<u>Stream</u>: Animas River (Upper Segment)

Executive Summary

Water Division: 7
Water District: 30
CDOW#: 38011
CWCB ID: 10/1/A-001

<u>Segment</u>: Confluence with Minnie Gulch to Confluence with Cunningham Creek

Upper Terminus: CONFLUENCE WITH MINNIE GULCH
(Latitude 37° 51’ 44.73”N) (Longitude 107° 34’ 22.68”W)

Lower Terminus: CONFLUENCE WITH CUNNINGHAM CREEK
(Latitude 37° 50’ 11.15”N) (Longitude 107° 35’ 51.91”W)

Watershed: Animas (HUC#: 14080104**)**
Counties: San Juan
Length: 2.58 miles
USGS Quad(s): Howardsville
Flow Recommendation: 12.2 cfs (May 1 – October 31)
9.1 cfs (November 1 – April 30)

Staff Analysis and Recommendation

Summary

The information contained in this report and the associated instream flow file folder forms the basis for staff's instream flow recommendation to be considered by the Board. It is staff's opinion that the information contained in this report is sufficient to support the findings required in Rule 5.40.

Colorado's Instream Flow Program was created in 1973 when the Colorado State Legislature recognized "the need to correlate the activities of mankind with some reasonable preservation of the natural environment" (see 37-92-102 (3) C.R.S.). The statute vests the CWCB with the exclusive authority to appropriate and acquire instream flow and natural lake level water rights. In order to encourage other entities to participate in Colorado's Instream Flow Program, the statute directs the CWCB to request instream flow recommendations from other state and federal agencies. The Bureau of Land Management (BLM) recommended this segment of the Animas River to the CWCB for inclusion into the Instream Flow Program. The Animas River is being considered for inclusion into the Instream Flow Program because it has a natural environment that can be preserved to a reasonable degree with an instream flow water right.

The Animas River travels approximately 84.3 miles in Colorado. It begins on the east side of Houghton Mountain at an elevation of approximately 12,000 feet and crosses the Colorado-New Mexico Stateline at an elevation of approximately 5,930 feet. Of the 2.58 mile segment addressed by this report, approximately 25% of the segment is located on public lands. This segment of the Animas River is located within San Juan County and generally flows in a southwesterly direction.

The subject of this report is a segment of the Animas River beginning at the confluence of Minnie Gulch and extending downstream to the confluence with Cunningham Creek. The proposed segment is located about 1.5 miles northeast of Silverton. Staff has received only one recommendation for this segment, from the BLM. The recommendation for this segment is discussed below.

Instream Flow Recommendation

The BLM is recommending 12.2 cfs (May 1 – October 31) and 9.1 cfs (November 1 – April 30) based on their data collection efforts and staff's water availability analyses.

Land Status Review

Upper Terminus	Lower Terminus	Total Length (miles)	Land Ownership	
			% Private	% Public
Confluence w/ Minnie Gulch	Confluence w/ Cunningham Creek	2.58	75%	25%

All of the public lands are managed by the BLM.

Biological Data

This segment of the Animas River is a moderate gradient stream with moderate to large substrate size, often punctuated by large boulders within the stream channel. Many portions of the stream channel have been affected by historic mining that moved bedload materials. Natural hydrologic processes since the mining activity ceased have created a natural stream channel, but some portions of the river are still highly braided and lack good width to depth ratios.

Water quality in the stream segment is affected by heavy metals from both natural sources and historic mining activities within the watershed. Minnie Gulch and Maggie Gulch contribute water to the river that has lower concentrations of heavy metals, so water quality improves as you move downstream through the reach.

Fish surveys have documented naturally reproducing populations of brook trout in this stream reach. Brook trout are the trout species that are most tolerant of heavy metal loads, but they indicate that the stream has sufficient macroinvertebrates to provide for fish forage, and that the stream has basic ecologic functions. Brook trout are not found immediately above this reache, indicating that heavy metal loads in that location are too high for fish habitat. The recommended reach provides an important connectivity between good fish habitat found in Minnie Gulch, Maggie Gulch, and Cunningham Creek. The CWCB has previously appropriated instream flow water rights on all three of these important tributaries, based upon recommendations from BLM and the Colorado Division of Wildlife.

