cedars | 02/26/2006 | 7.72 | 20.1 | 1.59 | 5.60 | 0.84 | 2.1 | 3.4 | 75 | 0.0 | 20.5 | 0.19 | <.02 |
| White River Valley | | | | | | | | | | | | | | |
| WV-1 | Preston Big Spring | 09/25/2004 | 2.6 | 40.7 | 19.4 | 13.6 | 3.1 | 15.9 | 37.7 | 182 | 0.0 | 19.9 | 0.35 | 0.11 |
| WV-1 | Preston Big Spring | 01/24/2005 | 3.1 | 41.9 | 19.8 | 13.0 | 3.23 | 16.0 | 38.1 | 176 | 0.0 | 19.9 | 0.34 | 0.11 |
| WV-1 | Preston Big Spring | 05/21/2005 | 3.1 | 41.8 | 19.2 | 12.8 | 3.2 | 15.8 | 38.3 | 176 | 0.0 | 21.3 | 0.36 | <.02 |
| WV-1 | Preston Big Spring | 08/14/2005 | 2.98 | 42.4 | 19.2 | 12.9 | 3.2 | 15.8 | 38.2 | 182 | 0.0 | 19.8 | 0.33 | 0.11 |
| WV-1 | Preston Big Spring | 11/06/2005 | 2.6 | 41.9 | 19.6 | 12.6 | 3.08 | 15.8 | 38.1 | 174 | 0.0 | 20.0 | 0.34 | 0.10 |
| WV-2 | Hot Creek Springs | 09/25/2004 | 1.3 | 57.9 | 22.1 | 24.9 | 4.82 | 10.1 | 43.9 | 282 | 0.0 | 28.2 | 0.94 | 0.07 |
| WV-2 | Hot Creek Springs | 01/24/2005 | 1.4 | 59.0 | 22.2 | 25.0 | 5.28 | 10.0 | 45.5 | 272 | 0.0 | 27.8 | 0.97 | 0.07 |
| WV-2 | Hot Creek Springs | 05/18/2005 | 1.6 | 58.9 | 21.9 | 24.7 | 5.2 | 10.4 | 44.9 | 268 | 0.0 | 29.4 | 1.02 | 0.07 |
| WV-2 | Hot Creek Springs | 08/14/2005 | 1.60 | 59.0 | 21.4 | 24.6 | 5.2 | 10.1 | 44.7 | 281 | 0.0 | 27.5 | 0.95 | 0.08 |
| WV-2 | Hot Creek Springs | 11/06/2005 | 1.52 | 59.7 | 22.4 | 24.3 | 5.03 | 10.0 | 45.1 | 273 | 0.0 | 27.7 | 1.02 | 0.07 |
| WV-2 | Hot Creek Springs | 02/17/2006 | 1.06 | 59.5 | 21.5 | 24.3 | 5.14 | 10.1 | 45.2 | 271 | 0.0 | 28.8 | 1.04 | 0.07 |

Table C-3. Stable isotopes for springs in discharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter).

| Site | Site Name | Sample Date | $\delta^{18}O$ (‰) | $\delta D$ (‰) |
|---|---|---|---|---|
| Meadow Valley Wash | | | | |
| MW-1 | Panaca Spring | 10/20/2004 | -14.11 | -107.4 |
| MW-1 | Panaca Spring | 01/24/2005 | -14.25 | -107.9 |
| MW-1 | Panaca Spring | 05/20/2005 | -14.15 | -107.1 |
| MW-1 | Panaca Spring | 08/16/2005 | -14.17 | -106.4 |
| MW-1 | Panaca Spring | 11/09/2005 | -14.18 | -106.8 |
| MW-1 | Panaca Spring | 02/17/2006 | -14.20 | -105.8 |
| MW-2 | Caliente Hot Springs Hotel | 10/20/2004 | -14.52 | -106.4 |
| MW-2 | Caliente Hot Springs Hotel | 01/24/2005 | -14.29 | -109.3 |
| MW-2 | Caliente Hot Springs Hotel | 05/19/2005 | -14.43 | -107.0 |
| MW-2 | Caliente Hot Springs Hotel | 08/16/2005 | -14.47 | -109.0 |
| MW-2 | Caliente Hot Springs Hotel | 11/09/2005 | -14.47 | -107.2 |
| MW-2 | Caliente Hot Springs Hotel | 02/17/2006 | -14.42 | -107.7 |
| Moapa Valley | | | | |
| MV-1 | Pederson's Warm Spring (M-13) | 01/12/2004 | -12.91 | -97.2 |
| MV-1 | Pederson's Warm Spring (M-13) | 05/18/2004 | -12.85 | -97.5 |
| MV-1 | Pederson's Warm Spring (M-13) | 10/19/2004 | -12.92 | -97.4 |
| MV-1 | Pederson's Warm Spring (M-13) | 02/10/2005 | -12.91 | -98.0 |
| MV-1 | Pederson's Warm Spring (M-13) | 06/08/2005 | -12.91 | -97.6 |
| MV-1 | Pederson's Warm Spring (M-13) | 02/16/2006 | -13.02 | -97.2 |
| MV-2 | Pederson's East | 01/12/2004 | -12.92 | -97.0 |
| MV-2 | Pederson's East | 05/18/2004 | -12.92 | -97.0 |
| MV-2 | Pederson's East | 10/19/2004 | -12.98 | -98.4 |
| MV-2 | Pederson's East | 02/10/2005 | -12.89 | -98.3 |
| MV-2 | Pederson's East | 06/08/2005 | -12.96 | -98.3 |
| MV-2 | Pederson’s East | 02/16/2006 | -13.00 | -97.5 |
| MV-3 | Baldwin Spring | 01/12/2004 | -12.95 | -96.3 |
| MV-3 | Baldwin Spring | 05/18/2004 | -12.93 | -96.8 |
| MV-3 | Baldwin Spring | 10/19/2004 | -12.96 | -98.6 |
| MV-3 | Baldwin Spring | 02/10/2005 | -12.94 | -98.1 |
| MV-3 | Baldwin Spring | 06/08/2005 | -12.94 | -97.2 |
| MV-3 | Baldwin Spring | 02/16/2006 | -13.05 | -98.0 |
| MV-4 | Muddy Spring at LDS Farm | 05/18/2004 | -12.84 | -98.4 |
| MV-4 | Muddy Spring at LDS Farm | 10/19/2004 | -12.89 | -97.6 |
| MV-5 | Jones Spring Pumphouse | 10/19/2004 | -12.94 | -98.2 |
| MV-6 | Jones Spring Pumphouse | 02/10/2005 | -12.99 | -98.9 |
| MV-6 | Jones Spring Pumphouse | 06/08/2005 | -12.99 | -97.8 |
| MV-6 | Jones Spring Pumphouse | 02/16/2006 | -13.07 | -97.7 |

Table C-3. Stable isotopes for springs in discharge areas of the White River and Meadow Valley Wash regional groundwater flow systems and Spring and Snake valleys (-- indicates samples not analyzed for this parameter) (continued).

| Site | Site Name | Sample Date | $\delta^{18}O$ (‰) | $\delta D$ (‰) |
|---|---|---|---|---|
| Pahranagat Valley | | | | |
| PV-2 | Crystal Springs | 07/30/2004 | -14.36 | -109.2 |
| PV-2 | Crystal Springs | 10/20/2004 | -14.41 | -109.0 |
| PV-2 | Crystal Springs | 01/24/2005 | -14.35 | -109.4 |
| PV-2 | Crystal Springs | 05/18/2005 | -14.44 | -107.3 |
| PV-2 | Crystal Springs | 08/14/2005 | -14.46 | -109.3 |
| PV-2 | Crystal Spring | 11/09/2005 | -14.42 | -110.1 |
| PV-2 | Crystal Springs | 02/17/2006 | -14.53 | -108.8 |
| Snake Valley | | | | |
| SU-1 | Gandy Warm Spring | 09/24/2004 | -15.83 | -119.6 |
| SU-1 | Gandy Warm Spring | 01/22/2005 | -15.88 | -120.0 |
| SU-1 | Gandy Warm Spring | 05/23/2005 | -15.83 | -119.4 |
| SU-1 | Gandy Warm Spring | 08/12/2005 | -15.93 | -119.8 |
| SU-1 | Gandy Warm Spring | 11/08/2005 | -15.90 | -122.8 |
| SU-1 | Gandy Warm Springs | 02/25/2006 | -15.96 | -119.5 |
| SU-2 | Big Spring | 01/22/2005 | -15.14 | -112.2 |
| SU-2 | Big Spring | 05/20/2005 | -15.15 | -109.8 |
| SU-2 | Big Spring | 08/13/2005 | -15.22 | -112.2 |
| SU-2 | Big Spring | 11/08/2005 | -15.10 | -110.3 |
| SU-2 | Big Spring | 02/25/2006 | -15.17 | -111.6 |
| Spring Valley | | | | |
| SV-1 | The Cedars | 01/22/2005 | -15.02 | -110.3 |
| SV-1 | The Cedars | 05/20/2005 | -15.03 | -108.1 |
| SV-1 | The Cedars | 08/12/2005 | -15.00 | -108.6 |
| SV-1 | The Cedars | 11/08/2005 | -15.00 | -108.2 |
| SV-1 | The Cedars | 02/26/2006 | -15.02 | -108.4 |
| White River Valley | | | | |
| WV-1 | Preston Big Spring | 09/25/2004 | -15.87 | -122.6 |
| WV-1 | Preston Big Spring | 01/24/2005 | -15.89 | -122.4 |
| WV-1 | Preston Big Spring | 05/21/2005 | -15.86 | -120.0 |
| WV-1 | Preston Big Spring | 08/14/2005 | -15.88 | -121.2 |
| WV-1 | Preston Big Spring | 11/06/2005 | -15.86 | -120.4 |
| WV-2 | Hot Creek Springs | 09/25/2004 | -15.71 | -120.5 |
| WV-2 | Hot Creek Springs | 01/24/2005 | -15.66 | -119.0 |
| WV-2 | Hot Creek Springs | 05/18/2005 | -15.66 | -118.6 |
| WV-2 | Hot Creek Springs | 08/14/2005 | -15.70 | -117.4 |
| WV-2 | Hot Creek Springs | 11/06/2005 | -15.73 | -119.1 |
| WV-2 | Hot Creek Springs | 02/17/2006 | -15.75 | -118.4 |

**APPENDIX D. The Number and Identity of Aquatic Macroinvertebrates Collected from Springs in the White River System, 2003, 2004, and 2005. The data series for each sample is distinguished by a different color of the sample headings.**

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005. Values shown are the number of individuals collected for each taxon out of a sample of approximately 300 individuals, following standard bioassessment protocols in the DRI Aquatic Ecology Laboratory. Sample size ranged from 205 to 591 in response to the paucity of individuals in the sample or to compositing samples during a single sample time. ND = nondistinct taxa.