The riparian community consists primarily of willows and potentilla. As you move downstream and the water quality improves, the riparian community is more vigorous and has succeeded in converting the stream from a braided system to a channelized environment that is more favorable to fish populations.

Field Survey Data

BLM staff used the R2Cross methodology to quantify the amount of water required to preserve the natural environment to a reasonable degree. The R2Cross method requires that stream discharge and channel profile data be collected in a riffle stream habitat type. Riffles are most easily visualized, as the stream habitat types that would dry up first should streamflow cease. This type of hydraulic data collection consists of setting up a transect, surveying the stream channel geometry, and measuring the stream discharge.

Biological Flow Recommendation

The CWCB staff relied upon the biological expertise of the cooperating agencies to interpret output from the R2Cross data collected to develop the initial, biologic instream flow recommendation. This initial recommendation is designed to address the unique biologic requirements of each stream without regard to water availability. Three instream flow hydraulic parameters, average depth, percent wetted perimeter, and average velocity are used to develop biologic instream flow recommendations. The CDOW has determined that maintaining these three hydraulic parameters at adequate levels across riffle habitat types, aquatic habitat in pools and runs will also be maintained for most life stages of fish and aquatic invertebrates (Nehring 1979; Espegren 1996).

For this segment of stream, three data sets were collected with the results shown in Table 1 below. Table 1 shows who collected the data (Party), the date the data was collected (Date), the measured discharge at the time of the survey (Q), the accuracy range of the predicted flows based on Manning's Equation (240% and 40% of Q), the summer flow recommendation based on meeting 3 of 3 hydraulic criteria and the winter flow recommendation based upon 2 of 3 hydraulic criteria. It is believed that recommendations that fall outside of the accuracy range of the model, over 250% of the measured discharge or under 40% of the measured discharge may not give an accurate estimate of the necessary instream flow required.

Table 1: Data

Party	Date	Q	250%-40%	Summer (3/3)	Winter (2/3)
BLM	7/28/2004	37.55	93.9 – 15.0	15.62	Out of range
BLM	10/20/2004	18.10	45.3 – 7.2	Out of range	11.37
BLM	10/20/2004	13.81	34.5 – 5.5	8.80	6.80

The summer flow recommendation, which met 3 of 3 criteria and is within the accuracy range of the R2CROSS model is 12.2 cfs. The winter flow amount, which meets 2 of 3 criteria, is 9.1 cfs. The summer and winter flow recommendations were derived by averaging the results of the data sets.

Hydrologic Data and Analysis

After receiving the cooperating agency's biologic recommendation, the CWCB staff conducted an evaluation of the stream hydrology to determine if water was physically available for an instream flow appropriation. This evaluation was done through a computation that is, in essence, a "water balance". In concept a "water balance" computation can be viewed as an accounting exercise. When done in its most rigorous form, the water balance parses precipitation into all the avenues water pursues after it is deposited as rain, snow, or ice. In other words, given a specified amount of water deposition (input), the balance tries to account for all water depletions (losses) until a selected end point is reached. Water losses include depletions due to evaporation and transpiration, deliveries into ground water storage, temporary surface storage, incorporations into plant and animal tissue and so forth. These losses are individually or collectively subtracted from the input to reveal the net amount of stream runoff as represented by the discharge measured by stream gages. Of course, the measured stream flow need not be the end point of interest; indeed, when looking at issues of water use to extinction stream flow measurements may only describe intermediate steps in the complex accounting process that is a water balance carried out to a net value of zero.

In its analysis, CWCB staff has attempted to use this idea of balancing inputs and losses to determine if water is available for the recommended Instream Flow Appropriation. Of course, this analysis must be a practical exercise rather than a lengthy, and costly, scientific investigation. As a result, staff has simplified the process by lumping together some variables and employing certain rational and scientifically supportable assumptions. The process may be described through the following description of the steps used to complete the evaluation for this particular stream.

The first step required in determining water availability is a determination of the hydrologic regime at the Lower Terminus (LT) of the recommended ISF reach. In the best case this means looking at the data from a gage at the LT. Further, this data, in the best case, has been collected for a long period of time (the longer the better) including wet and dry periods. In the case of **Animas River - Upper** there is a USGS gage record of discharge on the creek. However, the gage station is upstream from the LT. The USGS gage is ANIMAS RIVER AT HOWARDSVILLE, CO (USGS 09357500); it has a period of record (POR) of 47 years collected between 1935 and 1982. The gage is at an elevation of 9,616.98 ft above mean sea level (amsl) and has a drainage area of 55.9 mi^2. The hydrograph (plot of discharge over time) produced from this gage includes the consumptive uses of several diversions in the basin above the gage. However, the existence of these diversions is not a major limitation upon the use of the data from the gage. To make the measured data transferable to Animas River - Upper above the LT, the consumptive portions of these diversions were added back to the measured hydrograph. The resulting "adjusted" hydrograph could then be used on Animas River - Upper above the LT by multiplying the "adjusted" gage discharge values by an area ratio; specifically, the area of Animas River - Upper above the LT (42.77 mi^2) to Animas River at Howardsville (55.9 mi^2). Next, the resulting proportioned "adjusted" hydrograph was itself "adjusted" (decreased) to reflect depletions on Animas River - Upper above the LT resulting from upstream consumptive irrigation uses. The final hydrograph thus represents a distribution of flow over time that has been reduced to reflect existing human uses.

{The Following discussion is based upon the US Geological Survey's *Techniques of Water-Resources Investigations* Series, *Book 4: Hydrologic Analysis and Interpretation, Chapter A3: Statistical Methods in Water Resources* (Chapter 3: Describing Uncertainty) by D.R. Helsel and R. M. Hirsch. This technical reference provides the scientific background and guidance important to the systematic interpretation of hydrologic data. The document is available online and is a valuable aid to understanding and interpreting the analyses described here.}

The next step in producing a representation of the discharge at Animas River - Upper is to compute the Geometric Mean of the area-prorated "adjusted" data values from the Animas River at Howardsville hydrograph. This step is of value because of the inherent statistical weaknesses found in any collection of data intended to measure natural stream discharge. Without getting into the details of statistical theory, it is worth noting that a set of discharge measurements is inherently inaccurate, no matter how well collected, due to the difficulties attendant to data collection, especially hydrologic data. To give deference to this fact and to increase the value of the hydrograph product of this analysis, the Geometric Means of the data were computed and plotted along with the 95% Confidence Intervals about the data. The resultant hydrograph, including recommended Instream Flow values, is displayed in Figure 1 with the data displayed in Table 2.