| **Sample #** | DWS03-042 | DWS03-043 | DRI-050&051 | DRI05-061 | DRI05-281 | DWS03-049 |
|---|---|---|---|---|---|---|
| **Date Sampled** | 10/12/2003 | 10/12/2003 | 07/27/2004 | 07/21/2005 | 11/06/2005 | 10/13/2003 |
| **Spring Name** | Deer Sp. | White River Source | White River Source | White River Source | White River Source | Unnamed Sp. |
| **Sample Type** | Composite | Composite | Composite | Composite | Composite | Composite |
| **Location** | T13N-R58E-NE13 | T13N-R58E-NE35 | T13N-R58E-NE35 | T13N-R58E-NE35 | T13N-R58E-NE35 | T15N-R63E-NE7 |
| **Mountain Range** | White Pine | White Pine | White Pine | White Pine | White Pine | Egan |
| **Phylum Arthropoda** | | | | | | |
| **Class Insecta** | | | | | | |
| **Order Ephemeroptera** | | | | | | |
| **Ameletidae** | | | | | | |
| *Ameletus* | | 14 | 2 | 2 | 1 | |
| **Baetidae** | | | | | | |
| *Baetis* | 6 | 106 | 46 | | | 38 |
| *Diphetor hageni* | | | | | 2 | |
| *Fallceon quilleri* | | | 1 | | | |
| *Magnus* | | | | | | |
| *Baetis (tricaudatus)* | | | | | 2 | |
| *Baetis (bicaudatus)* | | | | | 21 | |
| **Heptageniidae** | | | 1 | | | |
| *Cinygmula* | | 6 | 8 | 5 | 4 | |
| **Leptophlebiidae** | | | | | | |
| **Plecoptera** | | | | | | |
| **Chloroperlidae** | | | | | | |
| *Sweltsa* | | 1 | | | | |
| **Nemouridae** | | | | | | |
| *Malenka* | | | 1 | 3 | | |
| *Zapada* | | | 2 | | 8 | |
| *Z. cinctipes* | 4 | 3 | | | | 4 |
| **Perlidae** | | | | | | |
| *Hesperoperla* | | 2 | 1 | | 1 | |
| **Perlodidae** | | | 6 | | | |
| *Isoperla* | | 2 | | | | |
| **Pteronarcyidae** | | | | | | |
| *Pteronarcella* | | 5 | 13 | 10 | 2 | |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DWS03-042 | DWS03-043 | DRI-050&051 | DRI05-061 | DRI05-281 | DWS03-049 |
|---|---|---|---|---|---|---|
| **Date Sampled** | 10/12/2003 | 10/12/2003 | 07/27/2004 | 07/21/2005 | 11/06/2005 | 10/13/2003 |
| **Spring Name** | Deer Sp. | White River Source | White River Source | White River Source | White River Source | Unnamed Sp. |
| **Sample Type** | Composite | Composite | Composite | Composite | Composite | Composite |
| **Location** | T13N-R58E-NE13 | T13N-R58E-NE35 | T13N-R58E-NE35 | T13N-R58E-NE35 | T13N-R58E-NE35 | T15N-R63E-NE7 |
| **Mountain Range** | White Pine | White Pine | White Pine | White Pine | White Pine | Egan |
| **Order Trichoptera** | | | | | | |
| | | | | | | |
| **Brachycentridae** | | | | | | |
| *Brachycentrus* | | | | | | |
| *Micrasema* | | | | | | |
| **Hydropsychidae** | | | | | | |
| *Ceratopsyche* | | | | | | |
| *Cheumatopsyche* | | | | | | |
| **Hydroptilidae** | | | | | | |
| *Ochrotrichia* | | | | | | |
| **Lepidostomatidae** | | | | | | |
| *Lepidostoma* | | | | | | |
| **Leptoceridae** | | | | | | |
| **Limnephillidae** | | | | | | |
| *Eocosmoecus* | | | | | | |
| *Hesperophylax* | 5 | 2 | | | | |
| *Limnephilus* | | | | | | 4 |
| **Odontoceridae** | | | | | | |
| *Marilia* | | | | | | |
| **Philopotamidae** | | | | | | |
| *Wormaldia* | | | | | | 2 |
| **Rhyacophilidae** | | | | | | |
| *Rhyacophila* | | | | | | |
| *R. acropedes gr (= brunnea-vemna)* | | | | | | |
| *R. vofixa Gr* | | | | | | 3 |
| **Coleoptera** | | | | | | |
| **Dytiscidae** | | | | | | |
| *Agabus* | | | | | | |
| *Oreodytes,* larva | | | | | | |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DWS03-042 | DWS03-043 | DRI-050&051 | DRI05-061 | DRI05-281 | DWS03-049 |
|---|---|---|---|---|---|---|
| **Date Sampled** | 10/12/2003 | 10/12/2003 | 07/27/2004 | 07/21/2005 | 11/06/2005 | 10/13/2003 |
| **Spring Name** | Deer Sp. | White River Source | White River Source | White River Source | White River Source | Unnamed Sp. |
| **Sample Type** | Composite | Composite | Composite | Composite | Composite | Composite |
| **Location** | T13N-R58E-NE13 | T13N-R58E-NE35 | T13N-R58E-NE35 | T13N-R58E-NE35 | T13N-R58E-NE35 | T15N-R63E-NE7 |
| **Mountain Range** | White Pine | White Pine | White Pine | White Pine | White Pine | Egan |
| **Elmidae** | | | | | | |
| *Cleptelmis* | | | | | | |
| *Heterlimnius* | | 2 | 8 | 4 | 2 | |
| **Microsporidae** | | | | | | |
| **Diptera** | | | | | | |
| **Ceratopogonidae** | | | | | | |
| *Atrichopogon* | | | | | | 2 |
| *Bezzia/ Palpomyia* | | | | | | |
| *Culicoides* | | | | | | |
| *Probezzia* | | | | | | |
| **Chironomidae** | | | | | | |
| Chironominae | | | | | | |
| Chironomini | | | | | | |
| *Apedilum* | | | | | | |
| *Paratendipes* | | | | | | |
| *Polypedilum* | | | | | | |
| *Polypedilum sf simulans-digitifer* | 2 | | | | | |
| *Tribelos* | | | | | | |
| Diamesinae | | | | | | |
| *Diamesa* | | | | 42 | | |
| *Pagastia* | | 2 | 12 | | | |
| *Pseudodiamesa* | | | 2 | 4 | | |
| Orthocladiinae | | | | | | |
| *Brillia* | | | | | | |
| *Corynoneura* | | 6 | 3 | | | |
| *Chaetocladius* | | | | 14 | | |
| *Cricotopus (cf Bicinctus Gr)* | | | | | | |
| *Cricotopus/Orthocladius* | | | 3 | 2 | 12 | |
| *Cricotopus/Orthocladius* | | | | | 18 | |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DWS03-042 | DWS03-043 | DRI-050&051 | DRI05-061 | DRI05-281 | DWS03-049 |
|---|---|---|---|---|---|---|
| **Date Sampled** | 10/12/2003 | 10/12/2003 | 07/27/2004 | 07/21/2005 | 11/06/2005 | 10/13/2003 |
| **Spring Name** | Deer Sp. | White River Source | White River Source | White River Source | White River Source | Unnamed Sp. |
| **Sample Type** | Composite | Composite | Composite | Composite | Composite | Composite |
| **Location** | T13N-R58E-NE13 | T13N-R58E-NE35 | T13N-R58E-NE35 | T13N-R58E-NE35 | T13N-R58E-NE35 | T15N-R63E-NE7 |
| **Mountain Range** | White Pine | White Pine | White Pine | White Pine | White Pine | Egan |
| *Eukieffriella* | | | 41 | | | |
| *Eukiefferiella (Brehmi Gr)* | | 44 | | | | |
| *Eukiefferiella (Claripennis Gr)* | | | | | | |
| *Eukiefferiella (Devonica Gr)* | | 12 | | | | |
| *Eukiefferiella (Gracei Gr)* | | | 90 | 5 | 51 | |
| *Eukiefferiella (Rectangularis Gr)* | | | | | | |
| *Limnophyes* | | | | | | |
| *Paramtriocnemus/Paraphaenocladius* | | | 17 | 1 | | |
| *Rheocricotopus* | | | | | | 1 |
| *Rheosmittia* | | | | | | |
| *Theinemanniella* | | 1 | 2 | | | |
| *Tvtenia* | | | 192 | | | |
| *Tvtenia (bavarica Gr)* | | | | | | |
| Podonominae | | | | | | |
| *Boreochlus* | | | 35 | | | |
| Tanypodinae | | | | | | |
| *Apsectrotanypus* | | 1 | | | | |
| *Nilotanypus* | | | | | | |
| *Paramerina* | | | | | | |
| *Radotanypus* | 15 | | | | | |
| *Thienemamannimyia* Gr | | | | | | |
| Tanytarsini | | | | | | |
| *Micropsectra* | | | 5 | | | |
| *Paratanytarsus* | | | | | | |
| *Tanytarsus* | 19 | | 2 | | | |
| *Rheotanytarsus* | | | | | | |
| **Culicidae** | | | | | | |
| *Anopheles* | | | | | | |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DWS03-042 | DWS03-043 | DRI-050&051 | DRI05-061 | DRI05-281 | DWS03-049 |
|---|---|---|---|---|---|---|
| **Date Sampled** | 10/12/2003 | 10/12/2003 | 07/27/2004 | 07/21/2005 | 11/06/2005 | 10/13/2003 |
| **Spring Name** | Deer Sp. | White River Source | White River Source | White River Source | White River Source | Unnamed Sp. |
| **Sample Type** | Composite | Composite | Composite | Composite | Composite | Composite |
| **Location** | T13N-R58E-NE13 | T13N-R58E-NE35 | T13N-R58E-NE35 | T13N-R58E-NE35 | T13N-R58E-NE35 | T15N-R63E-NE7 |
| **Mountain Range** | White Pine | White Pine | White Pine | White Pine | White Pine | Egan |
| **Torrenticolidae** | | | | | | |
| *Torrenticola* | | | | | | |
| undetermined mite (distinct) | | | | | 4 | |
| **Subphylum Crustacea** | | | | | | |
| **Class Ostracoda** | | | 2 | | | |
| **Candonidae** | | | | | | |
| **Cypridinae** | 89 | 42 | 17 | | 87 | 9 |
| **Cypridosidae** | | | | 180 | | |
| **Ilyocyprididae** | | | | | | |
| **Amphipoda** | | | | | | |
| *Hyalella* | | | | | | 153 |
| **Phylum Mollusca** | | | | | | |
| **Class Gastropoda** | | | | | | |
| **Lymnaeidae** | | | | | | |
| *Fossaria* | | | | | | 3 |
| **Physidae** | | | | | | |
| *Physa/Physella* | | | | | | |
| **Class Bivalvia** | | | | | | |
| **Pelycepoda** | | | | | | |
| **Sphaeriidae** | | | | | | |
| *Pisidium* | 24 | | | | | |
| **Phylum Platyhelmenthes** | | | | | | |
| **Class Turbellaria** | | | | | | |
| **Tricladida** | | | | | | |
| **Planariidae** | | 26 | 8 | 2 | | 14 |
| **Phylum Nematoda** | 8 | | | | | |
| **Phylum Annelida** | | | | | | |
| **Class Oligochaeta** | | | | | | |
| **Lumbriculidae** | 3 | | | | | |
| **Enchytraeidae** | | | | | | |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DWS03-042 | DWS03-043 | DRI-050&051 | DRI05-061 | DRI05-281 | DWS03-049 |
|---|---|---|---|---|---|---|
| **Date Sampled** | 10/12/2003 | 10/12/2003 | 07/27/2004 | 07/21/2005 | 11/06/2005 | 10/13/2003 |
| **Spring Name** | Deer Sp. | White River Source | White River Source | White River Source | White River Source | Unnamed Sp. |
| **Sample Type** | Composite | Composite | Composite | Composite | Composite | Composite |
| **Location** | T13N-R58E-NE13 | T13N-R58E-NE35 | T13N-R58E-NE35 | T13N-R58E-NE35 | T13N-R58E-NE35 | T15N-R63E-NE7 |
| **Mountain Range** | White Pine | White Pine | White Pine | White Pine | White Pine | Egan |
| **Naididae** | 26 | | | | | |
| *Pristina* | | | | | | |
| *Pristinella* | | | | | | |
| *Nais* | | | | | | |
| **Tubificidae** | | 1 | | | | |
| **Megadrili** | | | | | | |
| **Orthocladiinae ND** | | | 24 | 25 | 75 | |
| **Orthocladius ND** | | | | | 1 | |
| ***Eukieffriella* ND** | | | | | | |
| **Baetidae ND** | | | | | 3 | |
| ***Baetis* ND** | | | | | | |
| **Limnephilidae ND** | | | | | | |
| **Elmidae ND** | | | | | | |
| **Brachycerous Dipteran pupa ND** | | | | | | |
| **Zygoptera ND** | | | | | | |
| | | | | | | |
| **TOTAL Benthic Organisms** | 205 | 282 | 591 | 318 | 308 | 256 |
| **Total Distinct Benthic Organisms** | 205 | 282 | 567 | 293 | 229 | 256 |
| **Sample Sorter** | M. Delgrego | M. Delgrego | M. Delgrego | Donaldson/Rosamond | | M. Delgrego |
| **Taxonomist** | C. Rosamond | C. Rosamond | C. Rosamond | C. Rosamond | C. Rosamond | C. Rosamond |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DWS03-042 | DWS03-043 | DRI-050&051 | DRI05-061 | DRI05-281 | DWS03-049 |
|---|---|---|---|---|---|---|
| **Date Sampled** | 10/12/2003 | 10/12/2003 | 07/27/2004 | 07/21/2005 | 11/06/2005 | 10/13/2003 |
| **Spring Name** | Deer Sp. | White River Source | White River Source | White River Source | White River Source | Unnamed Sp. |
| **Sample Type** | Composite | Composite | Composite | Composite | Composite | Composite |
| **Location** | T13N-R58E-NE13 | T13N-R58E-NE35 | T13N-R58E-NE35 | T13N-R58E-NE35 | T13N-R58E-NE35 | T15N-R63E-NE7 |
| **Mountain Range** | White Pine | White Pine | White Pine | White Pine | White Pine | Egan |
| | | | | | | |
| **METRICS** | | | | | | |
| ***Diversity & Richness*** | | | | | | |
| Richness (distinct benthic taxa only) | 14 | 21 | 31 | 17 | 18 | 14 |
| ***Compositional*** | | | | | | |
| % EPT | 7.3 | 50.0 | 13.7 | 6.3 | 13.3 | 19.9 |
| % Ephemeroptera | 2.9 | 44.7 | 9.8 | 2.2 | 9.7 | 14.8 |
| % Plecoptera | 2.0 | 4.6 | 3.9 | 4.1 | 3.6 | 1.6 |
| % Trichoptera | 2.4 | 0.7 | 0.0 | 0.0 | 0.0 | 3.5 |
| ***HBI-related*** | | | | | | |
| Community Tolerance Value | 7.17 | 5.55 | 5.57 | 6.59 | 6.12 | 4.29 |
| % Sensitive EPT | 0.00 | 7.09 | 2.54 | 3.77 | 0.97 | 1.17 |
| % Insensitive EPT | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| % Sensitive (all organisms) | 0.00 | 7.80 | 4.57 | 3.77 | 0.97 | 1.17 |
| % Insensitive (all organisms) | 0.00 | 0.35 | 0.17 | 0.00 | 0.00 | 0.00 |
| ***Functional Feeding*** | | | | | | |
| % Shredders | 4.39 | 3.55 | 2.71 | 4.09 | 3.25 | 3.13 |
| % Scrapers | 0.00 | 2.13 | 1.52 | 1.57 | 1.30 | 1.17 |
| % Collector-Filterers | 20.98 | 0.00 | 0.34 | 0.00 | 0.32 | 7.03 |
| % Collector-Gatherers | 65.37 | 81.56 | 89.68 | 88.05 | 89.29 | 79.69 |
| % Predators | 9.27 | 12.77 | 5.75 | 6.29 | 4.55 | 6.64 |
| % Other | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Behavioral (Habit)** | | | | | | |
| % Swimmers | 2.93 | 43.26 | 8.29 | 0.63 | 8.44 | 74.61 |
| % Clingers | 0.98 | 16.31 | 9.81 | 11.32 | 5.84 | 14.84 |
| % Sprawlers | 60.49 | 39.72 | 64.64 | 74.21 | 47.73 | 7.81 |
| % Climbers | 10.24 | 0.00 | 1.18 | 0.00 | 0.00 | 0.00 |
| % Burrowers | 25.37 | 0.71 | 15.23 | 13.21 | 35.39 | 0.39 |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DWS03-050 | DWS03-051 | DRI04-056&057 | DWS03-044-47 | DRI05-063 | DRI05-280 |
|---|---|---|---|---|---|---|
| **Date Sampled** | 10/30/2003 | 10/14/2003 | 07/29/2004 | 07/26/2004 | 07/20/2005 | 11/06/2005 |
| **Spring Name** | Water Cyn. Sp. | Upper Riggs Sp. | Upper Riggs Sp. | WR2 | WR2 | WR2 |
| **Sample Type** | Composite | Composite | Composite | Composite | Composite | Composite |
| **Location** | T13N-R63E-NW19 | T7S-66E-NW6 | T7S-R66E-NW6 | T14N-R64E-SW8 | T14N-R64E-SW8 | T14N-R64E-SW8 |
| **Mountain Range** | Egan | Delamar | Delamar | Egan | Egan | Egan |
| **Phylum Arthropoda** | | | | | | |
| **Class Insecta** | | | | | | |
| **Ephemeroptera** | | | | | | |
| **Ameletidae** | | | | | | |
| *Ameletus* | | | | | 2 | |
| **Baetidae** | | | | | | |
| *Baetis* | 4 | | 43 | 11 | | |
| *Diphetor hageni* | | | | | | |
| *Fallceon quilleri* | | | 31 | | | |
| *Magnus* | | | | | | 1 |
| *Baetis (tricaudatus)* | | | | | | |
| *Baetis (bicaudatus)* | | | | | | 70 |
| **Heptageniidae** | | | | | | |
| *Cinygmula* | | | | | | |
| **Leptophlebiidae** | | | | | | |
| **Plecoptera** | | | | | | |
| **Chloroperlidae** | | | | | | |
| *Sweltsa* | | | | | | |
| **Nemouridae** | | | | | | |
| *Malenka* | | | | | | |
| *Zapada* | | | | | 15 | 7 |
| *Z. cinctipes* | | | | 4 | | |
| **Perlidae** | | | | | | |
| *Hesperoperla* | | | | | | |
| **Perlodidae** | | | | | 1 | |
| *Isoperla* | | | | | | |
| **Pteronarcyidae** | | | | | | |
| *Pteronarcella* | | | | | | |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DWS03-050 | DWS03-051 | DRI04-056&057 | DWS03-044-47 | DRI05-063 | DRI05-280 |
|---|---|---|---|---|---|---|
| **Date Sampled** | 10/30/2003 | 10/14/2003 | 07/29/2004 | 07/26/2004 | 07/20/2005 | 11/06/2005 |
| **Spring Name** | Water Cyn. Sp. | Upper Riggs Sp. | Upper Riggs Sp. | WR2 | WR2 | WR2 |
| **Sample Type** | Composite | Composite | Composite | Composite | Composite | Composite |
| **Location** | T13N-R63E-NW19 | T7S-R66E-NW6 | T7S-R66E-NW6 | T14N-R64E-SW8 | T14N-R64E-SW8 | T14N-R64E-SW8 |
| **Mountain Range** | Egan | Delamar | Delamar | Egan | Egan | Egan |
| **Trichoptera** | | | | | | |
| **Brachycentridae** | | | | | | |
| *Brachycentrus* | | | | | | |
| *Micrasema* | | | | | | |
| **Hydropsychidae** | | | | | | |
| *Ceratopsyche* | | | | | | |
| *Cheumatopsyche* | | | 32 | | | |
| **Hydroptilidae** | | | | | | |
| *Ochrotrichia* | | | | | | |
| **Lepidostomatidae** | | | | | | |
| *Lepidostoma* | | | | | | |
| **Leptoceridae** | | | 1 | | | |
| **Limnephillidae** | 4 | | 1 | | 5 | |
| *Eocosmoecus* | | | | | | |
| *Hesperophylax* | | | | | | 1 |
| *Limnephilus* | | | | | | |
| **Odontoceridae** | | | | | | |
| *Marilia* | | | 1 | | | |
| **Philopotamidae** | | | | | | |
| *Wormaldia* | | | | | | |
| **Rhyacophilidae** | | | | | | |
| *Rhyacophila* | | | | | | |
| *R. acropedes gr (= brunnea-vemna)* | | | | | | |
| *R. vofixa gr* | | | | | | 1 |
| **Coleoptera** | | | | | | |
| **Dytiscidae** | | | | | | |
| *Agabus* | | | | | | |
| *Oreodytes,* larva | | | 1 | | | |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DWS03-050 | DWS03-051 | DRI04-056&057 | DWS03-044-47 | DRI05-063 | DRI05-280 |
|---|---|---|---|---|---|---|
| **Date Sampled** | 10/30/2003 | 10/14/2003 | 07/29/2004 | 07/26/2004 | 07/20/2005 | 11/06/2005 |
| **Spring Name** | Water Cyn. Sp. | Upper Riggs Sp. | Upper Riggs Sp. | WR2 | WR2 | WR2 |
| **Sample Type** | Composite | Composite | Composite | Composite | Composite | Composite |
| **Location** | T13N-R63E-NW19 | T7S-R66E-NW6 | T7S-R66E-NW6 | T14N-R64E-SW8 | T14N-R64E-SW8 | T14N-R64E-SW8 |
| **Mountain Range** | Egan | Delamar | Delamar | Egan | Egan | Egan |
| **Elmidae** | | | | | | |
| *Cleptelmis* | | | | | | |
| *Heterlimnius* | | | | | | |
| **Microsporidae** | | | | | | |
| **Diptera** | | | | | | |
| **Ceratopogonidae** | | | | | | |
| *Atrichopogon* | | | | | | |
| *Bezzia/ Palpomyia* | | | | | 2 | |
| *Culicoides* | | | 1 | | | |
| *Probezzia* | | | | | | |
| **Chironomidae** | | | | | | |
| Chironominae | | | | | | |
| Chironomini | | | | | | |
| *Apedilum* | | | | | | |
| *Paratendipes* | | | 20 | | | |
| *Polypedilum* | | | | | | |
| *Polypedilum sf simulans-digitifer* | | | | | | |
| *Tribelos* | | | | | | |
| Diamesinae | | | | | | |
| *Diamesa* | | | | | | |
| *Pagastia* | | | | | | |
| *Pseudodiamesa* | | | | | | |
| Orthocladiinae | | | | | | |
| *Brillia* | | | | | | 3 |
| *Corynoneura* | | | 15 | | | |
| *Chaetocladius* | | | | 2 | | |
| *Cricotopus (cf Bicinctus Gr)* | | | | | | |
| *Cricotopus/Orthocladius* | | | | | | |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DWS03-050 | DWS03-051 | DRI04-056&057 | DWS03-044-47 | DRI05-063 | DRI05-280 |
|---|---|---|---|---|---|---|
| **Date Sampled** | 10/30/2003 | 10/14/2003 | 07/29/2004 | 07/26/2004 | 07/20/2005 | 11/06/2005 |
| **Spring Name** | Water Cyn. Sp. | Upper Riggs Sp. | Upper Riggs Sp. | WR2 | WR2 | WR2 |
| **Sample Type** | Composite | Composite | Composite | Composite | Composite | Composite |
| **Location** | T13N-R63E-NW19 | T7S-R66E-NW6 | T7S-R66E-NW6 | T14N-R64E-SW8 | T14N-R64E-SW8 | T14N-R64E-SW8 |
| **Mountain Range** | Egan | Delamar | Delamar | Egan | Egan | Egan |
| *Eukieffriella* | | | | | 9 | |
| *Eukiefferiella (Brehmi Gr)* | | | | | | |
| *Eukiefferiella (Claripennis Gr)* | 3 | | | | | |
| *Eukiefferiella (Devonica Gr)* | | | | | | |
| *Eukiefferiella (Gracei Gr)* | | | | | | |
| *Eukiefferiella (Rectangularis Gr)* | 4 | | | | | |
| *Limnophyes* | | | | | | |
| *Paramtriocnemus/Paraphaenocladius* | | | 36 | | | 4 |
| *Rheocricotopus* | | | | 9 | | 1 |
| *Rheosmittia* | | | | | | |
| *Theinemanniella* | | | 6 | 6 | 15 | |
| *Tvtenia* | | | | | 1 | |
| *Tvtenia (bavarica Gr)* | | | | | | |
| Podonominae | | | | | | |
| *Boreochlus* | | | | | | |
| Tanypodinae | | | | | | |
| *Apsectrotanypus* | | | | | | |
| *Nilotanypus* | | | | | | |
| *Paramerina* | | 1 | 6 | | | |
| *Radotanypus* | | | | | | |
| *Thienemamannimyia* Gr | | | 18 | | | |
| Tanytarsini | | | | | | |
| *Micropsectra* | | | 34 | | | |
| *Paratanytarsus* | | | | | | |
| *Tanytarsus* | | | 34 | | | 2 |
| *Rheotanytarsus* | | | 116 | | | |
| **Culicidae** | | | | | | |
| *Anopheles* | | | 4 | | | |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DWS03-050 | DWS03-051 | DRI04-056&057 | DWS03-044-47 | DRI05-063 | DRI05-280 |
|---|---|---|---|---|---|---|
| **Date Sampled** | 10/30/2003 | 10/14/2003 | 07/29/2004 | 07/26/2004 | 07/20/2005 | 11/06/2005 |
| **Spring Name** | Water Cyn. Sp. | Upper Riggs Sp. | Upper Riggs Sp. | WR2 | WR2 | WR2 |
| **Sample Type** | Composite | Composite | Composite | Composite | Composite | Composite |
| **Location** | T13N-R63E-NW19 | T7S-R66E-NW6 | T7S-R66E-NW6 | T14N-R64E-SW8 | T14N-R64E-SW8 | T14N-R64E-SW8 |
| **Mountain Range** | Egan | Delamar | Delamar | Egan | Egan | Egan |
| **Dixidae** | | | | | | |
| *Dixa* | | | | | | 1 |
| *Dixella* | | | 1 | | | |
| *Chelifera* | | | | | | |
| **Ephydridae** | | | | | | |
| *Hydrellia* | | | 1 | | | |
| *Scatella* | | | | | | |
| **Muscidae** | | | | | | |
| **Psychodidae** | | | | | | |
| *Psychoda* | | | | | | |
| *Pericoma/ Telmatoscopus* | | | | | | 2 |
| **Simuliidae** | | | | | | |
| *Simulium* | 1 | | 6 | 4 | | 3 |
| **Stratiomyidae** | | | | | | |
| *Caloparyphus* | | | 29 | | | |
| *Euparyphus* | | | 1 | | | |
| *Stratiomys* | | | | | | |
| **Thaumaleidae** | | | | | | |
| *Thaumalea* | | | | | | |
| **Tipulidae** | | | | | | |
| *Dicranota* | | | | | | 3 |
| *Hexatoma* | | | | | | |
| *Holorusia* | | | 1 | | | |
| *Pedicia* | | | | | | |
| **Odonata** | | | | | | |
| **Coenagrionidae** | | | | | | |
| *Argia* | | | 4 | | | |
| *Argia plana* | | | | | | |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DWS03-050 | DWS03-051 | DRI04-056&057 | DWS03-044-47 | DRI05-063 | DRI05-280 |
|---|---|---|---|---|---|---|
| **Date Sampled** | 10/30/2003 | 10/14/2003 | 07/29/2004 | 07/26/2004 | 07/20/2005 | 11/06/2005 |
| **Spring Name** | Water Cyn. Sp. | Upper Riggs Sp. | Upper Riggs Sp. | WR2 | WR2 | WR2 |
| **Sample Type** | Composite | Composite | Composite | Composite | Composite | Composite |
| **Location** | T13N-R63E-NW19 | T7S-R66E-NW6 | T7S-R66E-NW6 | T14N-R64E-SW8 | T14N-R64E-SW8 | T14N-R64E-SW8 |
| **Mountain Range** | Egan | Delamar | Delamar | Egan | Egan | Egan |
| **Gomphidae** | | | | | | |
| *Stylurus* | | | 1 | | | |
| *Lestes* | | | 1 | | | |
| **Hemiptera** | | | | | | |
| **Naucoridae** | | | | | | |
| *Ambrysus* | | | 3 | | | |
| **Mites** | | | | | | |
| **Acari (distinct)** | | | | | | |
| **Arrinuridae** | | | | | | |
| *Arrenurus* | | | | | | |
| **Aturidae** | | | | | | |
| *Aturus* | | | | | | |
| **Hydrodromidae** | | | | | | |
| *Hydrodroma* | | | | | | |
| **Hydrovilziidae** | | | | | | |
| *Hydrovolzia* | | | | | | |
| *Partnunia* | | | | | | |
| **Hygrobatidae** | | | | | | |
| *Atractides* | | | 1 | | | |
| *Corticacarus* | | | 3 | | | |
| **Lebertiidae** | | | | | | |
| *Lebertia* | | | | | | 1 |
| **Limnesiidae** | | | | | | |
| *Neotyrellia* | | | | | | |
| **Oribatei (**genus key unavailable for northern hemisphere) | | | | | | |
| **Sperchontidae** | | | | | | |
| *Sperchon* | | | 1 | 4 | 1 | |
| **Stygothrombidiidae** | | | | | | |
| *Thyadinae* | | | | | | |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DWS03-050 | DWS03-051 | DRI04-056&057 | DWS03-044-47 | DRI05-063 | DRI05-280 |
|---|---|---|---|---|---|---|
| **Date Sampled** | 10/30/2003 | 10/14/2003 | 07/29/2004 | 07/26/2004 | 07/20/2005 | 11/06/2005 |
| **Spring Name** | Water Cyn. Sp. | Upper Riggs Sp. | Upper Riggs Sp. | WR2 | WR2 | WR2 |
| **Sample Type** | Composite | Composite | Composite | Composite | Composite | Composite |
| **Location** | T13N-R63E-NW19 | T7S-R66E-NW6 | T7S-R66E-NW6 | T14N-R64E-SW8 | T14N-R64E-SW8 | T14N-R64E-SW8 |
| **Mountain Range** | Egan | Delamar | Delamar | Egan | Egan | Egan |
| **Torrenticolidae** | | | | | | |
| *Torrenticola* | | | | | | |
| undetermined mite (distinct) | | | | 1 | | |
| **Subphylum Crustacea** | | | | | | |
| **Class Ostracoda** | | | 3 | | | |
| **Candonidae** | | | 49 | | | |
| **Cypridinae** | 5 | 7 | 10 | 195 | | 67 |
| **Cypridosidae** | | | | | 149 | |
| **Ilyocyprididae** | | | | | | |
| **Amphipoda** | | | | | | |
| *Hyalella* | | | | 56 | 111 | 155 |
| **Phylum Mollusca** | | | | | | |
| **Class Gastropoda** | | | | | | |
| **Lymnaeidae** | | | | | | |
| *Fossaria* | | | | | | |
| **Physidae** | | | | | | |
| *Physa/Physella* | | 2 | 24 | | | |
| **Class Bivalvia** | | | | | | |
| **Pelycepoda** | | | | | | |
| **Sphaeriidae** | | | | | | |
| *Pisidium* | 1 | | | | | 3 |
| **Phylum Platyhelmenthes** | | | | | | |
| **Class Turbellaria** | | | | | 7 | |
| **Tricladida** | | | | | | |
| **Planariidae** | 1 | | | 1 | | |
| **Phylum Nematoda** | 11 | | 31 | 3 | | |
| **Phylum Annelida** | | | | | | |
| **Class Oligochaeta** | | | | | | |
| **Lumbriculidae** | | | | | | |
| **Enchytraeidae** | | | | | | 1 |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DWS03-050 | DWS03-051 | DRI04-056&057 | DWS03-044-47 | DRI05-063 | DRI05-280 |
|---|---|---|---|---|---|---|
| **Date Sampled** | 10/30/2003 | 10/14/2003 | 07/29/2004 | 07/26/2004 | 07/20/2005 | 11/06/2005 |
| **Spring Name** | Water Cyn. Sp. | Upper Riggs Sp. | Upper Riggs Sp. | WR2 | WR2 | WR2 |
| **Sample Type** | Composite | Composite | Composite | Composite | Composite | Composite |
| **Location** | T13N-R63E-NW19 | T7S-R66E-NW6 | T7S-R66E-NW6 | T14N-R64E-SW8 | T14N-R64E-SW8 | T14N-R64E-SW8 |
| **Mountain Range** | Egan | Delamar | Delamar | Egan | Egan | Egan |
| **Naididae** | | 1 | | 11 | | |
| *Pristina* | | | 42 | | | |
| *Pristinella* | | | | | | 6 |
| *Nais* | | | | | | |
| **Tubificidae** | 23 | | 9 | | 2 | 14 |
| **Megadrili** | | | | | | |
| **Orthocladiinae ND** | | | | | | 1 |
| **Orthocladius ND** | | | | | | |
| ***Eukieffriella* ND** | | | | | | |
| **Baetidae ND** | | | | | 1 | 3 |
| ***Baetis* ND** | | | | | | |
| **Limnephilidae ND** | | | | | | |
| **Elmidae ND** | | | | | | |
| **Brachycerous Dipteran pupa ND** | | | | | | |
| **Zygoptera ND** | | | 4 | | | |
| | | | | | | |
| **TOTAL Benthic Organisms** | 57 | 11 | 625 | 307 | 321 | 350 |
| **Total Distinct Benthic Organisms** | 57 | 11 | 621 | 307 | 320 | 346 |
| **Sample Sorter** | M. Delgrego | M. Delgrego | M. Delgrego | M. Delgrego | D. Henneberry | D. Henneberry |
| **Taxonomist** | C. Rosamond | C. Rosamond | C. Rosamond | C. Rosamond | C. Rosamond | C. Rosamond |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DWS03-050 | DWS03-051 | DRI04-056&057 | DWS03-044-47 | DRI05-063 | DRI05-280 |
|---|---|---|---|---|---|---|
| **Date Sampled** | 10/30/2003 | 10/14/2003 | 07/29/2004 | 07/26/2004 | 07/20/2005 | 11/06/2005 |
| **Spring Name** | Water Cyn. Sp. | Upper Riggs Sp. | Upper Riggs Sp. | WR2 | WR2 | WR2 |
| **Sample Type** | Composite | Composite | Composite | Composite | Composite | Composite |
| **Location** | T13N-R63E-NW19 | T7S-R66E-NW6 | T7S-R66E-NW6 | T14N-R64E-SW8 | T14N-R64E-SW8 | T14N-R64E-SW8 |
| **Mountain Range** | Egan | Delamar | Delamar | Egan | Egan | Egan |
| | | | | | | |
| **METRICS** | | | | | | |
| ***Diversity & Richness*** | | | | | | |
| Richness (distinct benthic taxa only) | 10 | 4 | 39 | 13 | 13 | 20 |
| ***Compositional*** | | | | | | |
| % EPT | 14.0 | 0.0 | 17.4 | 4.9 | 7.2 | 22.9 |
| % Ephemeroptera | 7.0 | 0.0 | 11.8 | 3.6 | 0.6 | 20.3 |
| % Plecoptera | 0.0 | 0.0 | 0.0 | 1.3 | 5.0 | 2.0 |
| % Trichoptera | 7.0 | 0.0 | 5.6 | 0.0 | 1.6 | 0.6 |
| ***HBI-related*** | | | | | | |
| Community Tolerance Value | 7.63 | 7.82 | 6.20 | 6.89 | 5.90 | 5.09 |
| % Sensitive EPT | 0.00 | 0.00 | 0.16 | 0.00 | 0.62 | 0.29 |
| % Insensitive EPT | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| % Sensitive (all organisms) | 0.00 | 0.00 | 0.16 | 0.00 | 0.62 | 0.29 |
| % Insensitive (all organisms) | 40.35 | 0.00 | 1.44 | 0.00 | 0.62 | 4.29 |
| ***Functional Feeding*** | | | | | | |
| % Shredders | 7.02 | 0.00 | 0.48 | 1.30 | 6.23 | 3.14 |
| % Scrapers | 0.00 | 18.18 | 3.83 | 0.00 | 0.00 | 0.00 |
| % Collector-Filterers | 3.51 | 0.00 | 30.03 | 1.30 | 0.00 | 2.29 |
| % Collector-Gatherers | 87.72 | 72.73 | 58.15 | 95.44 | 90.03 | 92.29 |
| % Predators | 1.75 | 9.09 | 6.55 | 1.95 | 1.25 | 1.43 |
| % Other | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Behavioral (Habit)** | | | | | | |
| % Swimmers | 7.02 | 0.00 | 12.78 | 21.82 | 35.20 | 64.86 |
| % Clingers | 3.51 | 18.18 | 30.19 | 2.93 | 0.62 | 1.43 |
| % Sprawlers | 29.82 | 72.73 | 24.92 | 69.71 | 60.44 | 24.57 |
| % Climbers | 0.00 | 0.00 | 11.34 | 0.00 | 0.00 | 0.57 |
| % Burrowers | 59.65 | 9.09 | 19.81 | 5.21 | 1.25 | 7.71 |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DWS03-048-49 | DRI05-065 | DRI05-279 | DRI04-052&053 | DRI05-064 | DRI05-276 |
|---|---|---|---|---|---|---|
| **Date Sampled** | 07/27/2004 | 07/23/2005 | 11/05/2005 | 07/28/2004 | 07/22/2005 | 11/05/2005 |
| **Spring Name** | Kalamazoo Sp. | Kalamazoo Sp. | Kalamazoo Sp. | Headwaters Sp. | Headwaters Sp. | Headwaters Sp. |
| **Sample Type** | Composite | Composite | Composite | Composite | Composite | Composite |
| **Location** | T20N-R66E-SW30 | T20N-R66E-SW30 | T20N-R66E-SW30 | T6N-R68E-SW23 | T6N-R68E-SW23 | T6N-R68E-SW23 |
| **Mountain Range** | Schell Creek | Schell Creek | Schell Creek | Wilson Creek | Wilson Creek | Wilson Creek |
| **Phylum Arthropoda** | | | | | | |
| **Class Insecta** | | | | | | |
| **Ephemeroptera** | | | | | | |
| **Ameletidae** | | | | | | |
| *Ameletus* | | | | | | |
| **Baetidae** | | | | | | |
| *Baetis* | 22 | | | 79 | | |
| *Diphetor hageni* | | 1 | | | | |
| *Fallceon quilleri* | 1 | | | | | |
| *Magnus* | | | | | 100 | 210 |
| *Baetis (tricaudatus)* | | 4 | 2 | | | |
| *Baetis (bicaudatus)* | | 2 | | | | |
| **Heptageniidae** | | | | | | |
| *Cinygmula* | | | 2 | | | |
| **Leptophlebiidae** | 1 | | | | | |
| **Plecoptera** | | | | | | |
| **Chloroperlidae** | | | | | | |
| *Sweltsa* | | | | 1 | | |
| **Nemouridae** | | | | | | |
| *Malenka* | 1 | 4 | | | | |
| *Zapada* | | | 3 | | | |
| *Z. cinctipes* | 3 | | | | | |
| **Perlidae** | | | | | | |
| *Hesperoperla* | 1 | 9 | | | | |
| **Perlodidae** | | | | | | |
| *Isoperla* | | | | | | |
| **Pteronarcyidae** | | | | | | |
| *Pteronarcella* | | | | | | |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DWS03-048-49 | DRI05-065 | DRI05-279 | DRI04-052&053 | DRI05-064 | DRI05-276 |
|---|---|---|---|---|---|---|
| **Date Sampled** | 07/27/2004 | 07/23/2005 | 11/05/2005 | 07/28/2004 | 07/22/2005 | 11/05/2005 |
| **Spring Name** | Kalamazoo Sp. | Kalamazoo Sp. | Kalamazoo Sp. | Headwaters Sp. | Headwaters Sp. | Headwaters Sp. |
| **Sample Type** | Composite | Composite | Composite | Composite | Composite | Composite |
| **Location** | T20N-R66E-SW30 | T20N-R66E-SW30 | T20N-R66E-SW30 | T6N-R68E-SW23 | T6N-R68E-SW23 | T6N-R68E-SW23 |
| **Mountain Range** | Schell Creek | Schell Creek | Schell Creek | Wilson Creek | Wilson Creek | Wilson Creek |
| **Trichoptera** | | | | | | |
| **Brachycentridae** | | | | | | |
| *Brachycentrus* | | 1 | | | | |
| *Micrasema* | 1 | 22 | 47 | | | |
| **Hydropsychidae** | | | 2 | | | |
| *Ceratopsyche* | 1 | 2 | | | | |
| *Cheumatopsyche* | | | | | | |
| **Hydroptilidae** | | | | | | |
| *Ochrotrichia* | | | | | | |
| **Lepidostomatidae** | | | | | | |
| *Lepidostoma* | 19 | 21 | 76 | 1 | | |
| **Leptoceridae** | | | | | | |
| **Limnephillidae** | | | | | | |
| *Eocosmoecus* | | | | | | |
| *Hesperophylax* | | | | 2 | 4 | 6 |
| *Limnephilus* | | | | | | |
| **Odontoceridae** | | | | | | |
| *Marilia* | | | | | | |
| **Philopotamidae** | | | | | | |
| *Wormaldia* | | | | | | |
| **Rhyacophilidae** | | | | | | |
| *Rhyacophila* | | 1 | | | | |
| *R. acropedes gr (= brunnea-vemna)* | | | 1 | | | |
| *R. vofixa Gr* | | | | | | |
| **Coleoptera** | | | | | | |
| **Dytiscidae** | | | | | | |
| *Agabus* | | | | 5 | 1 | |
| *Oreodytes,* larva | | | | | | |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DWS03-048-49 | DRI05-065 | DRI05-279 | DRI04-052&053 | DRI05-064 | DRI05-276 |
|---|---|---|---|---|---|---|
| **Date Sampled** | 07/27/2004 | 07/23/2005 | 11/05/2005 | 07/28/2004 | 07/22/2005 | 11/05/2005 |
| **Spring Name** | Kalamazoo Sp. | Kalamazoo Sp. | Kalamazoo Sp. | Headwaters Sp. | Headwaters Sp. | Headwaters Sp. |
| **Sample Type** | Composite | Composite | Composite | Composite | Composite | Composite |
| **Location** | T20N-R66E-SW30 | T20N-R66E-SW30 | T20N-R66E-SW30 | T6N-R68E-SW23 | T6N-R68E-SW23 | T6N-R68E-SW23 |
| **Mountain Range** | Schell Creek | Schell Creek | Schell Creek | Wilson Creek | Wilson Creek | Wilson Creek |
| **Elmidae** | | | | | | |
| *Cleptelmis* | 7 | 5 | 2 | 5 | | |
| *Heterlimnius* | 27 | 5 | 54 | | | |
| **Microsporidae** | | | | | | |
| **Diptera** | | | | | | |
| **Ceratopogonidae** | | | | | | |
| *Atrichopogon* | | | | | | |
| *Bezzia/ Palpomyia* | | | | | | |
| *Culicoides* | | | | | | |
| *Probezzia* | | | | | | 1 |
| **Chironomidae** | | | | | | |
| Chironominae | | | | | | |
| Chironomini | | | | | | |
| *Apedilum* | | | | | | |
| *Paratendipes* | | | | | | |
| *Polypedilum* | | | | | | 9 |
| *Polypedilum sf simulans-digitifer* | | | | | | |
| *Tribelos* | | | | | 1 | |
| Diamesinae | | | | | 1 | |
| *Diamesa* | | 3 | | | | |
| *Pagastia* | | | | | | |
| *Pseudodiamesa* | | 1 | | | | |
| Orthocladiinae | | | | | 1 | |
| *Brillia* | | 2 | 3 | | 1 | |
| *Corynoneura* | 4 | 4 | | 13 | 2 | |
| *Chaetocladius* | 1 | | | | | |
| *Cricotopus (cf Bicinctus Gr)* | | 1 | | | | |
| *Cricotopus/Orthocladius* | | 5 | | 37 | 1 | |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DWS03-048-49 | DRI05-065 | DRI05-279 | DRI04-052&053 | DRI05-064 | DRI05-276 |
|---|---|---|---|---|---|---|
| **Date Sampled** | 07/27/2004 | 07/23/2005 | 11/05/2005 | 07/28/2004 | 07/22/2005 | 11/05/2005 |
| **Spring Name** | Kalamazoo Sp. | Kalamazoo Sp. | Kalamazoo Sp. | Headwaters Sp. | Headwaters Sp. | Headwaters Sp. |
| **Sample Type** | Composite | Composite | Composite | Composite | Composite | Composite |
| **Location** | T20N-R66E-SW30 | T20N-R66E-SW30 | T20N-R66E-SW30 | T6N-R68E-SW23 | T6N-R68E-SW23 | T6N-R68E-SW23 |
| **Mountain Range** | Schell Creek | Schell Creek | Schell Creek | Wilson Creek | Wilson Creek | Wilson Creek |
| *Eukieffriella* | | 2 | | 4 | 1 | 1 |
| *Eukiefferiella (Brehmi Gr)* | | | | | | |
| *Eukiefferiella (Claripennis Gr)* | | | | | | |
| *Eukiefferiella (Devonica Gr)* | | | | | | |
| *Eukiefferiella (Gracei Gr)* | 6 | 74 | 82 | | | |
| *Eukiefferiella (Rectangularis Gr)* | | | | | | |
| *Limnophyes* | | 4 | | | | |
| *Paramtriocnemus/Paraphaenocladius* | | | | | 1 | |
| *Rheocricotopus* | | | | | | |
| *Rheosmittia* | | | | | | |
| *Theinemanniella* | | | | 4 | | |
| *Tvtenia* | | | | 1 | | |
| *Tvtenia (bavarica Gr)* | | 3 | | | | |
| Podonominae | | | | | | |
| *Boreochlus* | | | | | | |
| Tanypodinae | | | | | | |
| *Apsectrotanypus* | | | | | | |
| *Nilotanypus* | | | | | | |
| *Paramerina* | | | | 1 | | |
| *Radotanypus* | | | | | | |
| *Thienemamannimyia* Gr | | | | | | |
| Tanytarsini | | | | | | |
| *Micropsectra* | | | | | 51 | |
| *Paratanytarsus* | | | | | | |
| *Tanytarsus* | | | | 34 | | 7 |
| *Rheotanytarsus* | 14 | 7 | | | | |
| **Culicidae** | | | | | | |
| *Anopheles* | | | | | | |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DWS03-048-49 | DRI05-065 | DRI05-279 | DRI04-052&053 | DRI05-064 | DRI05-276 |
|---|---|---|---|---|---|---|
| **Date Sampled** | 07/27/2004 | 07/23/2005 | 11/05/2005 | 07/28/2004 | 07/22/2005 | 11/05/2005 |
| **Spring Name** | Kalamazoo Sp. | Kalamazoo Sp. | Kalamazoo Sp. | Headwaters Sp. | Headwaters Sp. | Headwaters Sp. |
| **Sample Type** | Composite | Composite | Composite | Composite | Composite | Composite |
| **Location** | T20N-R66E-SW30 | T20N-R66E-SW30 | T20N-R66E-SW30 | T6N-R68E-SW23 | T6N-R68E-SW23 | T6N-R68E-SW23 |
| **Mountain Range** | Schell Creek | Schell Creek | Schell Creek | Wilson Creek | Wilson Creek | Wilson Creek |
| **Dixidae** | | | | | | |
| *Dixa* | | | | | | |
| *Dixella* | | | | | | |
| *Chelifera* | | | 3 | | | |
| **Ephydridae** | | | | | | |
| *Hydrellia* | | | | | | |
| *Scatella* | | 1 | | 2 | | |
| **Muscidae** | | | | 1 | | |
| **Psychodidae** | | | | | | |
| *Psychoda* | | | | | | |
| *Pericoma/ Telmatoscopus* | | | | | | |
| **Simuliidae** | | | | | | |
| *Simulium* | | 1 | 7 | 118 | 19 | 3 |
| **Stratiomyidae** | | | | | | |
| *Caloparyphus* | | | | | | |
| *Euparyphus* | | | | | | |
| *Stratiomys* | 1 | | | | | |
| **Thaumaleidae** | | | | | | |
| *Thaumalea* | | | | | | |
| **Tipulidae** | | | | | | |
| *Dicranota* | | | 1 | | | |
| *Hexatoma* | | | 1 | | | |
| *Holorusia* | | | | | | |
| *Pedicia* | | | | | | |
| **Odonata** | | | | | | |
| **Coenagrionidae** | | | | | | |
| *Argia* | | | | | | |
| *Argia plana* | | | | | | |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DWS03-048-49 | DRI05-065 | DRI05-279 | DRI04-052&053 | DRI05-064 | DRI05-276 |
|---|---|---|---|---|---|---|
| **Date Sampled** | 07/27/2004 | 07/23/2005 | 11/05/2005 | 07/28/2004 | 07/22/2005 | 11/05/2005 |
| **Spring Name** | Kalamazoo Sp. | Kalamazoo Sp. | Kalamazoo Sp. | Headwaters Sp. | Headwaters Sp. | Headwaters Sp. |
| **Sample Type** | Composite | Composite | Composite | Composite | Composite | Composite |
| **Location** | T20N-R66E-SW30 | T20N-R66E-SW30 | T20N-R66E-SW30 | T6N-R68E-SW23 | T6N-R68E-SW23 | T6N-R68E-SW23 |
| **Mountain Range** | Schell Creek | Schell Creek | Schell Creek | Wilson Creek | Wilson Creek | Wilson Creek |
| **Gomphidae** | | | | | | |
| *Stylurus* | | | | | | |
| *Lestes* | | | | | | |
| **Hemiptera** | | | | | | |
| **Naucoridae** | | | | | | |
| *Ambrysus* | | | | | | |
| **Mites** | | | | | | |
| **Acari distinct** | | | | | | |
| **Arrinuridae** | | | | | | |
| *Arrenurus* | | | | | | |
| **Aturidae** | | | | | | |
| *Aturus* | 1 | | | | | |
| **Hydrodromidae** | | | | | | |
| *Hydrodroma* | | | | | | |
| **Hydrovilziidae** | | | | | | |
| *Hydrovolzia* | 5 | | | | | |
| *Partnunia* | 1 | | | | | |
| **Hygrobatidae** | | | | | | |
| *Atractides* | | | | | | |
| *Corticacarus* | | | | | | 1 |
| **Lebertiidae** | | | | | | |
| *Lebertia* | | | | 4 | 1 | 1 |
| **Limnesiidae** | | | | | | |
| *Neotyrellia* | | | | | | |
| **Oribatei (**genus key unavailable for northern hemisphere) | 1 | | 1 | | | |
| **Sperchontidae** | | | | | | |
| *Sperchon* | | | 1 | 3 | | 2 |
| **Stygothrombidiidae** | | | | | | |
| *Thyadinae* | | | | | | |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DWS03-048-49 | DRI05-065 | DRI05-279 | DRI04-052&053 | DRI05-064 | DRI05-276 |
|---|---|---|---|---|---|---|
| **Date Sampled** | 07/27/2004 | 07/23/2005 | 11/05/2005 | 07/28/2004 | 07/22/2005 | 11/05/2005 |
| **Spring Name** | Kalamazoo Sp. | Kalamazoo Sp. | Kalamazoo Sp. | Headwaters Sp. | Headwaters Sp. | Headwaters Sp. |
| **Sample Type** | Composite | Composite | Composite | Composite | Composite | Composite |
| **Location** | T20N-R66E-SW30 | T20N-R66E-SW30 | T20N-R66E-SW30 | T6N-R68E-SW23 | T6N-R68E-SW23 | T6N-R68E-SW23 |
| **Mountain Range** | Schell Creek | Schell Creek | Schell Creek | Wilson Creek | Wilson Creek | Wilson Creek |
| **Torrenticolidae** | | | | | | |
| *Torrenticola* | | | 3 | | | |
| undetermined mite (distinct) | 1 | | 1 | | | |
| **Subphylum Crustacea** | | | | | | |
| **Class Ostracoda** | | | | | | |
| **Candonidae** | | | 4 | | 4 | 1 |
| **Cypridinae** | | 2 | 1 | 64 | | 19 |
| **Cypridosidae** | | | | | | |
| **Ilyocyprididae** | | | | | 17 | |
| **Amphipoda** | | | | | | |
| *Hyalella* | 154 | 62 | 23 | | | |
| **Phylum Mollusca** | | | | | | |
| **Class Gastropoda** | | | | | | |
| **Lymnaeidae** | | | | | | |
| *Fossaria* | | | | | | |
| **Physidae** | | | | | | |
| *Physa/Physella* | | | | | | |
| **Class Bivalvia** | | | | | | |
| **Pelycepoda** | | | | | | |
| **Sphaeriidae** | | | | | | |
| *Pisidium* | 7 | 13 | 2 | 1 | | |
| **Phylum Platyhelmenthes** | | | | | | |
| **Class Turbellaria** | | | | | | |
| **Tricladida** | | | | | | |
| **Planariidae** | | | | | | |
| **Phylum Nematoda** | | | 1 | 17 | 14 | 4 |
| **Phylum Annelida** | | | | | | |
| **Class Oligochaeta** | | | | | | |
| **Lumbriculidae** | | | | | | 1 |
| **Enchytraeidae** | | 2 | 2 | | 1 | 3 |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DWS03-048-49 | DRI05-065 | DRI05-279 | DRI04-052&053 | DRI05-064 | DRI05-276 |
|---|---|---|---|---|---|---|
| **Date Sampled** | 07/27/2004 | 07/23/2005 | 11/05/2005 | 07/28/2004 | 07/22/2005 | 11/05/2005 |
| **Spring Name** | Kalamazoo Sp. | Kalamazoo Sp. | Kalamazoo Sp. | Headwaters Sp. | Headwaters Sp. | Headwaters Sp. |
| **Sample Type** | Composite | Composite | Composite | Composite | Composite | Composite |
| **Location** | T20N-R66E-SW30 | T20N-R66E-SW30 | T20N-R66E-SW30 | T6N-R68E-SW23 | T6N-R68E-SW23 | T6N-R68E-SW23 |
| **Mountain Range** | Schell Creek | Schell Creek | Schell Creek | Wilson Creek | Wilson Creek | Wilson Creek |
| **Naididae** | | | | 183 | | |
| *Pristina* | | | | | | |
| *Pristinella* | | | 1 | | 210 | 47 |
| *Nais* | | | 1 | | | 2 |
| **Tubificidae** | | 1 | 7 | | | |
| **Megadrili** | | | | | | |
| **Orthocladiinae ND** | | 11 | 6 | 16 | | |
| **Orthocladius ND** | | | | | | |
| ***Eukieffriella* ND** | | 4 | | | | |
| **Baetidae ND** | | 3 | 9 | | | |
| ***Baetis* ND** | | | | | 8 | |
| **Limnephilidae ND** | | | | | 5 | |
| **Elmidae ND** | 27 | | | | | |
| **Brachycerous Dipteran pupa ND** | 1 | | | | | |
| **Zygoptera ND** | | | | | | |
| | | | | | | |
| **TOTAL Benthic Organisms** | 308 | 283 | 349 | 596 | 444 | 318 |
| **Total Distinct Benthic Organisms** | 280 | 265 | 334 | 580 | 431 | 318 |
| **Sample Sorter** | M. Delgrego | | Wakeling | M. Delgrego | D. Henneberry | D. Henneberry |
| **Taxonomist** | C. Rosamond | C. Rosamond | C. Rosamond | C. Rosamond | C. Rosamond | C. Rosamond |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DWS03-048-49 | DRI05-065 | DRI05-279 | DRI04-052&053 | DRI05-064 | DRI05-276 |
|---|---|---|---|---|---|---|
| **Date Sampled** | 07/27/2004 | 07/23/2005 | 11/05/2005 | 07/28/2004 | 07/22/2005 | 11/05/2005 |
| **Spring Name** | Kalamazoo Sp. | Kalamazoo Sp. | Kalamazoo Sp. | Headwaters Sp. | Headwaters Sp. | Headwaters Sp. |
| **Sample Type** | Composite | Composite | Composite | Composite | Composite | Composite |
| **Location** | T20N-R66E-SW30 | T20N-R66E-SW30 | T20N-R66E-SW30 | T6N-R68E-SW23 | T6N-R68E-SW23 | T6N-R68E-SW23 |
| **Mountain Range** | Schell Creek | Schell Creek | Schell Creek | Wilson Creek | Wilson Creek | Wilson Creek |
| | | | | | | |
| **METRICS** | | | | | | |
| ***Diversity & Richness*** | | | | | | |
| Richness (distinct benthic taxa only) | 23 | 30 | 28 | 22 | 19 | 17 |
| ***Compositional*** | | | | | | |
| % EPT | 16.2 | 23.7 | 38.1 | 13.9 | 23.4 | 67.9 |
| % Ephemeroptera | 7.8 | 2.5 | 1.1 | 13.3 | 22.5 | 66.0 |
| % Plecoptera | 1.6 | 4.6 | 0.9 | 0.2 | 0.0 | 0.0 |
| % Trichoptera | 6.8 | 16.6 | 36.1 | 0.5 | 0.9 | 1.9 |
| ***HBI-related*** | | | | | | |
| Community Tolerance Value | 4.17 | 4.94 | 4.12 | 6.61 | 6.70 | 5.77 |
| % Sensitive EPT | 6.49 | 15.90 | 35.53 | 0.34 | 0.00 | 0.00 |
| % Insensitive EPT | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| % Sensitive (all organisms) | 6.49 | 15.90 | 35.53 | 0.34 | 0.00 | 0.00 |
| % Insensitive (all organisms) | 0.00 | 1.06 | 2.58 | 0.00 | 0.23 | 0.94 |
| ***Functional Feeding*** | | | | | | |
| % Shredders | 7.79 | 17.31 | 36.96 | 0.50 | 1.13 | 1.89 |
| % Scrapers | 0.00 | 0.00 | 0.57 | 0.00 | 0.00 | 0.00 |
| % Collector-Filterers | 7.14 | 8.48 | 3.15 | 25.67 | 4.28 | 3.14 |
| % Collector-Gatherers | 81.49 | 66.78 | 53.30 | 71.31 | 91.22 | 90.57 |
| % Predators | 3.25 | 3.53 | 3.44 | 2.52 | 0.45 | 1.57 |
| % Other | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Behavioural (Habit)** | | | | | | |
| % Swimmers | 57.79 | 24.38 | 7.16 | 14.09 | 22.75 | 66.04 |
| % Clingers | 25.97 | 19.08 | 33.52 | 21.98 | 4.50 | 2.20 |
| % Sprawlers | 7.14 | 38.87 | 27.51 | 15.27 | 6.76 | 8.49 |
| % Climbers | 6.17 | 7.42 | 21.78 | 5.87 | 11.49 | 2.20 |
| % Burrowers | 0.65 | 7.77 | 7.16 | 42.79 | 51.35 | 18.24 |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DRI04-054&055 | DRI05-062 | DRI05-278 | DRI05-277 |
|---|---|---|---|---|
| **Date Sampled** | 07/29/2004 | 07/21/2005 | 11/05/2005 | 11/04/2005 |
| **Spring Name** | Patterson Pass Sp. | Patterson Pass Sp. | Patterson Pass Sp. | Grapevine Sp. |
| **Sample Type** | Composite | Composite | Composite | Composite |
| **Location** | T9N-R65E-NE31 | T9N-R65E-NE31 | T9N-R65E-NE31 | T9S-R65E-SE28 |
| **Mountain Range** | Schell Creek | Schell Creek | Schell Creek | Meadow Valley |
| **Phylum Arthropoda** | | | | |
| **Class Insecta** | | | | |
| **Ephemeroptera** | | | | |
| **Ameletidae** | | | | |
| *Ameletus* | | | | |
| **Baetidae** | | | | |
| *Baetis* | 54 | | | |
| *Diphetor hageni* | | | | |
| *Fallceon quilleri* | | | | |
| *Magnus* | | 4 | 2 | |
| *Baetis (tricaudatus)* | | | | |
| *Baetis (bicaudatus)* | | | | |
| **Heptageniidae** | | | | |
| *Cinygmula* | | | | |
| **Leptophlebiidae** | | | | |
| **Plecoptera** | | | | |
| **Chloroperlidae** | | | | |
| *Sweltsa* | | | | |
| **Nemouridae** | | | | |
| *Malenka* | | | | |
| *Zapada* | | | | |
| *Z. cinctipes* | | | | |
| **Perlidae** | | | | |
| *Hesperoperla* | | | | |
| **Perlodidae** | | | | |
| *Isoperla* | | | | |
| **Pteronarcyidae** | | | | |
| *Pteronarcella* | | | | |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DRI04-054&055 | DRI05-062 | DRI05-278 | DRI05-277 |
|---|---|---|---|---|
| **Date Sampled** | 07/29/2004 | 07/21/2005 | 11/05/2005 | 11/04/2005 |
| **Spring Name** | Patterson Pass Sp. | Patterson Pass Sp. | Patterson Pass Sp. | Grapevine Sp. |
| **Sample Type** | Composite | Composite | Composite | Composite |
| **Location** | T9N-R65E-NE31 | T9N-R65E-NE31 | T9N-R65E-NE31 | T9S-R65E-SE28 |
| **Mountain Range** | Schell Creek | Schell Creek | Schell Creek | Meadow Valley |
| **Trichoptera** | | | | |
| **Brachycentridae** | | | | |
| *Brachycentrus* | | | | |
| *Micrasema* | | | | |
| **Hydropsychidae** | | | | |
| *Ceratopsyche* | | | | |
| *Cheumatopsyche* | | | | |
| **Hydroptilidae** | | | | |
| *Ochrotrichia* | 62 | 4 | 3 | |
| **Lepidostomatidae** | | | | |
| *Lepidostoma* | | | | |
| **Leptoceridae** | | | | |
| **Limnephillidae** | | 1 | 1 | |
| *Eocosmoecus* | 1 | | | |
| *Hesperophylax* | | | | |
| *Limnephilus* | | | | |
| **Odontoceridae** | | | | |
| *Marilia* | | | | |
| **Philopotamidae** | | | | |
| *Wormaldia* | | | | |
| **Rhyacophilidae** | | | | |
| *Rhyacophila* | | | | |
| *R. acropedes Gr (= brunnea-vemna)* | | | | |
| *R. vofixa Gr* | | | | |
| **Coleoptera** | | | | |
| **Dytiscidae** | | | | |
| *Agabus* | | | | |
| *Oreodytes,* larva | | | | |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DRI04-054&055 | DRI05-062 | DRI05-278 | DRI05-277 |
|---|---|---|---|---|
| **Date Sampled** | 07/29/2004 | 07/21/2005 | 11/05/2005 | 11/04/2005 |
| **Spring Name** | Patterson Pass Sp. | Patterson Pass Sp. | Patterson Pass Sp. | Grapevine Sp. |
| **Sample Type** | Composite | Composite | Composite | Composite |
| **Location** | T9N-R65E-NE31 | T9N-R65E-NE31 | T9N-R65E-NE31 | T9S-R65E-SE28 |
| **Mountain Range** | Schell Creek | Schell Creek | Schell Creek | Meadow Valley |
| **Elmidae** | | | | |
| *Cleptelmis* | | | | |
| *Heterlimnius* | | | | |
| **Microsporidae** | 1 | | | |
| **Diptera** | | | | |
| **Ceratopogonidae** | | | | |
| *Atrichopogon* | | | | |
| *Bezzia/ Palpomyia* | 6 | 2 | 3 | |
| *Culicoides* | | | 18 | |
| *Probezzia* | | | | |
| **Chironomidae** | | | | |
| Chironominae | | | | |
| Chironomini | | | | |
| *Apedilum* | | 1 | | |
| *Paratendipes* | | | | |
| *Polypedilum* | | | | |
| *Polypedilum sf simulans-digitifer* | | | | |
| *Tribelos* | | | | |
| Diamesinae | | | | |
| *Diamesa* | | | | |
| *Pagastia* | | | | |
| *Pseudodiamesa* | | | | |
| Orthocladiinae | | | | 1 |
| *Brillia* | | 2 | | |
| *Corynoneura* | 6 | | | |
| *Chaetocladius* | 14 | 7 | 1 | |
| *Cricotopus (cf Bicinctus Gr)* | | | | |
| *Cricotopus/Orthocladius* | 2 | 1 | | 2 |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DRI04-054&055 | DRI05-062 | DRI05-278 | DRI05-277 |
|---|---|---|---|---|
| **Date Sampled** | 07/29/2004 | 07/21/2005 | 11/05/2005 | 11/04/2005 |
| **Spring Name** | Patterson Pass Sp. | Patterson Pass Sp. | Patterson Pass Sp. | Grapevine Sp. |
| **Sample Type** | Composite | Composite | Composite | Composite |
| **Location** | T9N-R65E-NE31 | T9N-R65E-NE31 | T9N-R65E-NE31 | T9S-R65E-SE28 |
| **Mountain Range** | Schell Creek | Schell Creek | Schell Creek | Meadow Valley |
| *Eukieffriella* | | | | |
| *Eukiefferiella (Brehmi Gr)* | | | | |
| *Eukiefferiella (Claripennis Gr)* | | | | |
| *Eukiefferiella (Devonica Gr)* | | | | |
| *Eukiefferiella (Gracei Gr)* | | | | |
| *Eukiefferiella (Rectangularis Gr)* | | | | |
| *Limnophyes* | | | 1 | 3 |
| *Paramtriocnemus/Paraphaenocladius* | | 13 | 8 | 3 |
| *Rheocricotopus* | | 18 | | |
| *Rheosmittia* | | | | 1 |
| *Theinemanniella* | | | | |
| *Tvtenia* | 95 | 140 | 34 | |
| *Tvtenia (bavarica Gr)* | | | | |
| Podonominae | | | | |
| *Boreochlus* | | | | |
| Tanypodinae | 5 | | | |
| *Apsectrotanypus* | | | | |
| *Nilotanypus* | | | 1 | |
| *Paramerina* | | | | |
| *Radotanypus* | | | | |
| *Thienemamannimyia* Gr | | | 2 | 5 |
| Tanytarsini | | | | |
| *Micropsectra* | | | | |
| *Paratanytarsus* | 2 | | | 14 |
| *Tanytarsus* | 60 | 7 | 24 | 10 |
| *Rheotanytarsus* | | 1 | | |
| **Culicidae** | | | | |
| *Anopheles* | | | | |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DRI04-054&055 | DRI05-062 | DRI05-278 | DRI05-277 |
|---|---|---|---|---|
| **Date Sampled** | 07/29/2004 | 07/21/2005 | 11/05/2005 | 11/04/2005 |
| **Spring Name** | Patterson Pass Sp. | Patterson Pass Sp. | Patterson Pass Sp. | Grapevine Sp. |
| **Sample Type** | Composite | Composite | Composite | Composite |
| **Location** | T9N-R65E-NE31 | T9N-R65E-NE31 | T9N-R65E-NE31 | T9S-R65E-SE28 |
| **Mountain Range** | Schell Creek | Schell Creek | Schell Creek | Meadow Valley |
| **Dixidae** | | | | |
| *Dixa* | 1 | | 1 | |
| *Dixella* | | | | |
| *Chelifera* | | | | |
| **Ephydridae** | 1 | | | |
| *Hydrellia* | | | | |
| *Scatella* | | | | |
| **Muscidae** | | | | |
| **Psychodidae** | | | | |
| *Psychoda* | | | | |
| *Pericoma/ Telmatoscopus* | | | | 3 |
| **Simuliidae** | | | | |
| *Simulium* | 37 | 3 | 1 | 2 |
| **Stratiomyidae** | | | | |
| *Caloparyphus* | | | | 2 |
| *Euparyphus* | | | | |
| *Stratiomys* | | | | |
| **Thaumaleidae** | | | | |
| *Thaumalea* | | 1 | | 1 |
| **Tipulidae** | | | | |
| *Dicranota* | | | | |
| *Hexatoma* | | | | |
| *Holorusia* | | | | |
| *Pedicia* | | | 1 | |
| **Odonata** | | | | |
| **Coenagrionidae** | | | | 84 |
| *Argia* | 10 | | 5 | |
| *Argia plana* | | 1 | | |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DRI04-054&055 | DRI05-062 | DRI05-278 | DRI05-277 |
|---|---|---|---|---|
| **Date Sampled** | 07/29/2004 | 07/21/2005 | 11/05/2005 | 11/04/2005 |
| **Spring Name** | Patterson Pass Sp. | Patterson Pass Sp. | Patterson Pass Sp. | Grapevine Sp. |
| **Sample Type** | Composite | Composite | Composite | Composite |
| **Location** | T9N-R65E-NE31 | T9N-R65E-NE31 | T9N-R65E-NE31 | T9S-R65E-SE28 |
| **Mountain Range** | Schell Creek | Schell Creek | Schell Creek | Meadow Valley |
| **Gomphidae** | | | | |
| *Stylurus* | | | | |
| *Lestes* | | | | |
| **Hemiptera** | | | | |
| **Naucoridae** | | | | |
| *Ambrysus* | | | | |
| **Mites** | | | | |
| **Acari (distinct)** | | | | |
| **Arrinuridae** | | | | |
| *Arrenurus* | | | | |
| **Aturidae** | | | | |
| *Aturus* | | | | |
| **Hydrodromidae** | | | | |
| *Hydrodroma* | | | | |
| **Hydrovilziidae** | | | | |
| *Hydrovolzia* | | | | |
| *Partnunia* | | | | |
| **Hygrobatidae** | | | | |
| *Atractides* | | | | |
| *Corticacarus* | | | | |
| **Lebertiidae** | | | | |
| *Lebertia* | | | | |
| **Limnesiidae** | | | | |
| *Neotyrellia* | 1 | | | |
| **Oribatei (**genus key unavailable for northern hemisphere) | 12 | 1 | 5 | |
| **Sperchontidae** | | | | |
| *Sperchon* | | | 1 | |
| **Stygothrombidiidae** | | | | |
| *Thyadinae* | | | | |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DRI04-054&055 | DRI05-062 | DRI05-278 | DRI05-277 |
|---|---|---|---|---|
| **Date Sampled** | 07/29/2004 | 07/21/2005 | 11/05/2005 | 11/04/2005 |
| **Spring Name** | Patterson Pass Sp. | Patterson Pass Sp. | Patterson Pass Sp. | Grapevine Sp. |
| **Sample Type** | Composite | Composite | Composite | Composite |
| **Location** | T9N-R65E-NE31 | T9N-R65E-NE31 | T9N-R65E-NE31 | T9S-R65E-SE28 |
| **Mountain Range** | Schell Creek | Schell Creek | Schell Creek | Meadow Valley |
| **Torrenticolidae** | | | | |
| *Torrenticola* | | | | |
| undetermined mite (distinct) | | | | |
| **Subphylum Crustacea** | | | | |
| **Class Ostracoda** | 2 | | | |
| **Candonidae** | | | | |
| **Cypridinae** | | | | 202 |
| **Cypridosidae** | | | | |
| **Ilyocyprididae** | | | | |
| **Amphipoda** | | | | |
| *Hyalella* | | | | |
| **Phylum Mollusca** | | | | |
| **Class Gastropoda** | | | | |
| **Lymnaeidae** | | | | |
| *Fossaria* | | | | |
| **Physidae** | | | | |
| *Physa/Physella* | | | | |
| **Class Bivalvia** | | | | |
| **Pelycepoda** | | | | |
| **Sphaeriidae** | | | | |
| *Pisidium* | 83 | 135 | 125 | |
| **Phylum Platyhelmenthes** | | | | |
| **Class Turbellaria** | | | | |
| **Tricladida** | | | | |
| **Planariidae** | 2 | | | |
| **Phylum Nematoda** | 9 | | 1 | 25 |
| **Phylum Annelida** | | | | |
| **Class Oligochaeta** | | | | |
| **Lumbriculidae** | | | | |
| **Enchytraeidae** | 30 | | 9 | 6 |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DRI04-054&055 | DRI05-062 | DRI05-278 | DRI05-277 |
|---|---|---|---|---|
| **Date Sampled** | 07/29/2004 | 07/21/2005 | 11/05/2005 | 11/04/2005 |
| **Spring Name** | Patterson Pass Sp. | Patterson Pass Sp. | Patterson Pass Sp. | Grapevine Sp. |
| **Sample Type** | Composite | Composite | Composite | Composite |
| **Location** | T9N-R65E-NE31 | T9N-R65E-NE31 | T9N-R65E-NE31 | T9S-R65E-SE28 |
| **Mountain Range** | Schell Creek | Schell Creek | Schell Creek | Meadow Valley |
| **Naididae** | 33 | | | |
| *Pristina* | | | | 1 |
| *Pristinella* | | | 1 | |
| *Nais* | | | | |
| **Tubificidae** | | | | |
| **Megadrili** | 6 | | | |
| **Orthocladiinae ND** | 32 | 24 | | |
| **Orthocladius ND** | | | | |
| ***Eukieffriella* ND** | | | | |
| **Baetidae ND** | | | 3 | |
| ***Baetis* ND** | | | | |
| **Limnephilidae ND** | | | | |
| **Elmidae (Not Distinct)** | | | | |
| **Brachycerous Dipteran pupa ND** | | | | |
| **Zygoptera ND** | 1 | | | |
| | | | | |
| **TOTAL Benthic Organisms** | 568 | 366 | 251 | 365 |
| **Total Distinct Benthic Organisms** | 535 | 342 | 248 | 365 |
| **Sample Sorter** | M. Delgrego | D. Henneberry | D. Henneberry | D. Henneberry |
| **Taxonomist** | C. Rosamond | C. Rosamond | C. Rosamond | C. Rosamond |

Table D-1. The number and identity of aquatic macroinvertebrates collected from springs in the White River system, 2003, 2004, and 2005 (continued).

| **Sample #** | DRI04-054&055 | DRI05-062 | DRI05-278 | DRI05-277 |
|---|---|---|---|---|
| **Date Sampled** | 07/29/2004 | 07/21/2005 | 11/05/2005 | 11/04/2005 |
| **Spring Name** | Patterson Pass Sp. | Patterson Pass Sp. | Patterson Pass Sp. | Grapevine Sp. |
| **Sample Type** | Composite | Composite | Composite | Composite |
| **Location** | T9N-R65E-NE31 | T9N-R65E-NE31 | T9N-R65E-NE31 | T9S-R65E-SE28 |
| **Mountain Range** | Schell Creek | Schell Creek | Schell Creek | Meadow Valley |
| **METRICS** | | | | |
| ***Diversity & Richness*** | | | | |
| Richness (distinct benthic taxa only) | 25 | 18 | 22 | 17 |
| ***Compositional metrics*** | | | | |
| % EPT | 20.6 | 2.5 | 2.4 | 0.0 |
| % Ephemeroptera | 9.5 | 1.1 | 0.8 | 0.0 |
| % Plecoptera | 0.0 | 0.0 | 0.0 | 0.0 |
| % Trichoptera | 11.1 | 1.4 | 1.6 | 0.0 |
| ***HBI-related*** | | | | |
| Community Tolerance Value | 6.01 | 6.17 | 6.84 | 7.78 |
| % Sensitive EPT | 0.00 | 0.00 | 0.00 | 0.00 |
| % Insensitive EPT | 0.00 | 0.00 | 0.00 | 0.00 |
| % Sensitive (all organisms) | 0.00 | 0.00 | 0.00 | 0.00 |
| % Insensitive (all organisms) | 5.28 | 0.00 | 3.59 | 24.66 |
| ***Functional Feeding*** | | | | |
| % Shredders | 0.18 | 0.82 | 0.40 | 0.00 |
| % Scrapers | 0.00 | 0.27 | 0.00 | 0.27 |
| % Collector-Filterers | 31.69 | 39.89 | 59.76 | 3.29 |
| % Collector-Gatherers | 61.27 | 57.92 | 23.90 | 70.96 |
| % Predators | 6.34 | 1.09 | 14.34 | 24.38 |
| Other | 0.00 | 0.00 | 0.00 | 0.00 |
| **Behavioural (Habit)** | | | | |
| % Swimmers | 9.68 | 1.09 | 1.20 | 0.00 |
| % Clingers | 21.83 | 3.01 | 5.98 | 0.82 |
| % Sprawlers | 33.27 | 83.88 | 67.73 | 61.37 |
| % Climbers | 10.56 | 1.91 | 9.56 | 25.75 |
| % Burrowers | 24.30 | 10.11 | 14.34 | 12.05 |

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## APPENDIX E. Rating Curves for WR-1 and WR-6.

**WR-1 6/3/2005**

| Section Width (ft) | Depth (ft) | Velocity (ft/s) | Discharge ($ft^3/s$) |
|---|---|---|---|
| 0.33 | 0.2 | 0.56 | 0.04 |
| 0.33 | 0.7 | 1.19 | 0.28 |
| 0.33 | 0.9 | 1.49 | 0.45 |
| 0.33 | 1.1 | 2.9 | 1.06 |
| 0.33 | 1.15 | 3.78 | 1.45 |
| 0.33 | 1.2 | 3.59 | 1.44 |
| 0.33 | 0.8 | 3.61 | 0.96 |
| 0.33 | 0.7 | 3.99 | 0.93 |
| 0.33 | 0.75 | 4.45 | 1.11 |
| 0.33 | 0.6 | 4.29 | 0.86 |
| 0.33 | 0.65 | 3.27 | 0.71 |
| 0.33 | 0.65 | 3.33 | 0.72 |
| 0.33 | 0.7 | 2.94 | 0.69 |
| 0.33 | 0.7 | 3.5 | 0.82 |
| 0.33 | 0.6 | 2.26 | 0.45 |
| Total Discharge | | | 11.96 |
| Stage Reading | | | 0.83 |

**WR-1 6/9/2005**

| Section Width (ft) | Depth (ft) | Velocity (ft/s) | Discharge ($ft^3/s$) |
|---|---|---|---|
| 0.33 | 0.45 | 0.49 | 0.07 |
| 0.33 | 0.60 | 1.87 | 0.37 |
| 0.33 | 0.75 | 2.41 | 0.60 |
| 0.33 | 0.85 | 2.90 | 0.82 |
| 0.33 | 0.90 | 3.23 | 0.97 |
| 0.33 | 1.00 | 3.49 | 1.16 |
| 0.33 | 0.90 | 2.84 | 0.85 |
| 0.33 | 0.70 | 2.69 | 0.63 |
| 0.33 | 0.70 | 2.65 | 0.62 |
| 0.33 | 0.65 | 2.60 | 0.56 |
| 0.33 | 0.65 | 2.56 | 0.55 |
| 0.33 | 0.55 | 2.42 | 0.44 |
| 0.33 | 0.50 | 1.62 | 0.27 |
| 0.33 | 0.45 | 0.45 | 0.07 |
| 0.33 | 0.35 | 0.19 | 0.02 |
| Total Discharge | | | 8.02 |
| Stage Reading | | | 0.67 |

**WR-1 6/28/2005**

| Section Width (ft) | Depth (ft) | Velocity (ft/s) | Discharge ($ft^3/s$) |
|---|---|---|---|
| 0.33 | 0.45 | 0.18 | 0.03 |
| 0.33 | 0.55 | 1.83 | 0.34 |
| 0.33 | 0.70 | 2.44 | 0.57 |
| 0.33 | 0.85 | 2.92 | 0.83 |
| 0.33 | 0.95 | 3.23 | 1.02 |
| 0.33 | 0.85 | 3.41 | 0.97 |
| 0.33 | 0.80 | 2.88 | 0.77 |
| 0.33 | 0.75 | 3.02 | 0.76 |
| 0.33 | 0.65 | 3.04 | 0.66 |
| 0.33 | 0.50 | 2.76 | 0.46 |
| 0.33 | 0.55 | 2.39 | 0.44 |
| 0.33 | 0.55 | 1.57 | 0.29 |
| 0.33 | 0.50 | 0.88 | 0.15 |
| 0.33 | 0.30 | 0.54 | 0.05 |
| Total Discharge | | | 7.32 |
| Stage Reading | | | 0.64 |

**WR-1 7/3/2005**

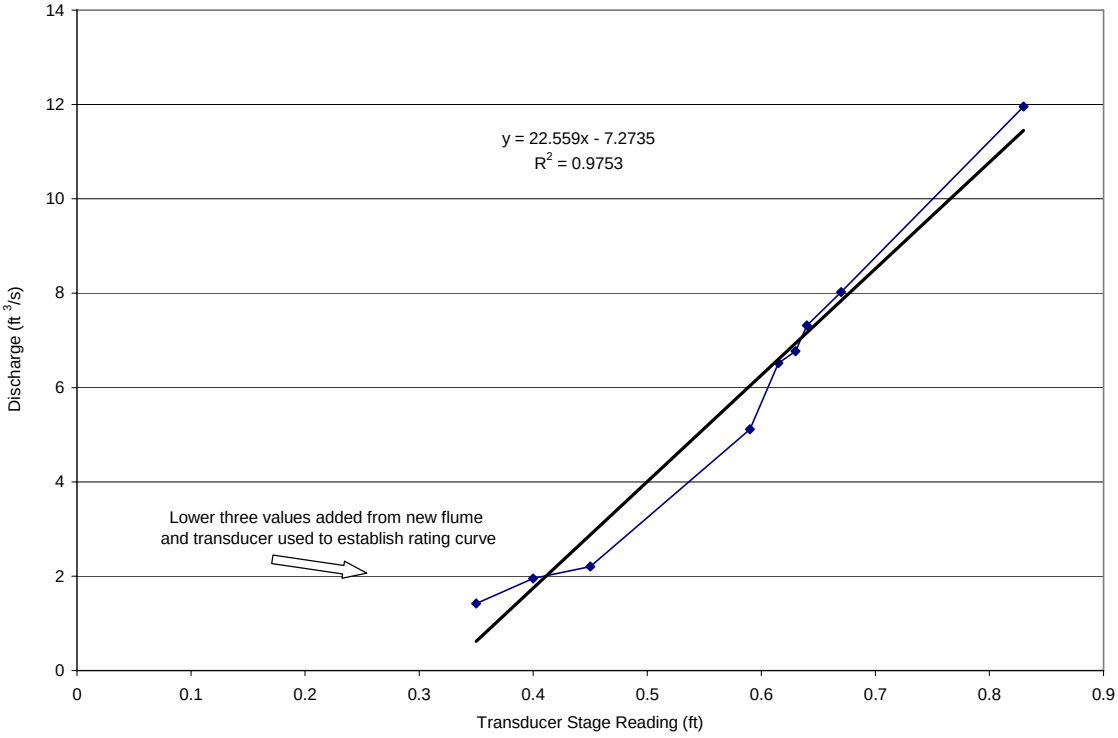
| Section Width (ft) | Depth (ft) | Velocity (ft/s) | Discharge ($ft^3/s$) |
|---|---|---|---|
| 0.33 | 0.30 | 0.50 | 0.05 |
| 0.33 | 0.60 | 0.91 | 0.18 |
| 0.33 | 0.75 | 1.58 | 0.40 |
| 0.33 | 0.95 | 2.24 | 0.71 |
| 0.33 | 0.95 | 2.77 | 0.88 |
| 0.33 | 0.95 | 2.96 | 0.94 |
| 0.33 | 0.90 | 2.64 | 0.79 |
| 0.33 | 0.80 | 2.64 | 0.70 |
| 0.33 | 0.70 | 2.49 | 0.58 |
| 0.33 | 0.60 | 2.26 | 0.45 |
| 0.33 | 0.60 | 2.20 | 0.44 |
| 0.33 | 0.55 | 2.20 | 0.40 |
| 0.33 | 0.50 | 1.11 | 0.19 |
| 0.33 | 0.34 | 0.55 | 0.06 |
| Total Discharge | | | 6.77 |
| Stage Reading | | | 0.63 |

**WR-1 7/17/2005**

| Section Width (ft) | Depth (ft) | Velocity (ft/s) | Discharge ($ft^3/s$) |
|---|---|---|---|
| 0.33 | 0.35 | 0.38 | 0.04 |
| 0.33 | 0.60 | 0.94 | 0.19 |
| 0.33 | 0.75 | 2.25 | 0.56 |
| 0.33 | 0.95 | 3.03 | 0.96 |
| 0.33 | 0.95 | 3.07 | 0.97 |
| 0.33 | 0.80 | 2.15 | 0.57 |
| 0.33 | 0.75 | 2.76 | 0.69 |
| 0.33 | 0.70 | 3.06 | 0.71 |
| 0.33 | 0.65 | 2.72 | 0.59 |
| 0.33 | 0.50 | 2.44 | 0.41 |
| 0.33 | 0.60 | 1.91 | 0.38 |
| 0.33 | 0.45 | 1.85 | 0.28 |
| 0.33 | 0.45 | 0.77 | 0.12 |
| 0.17 | 0.40 | 0.65 | 0.04 |
| Total Discharge | | | 6.52 |
| Stage Reading | | | 0.62 |

**WR-1 8/14/2005**

| Section Width (ft) | Depth (ft) | Velocity (ft/s) | Discharge ($ft^3/s$) |
|---|---|---|---|
| 0.33 | 0.45 | 0.04 | 0.01 |
| 0.33 | 0.50 | 0.90 | 0.15 |
| 0.33 | 0.70 | 1.58 | 0.37 |
| 0.33 | 0.80 | 2.47 | 0.66 |
| 0.33 | 0.85 | 3.00 | 0.85 |
| 0.33 | 0.80 | 2.40 | 0.64 |
| 0.33 | 0.75 | 2.23 | 0.56 |
| 0.33 | 0.65 | 2.63 | 0.57 |
| 0.33 | 0.60 | 2.54 | 0.51 |
| 0.33 | 0.45 | 1.61 | 0.24 |
| 0.33 | 0.45 | 1.72 | 0.26 |
| 0.33 | 0.45 | 1.45 | 0.22 |
| 0.33 | 0.45 | 0.32 | 0.05 |
| 0.33 | 0.30 | 0.42 | 0.04 |
| Total Discharge | | | 5.12 |
| Stage Reading | | | 0.59 |


y = 22.559x - 7.2735
R2 = 0.9753
Lower three values added from new flume
and transducer used to establish rating curve
Discharge (ft 3/s)
Transducer Stage Reading (ft)
0
2
4
6
8
10
12
14
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9

**WR-6 6/4/2005**

| Section Width (ft) | Depth (ft) | Velocity (ft/s) | Discharge ($ft^3/s$) |
|---|---|---|---|
| 0.33 | 0.55 | 0.04 | 0.01 |
| 0.33 | 0.75 | 0.21 | 0.05 |
| 0.33 | 0.85 | 0.20 | 0.06 |
| 0.33 | 1.10 | 1.82 | 0.67 |
| 0.33 | 1.30 | 3.20 | 1.39 |
| 0.33 | 1.30 | 4.30 | 1.86 |
| 0.33 | 1.25 | 4.52 | 1.88 |
| 0.33 | 1.35 | 4.79 | 2.16 |
| 0.33 | 1.20 | 4.45 | 1.78 |
| 0.33 | 1.15 | 4.00 | 1.53 |
| 0.33 | 0.33 | 3.00 | 0.33 |
| 0.33 | 1.15 | 3.17 | 1.22 |
| 0.33 | 1.10 | 2.58 | 0.95 |
| 0.33 | 1.05 | 2.37 | 0.83 |
| 0.33 | 1.05 | 2.26 | 0.79 |
| 0.33 | 1.00 | 1.33 | 0.44 |
| 0.33 | 0.95 | 0.66 | 0.21 |
| 0.33 | 0.90 | 0.60 | 0.18 |
| 0.33 | 0.80 | 0.49 | 0.13 |
| 0.33 | 0.70 | 0.12 | 0.03 |
| 0.33 | 0.20 | 0.04 | 0.00 |
| Total Discharge | | | 16.49 |
| Stage Reading | | | 2.20 |

**WR-6 6/9/2005**

| Section Width (ft) | Depth (ft) | Velocity (ft/s) | Discharge ($ft^3/s$) |
|---|---|---|---|
| 0.33 | 0.40 | 0.21 | 0.03 |
| 0.33 | 0.60 | 0.23 | 0.05 |
| 0.33 | 0.85 | 0.67 | 0.19 |
| 0.33 | 1.00 | 1.71 | 0.57 |
| 0.33 | 1.10 | 3.34 | 1.22 |
| 0.33 | 1.10 | 4.18 | 1.53 |
| 0.33 | 1.05 | 4.60 | 1.61 |
| 0.33 | 1.05 | 4.53 | 1.59 |
| 0.33 | 1.05 | 4.28 | 1.50 |
| 0.33 | 1.20 | 3.77 | 1.51 |
| 0.33 | 1.05 | 3.62 | 1.27 |
| 0.33 | 1.00 | 3.24 | 1.08 |
| 0.33 | 0.95 | 2.92 | 0.92 |
| 0.33 | 0.95 | 2.69 | 0.85 |
| 0.33 | 0.95 | 2.05 | 0.65 |
| 0.33 | 0.85 | 0.97 | 0.27 |
| 0.33 | 0.80 | 0.65 | 0.17 |
| 0.33 | 0.75 | 0.52 | 0.13 |
| 0.33 | 0.70 | 0.39 | 0.09 |
| 0.33 | 0.60 | 0.05 | 0.01 |
| 0.33 | 0.10 | -0.10 | 0.00 |
| Total Discharge | | | 15.24 |
| Stage Reading | | | 2.05 |

**WR-6 6/27/2005**

| Section Width (ft) | Depth (ft) | Velocity (ft/s) | Discharge ($ft^3/s$) |
|---|---|---|---|
| 0.33 | 0.50 | -0.15 | -0.03 |
| 0.33 | 0.80 | 0.08 | 0.02 |
| 0.33 | 0.90 | 0.71 | 0.21 |
| 0.33 | 1.00 | 1.34 | 0.45 |
| 0.33 | 1.10 | 3.04 | 1.11 |
| 0.33 | 1.15 | 4.25 | 1.63 |
| 0.33 | 1.15 | 4.38 | 1.68 |
| 0.33 | 1.10 | 4.08 | 1.50 |
| 0.33 | 1.15 | 3.50 | 1.34 |
| 0.33 | 1.10 | 3.24 | 1.19 |
| 0.33 | 1.00 | 2.97 | 0.99 |
| 0.33 | 0.95 | 2.75 | 0.87 |
| 0.33 | 0.90 | 2.77 | 0.83 |
| 0.33 | 0.90 | 2.31 | 0.69 |
| 0.33 | 0.90 | 1.86 | 0.56 |
| 0.33 | 0.80 | 1.17 | 0.31 |
| 0.33 | 0.75 | 1.21 | 0.30 |
| 0.33 | 0.65 | 1.05 | 0.23 |
| 0.33 | 0.55 | 0.11 | 0.02 |
| 0.33 | 0.40 | -0.05 | -0.01 |
| Total Discharge | | | 13.90 |
| Stage Reading | | | 1.87 |

**WR-6 7/17/2005**

| Section Width (ft) | Depth (ft) | Velocity (ft/s) | Discharge ($ft^3/s$) |
|---|---|---|---|
| 0.33 | 0.10 | -0.10 | 0.00 |
| 0.33 | 0.45 | 0.10 | 0.02 |
| 0.33 | 0.55 | 0.95 | 0.17 |
| 0.33 | 0.70 | 1.76 | 0.41 |
| 0.33 | 0.80 | 2.45 | 0.65 |
| 0.33 | 0.80 | 3.09 | 0.82 |
| 0.33 | 0.90 | 3.55 | 1.07 |
| 0.33 | 0.90 | 3.94 | 1.18 |
| 0.33 | 0.85 | 4.10 | 1.16 |
| 0.33 | 0.85 | 3.57 | 1.01 |
| 0.33 | 0.80 | 2.82 | 0.75 |
| 0.33 | 0.70 | 2.76 | 0.64 |
| 0.33 | 0.60 | 2.48 | 0.50 |
| 0.33 | 0.60 | 1.82 | 0.36 |
| 0.33 | 0.60 | 1.36 | 0.27 |
| 0.33 | 0.60 | 1.09 | 0.22 |
| 0.33 | 0.50 | 1.33 | 0.22 |
| 0.33 | 0.40 | 0.87 | 0.12 |
| 0.33 | 0.35 | 0.07 | 0.01 |
| 0.33 | 0.20 | -0.20 | -0.01 |
| Total Discharge | | | 9.57 |
| Stage Reading | | | 1.57 |

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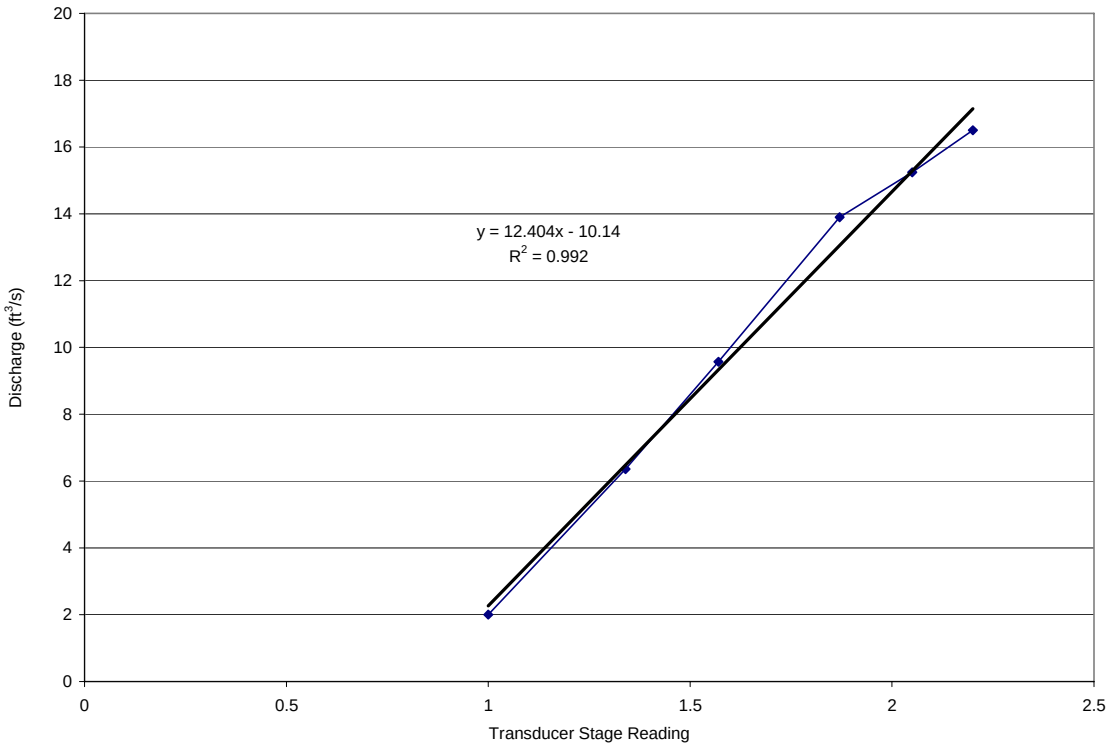
| Section Width (ft) | Depth (ft) | Velocity (ft/s) | Discharge ($ft^3/s$) |
|---|---|---|---|
| 0.33 | 0.30 | 0.20 | 0.02 |
| 0.33 | 0.40 | 0.10 | 0.01 |
| 0.33 | 0.45 | 1.01 | 0.15 |
| 0.33 | 0.60 | 2.28 | 0.46 |
| 0.33 | 0.70 | 2.92 | 0.68 |
| 0.33 | 0.75 | 2.87 | 0.72 |
| 0.33 | 0.75 | 3.58 | 0.90 |
| 0.33 | 0.70 | 4.02 | 0.94 |
| 0.33 | 0.70 | 3.13 | 0.73 |
| 0.33 | 0.60 | 2.74 | 0.55 |
| 0.33 | 0.55 | 2.37 | 0.43 |
| 0.33 | 0.50 | 1.88 | 0.31 |
| 0.33 | 0.40 | 1.53 | 0.20 |
| 0.33 | 0.40 | 0.60 | 0.08 |
| 0.33 | 0.45 | 0.45 | 0.07 |
| 0.33 | 0.30 | 0.30 | 0.03 |
| 0.33 | 0.30 | 0.30 | 0.03 |
| 0.33 | 0.35 | 0.35 | 0.04 |
| 0.33 | 0.20 | 0.20 | 0.01 |
| Total Discharge | | | 6.36 |
| Stage Reading | | | 1.34 |



**APPENDIX F. Methods Summary for Accredited Testing.**

**Water Analysis Laboratory**
**Desert Research Institute**

| Analyte | Method-EPA | Method-SM | Description |
|---|---|---|---|
| Nitrate | | SM 4500-NO3 F | Colorimetric, Automated, Cadmium Reduction |
| pH | | SM 4500 H+ B | Electrometric |
| Alkalinity | | USGS I 1030-85 | Electrometric Titration |
| Conductivity | | SM 2510 B | Specific Conductance |
| Chloride | EPA 300.0 | | Ion Chromatography |
| Sulfate | EPA 300.0 | | Ion Chromatography |
| Bromide | EPA 300.0 | | Ion Chromatography |
| Fluoride | | SM 4500 F-C | Electrometric |
| Sodium | | SM 3111B | Atomic Absorption |
| Potassium | | SM 3111B | Atomic Absorption |
| Calcium | | SM 3111B | Atomic Absorption |
| Magnesium | | SM 3111B | Atomic Absorption |
| Silica | EPA 370.1 | | Colorimetric |
| Total Organic Carbon | | SM 5310C | Persulfate Digestion, IR Spec |

Reference:


1. *Methods for the Determination of Inorganic Substances in Environmental Samples,* EPA/600/R-93/100,August 1993, United States Environmental Protection Agency, Office of Research and Development, Washington DC 20460
2. *Methods for Chemical Analysis of Water and Wastes*, EPA-600/4-79-020 March 1979, Environmental Monitoring and Support Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Cincinnati, Ohio 45468
3. *Standard Methods For The Examination Of Water and Wastewater,* 18 Th. Edition, 1992, Editors Arnold E. Greenberg, Lenore S. Clesceri, Andrew D. Eaton, Mary Ann H. Franson, American Public Health Association, 1015 Fifteenth Street NW, Washington, DC 20005
4. *United States Geological Survey, Methods for the Determination of Inorganic Substances in Water and Fluvial Sediments,"* Book 5, Chapter A1, 1985, Editors: Marvin W. Skougstad, Marvin J. Fishmann. Linda C. Friedman, David E. Erdmann, and Saundra S. Duncan, U.S. Government Printing Office, Washington D.C. 20402

## APPENDIX G. Methods for Determining the Stable Isotopic Composition of Water.

Water-δD analyses are performed using the method of Morrison et al. (2001). δD results are reported in units of ‰ vs. VSMOW. An uncertainty of ±1‰ (1 standard deviation) is recommended. Water-$\delta^{18}O$ analyses are performed using the $CO_2$ - $H_2O$ equilibration method of Epstein and Mayeda (1953). $\delta^{18}O$ results are reported in units of ‰ vs. VSMOW. An uncertainty of ±0.1‰ (1 standard deviation) is recommended.

Analytical results are calibrated using 3 internal isotope standards, which are used during each analytical run. These internal isotope standards have been calibrated vs. isotope standards available from NIST, and are periodically checked to verify their isotopic integrity.

A minimum of 15% of the samples in each analytical run are analyzed in duplicate. If the reproducibility of these duplicate analyses does not meet the recommended reporting uncertainty (i.e. a standard deviation of ±1‰ for δD, and of ±0.1‰ for $\delta^{18}O$), then the results of the analytical run are discarded, and the samples are re-analyzed.

### References


Epstein, S. and Mayeda, T. (1953). Variation of $O^{18}$ content of waters from natural sources. *Geochimica et Cosmochimica Acta*, 4: 213-224.

Morrison, J., Brockwell, T., Merren, T., Fourel, F. and Phillips, A.M. (2001). On-line high-precision stable hydrogen isotopic analyses on nanoliter water samples. *Analytical Chemistry*, 73: 3570-3575.