Figure 1

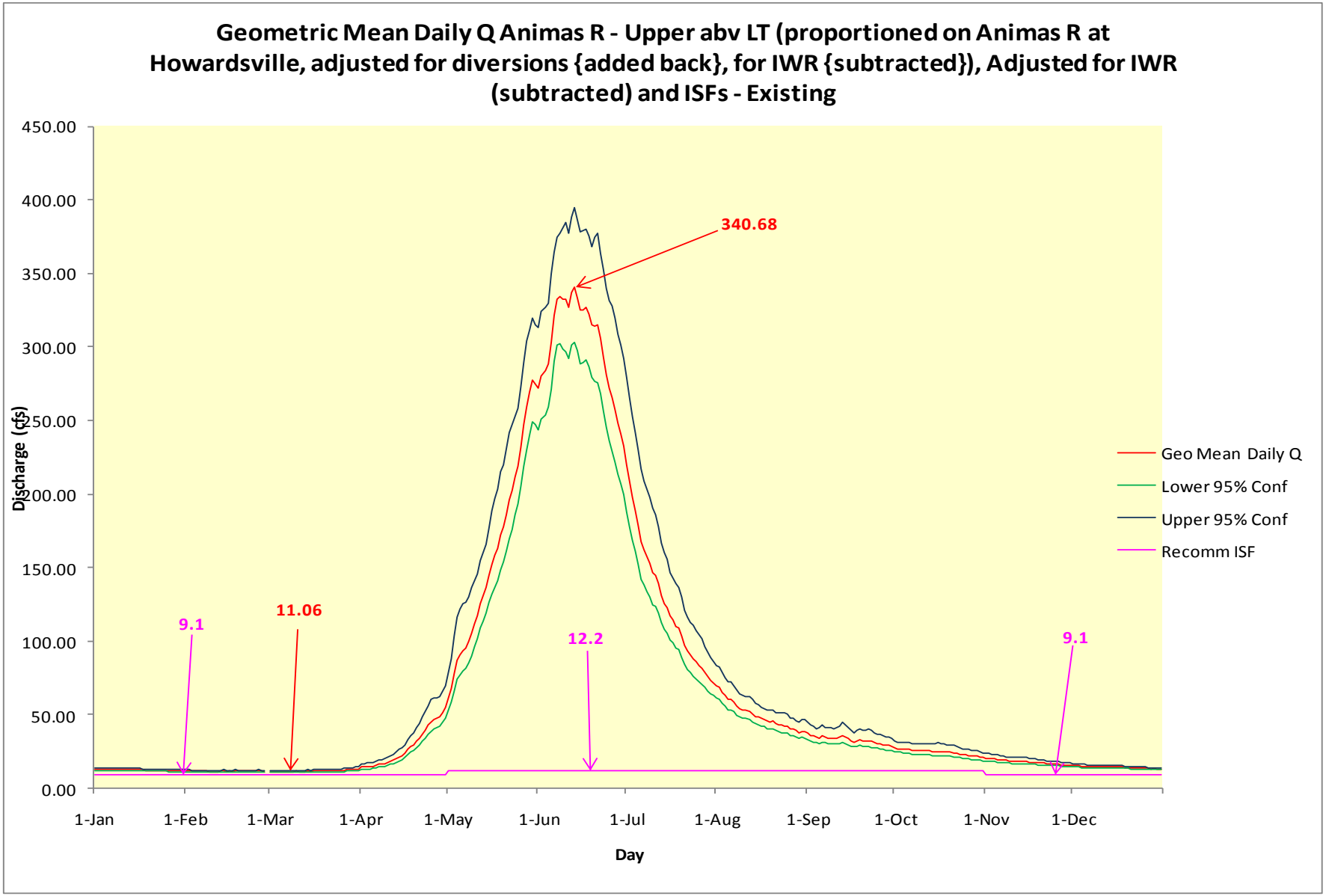

Geometric Mean Daily Q Animas R - Upper abv LT (proportioned on Animas R at Howardsville, adjusted for diversions {added back}, for IWR {subtracted}), Adjusted for IWR (subtracted) and ISFs - Existing
450.00
400.00
350.00
300.00
250.00
200.00
150.00
100.00
50.00
0.00
Discharge (cfs)
340.68
11.06
9.1
12.2
9.1
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
1-Oct
1-Nov
1-Dec
Day
Geo Mean Daily Q
Lower 95% Conf
Upper 95% Conf
Recomm ISF

Table 2. Geometric Mean Discharge and Recommended Instream Flows		
Date	Recommended ISF	Proportioned Adjusted GM (abv gage) Adj (-) for Irr & OoB in Animas R - Upper abv LT
1-Jan	9.1	12.82
2-Jan	9.1	12.67
3-Jan	9.1	12.69
4-Jan	9.1	12.54
5-Jan	9.1	12.62
6-Jan	9.1	12.60
7-Jan	9.1	12.65
8-Jan	9.1	12.49
9-Jan	9.1	12.59
10-Jan	9.1	12.52
11-Jan	9.1	12.56
12-Jan	9.1	12.49
13-Jan	9.1	12.40
14-Jan	9.1	12.37
15-Jan	9.1	12.35
16-Jan	9.1	12.32
17-Jan	9.1	12.34
18-Jan	9.1	12.24
19-Jan	9.1	12.19
20-Jan	9.1	12.10
21-Jan	9.1	12.12
22-Jan	9.1	11.98
23-Jan	9.1	11.96
24-Jan	9.1	11.99
25-Jan	9.1	12.06
26-Jan	9.1	11.89
27-Jan	9.1	11.89
28-Jan	9.1	11.82
29-Jan	9.1	11.83
30-Jan	9.1	11.77
31-Jan	9.1	11.77
1-Feb	9.1	11.64
2-Feb	9.1	11.62
3-Feb	9.1	11.50
4-Feb	9.1	11.49
5-Feb	9.1	11.46
6-Feb	9.1	11.37
7-Feb	9.1	11.35
8-Feb	9.1	11.35
9-Feb	9.1	11.31
10-Feb	9.1	11.24
11-Feb	9.1	11.28
12-Feb	9.1	11.23
13-Feb	9.1	11.38
14-Feb	9.1	11.47
15-Feb	9.1	11.24

16-Feb	9.1	11.43
17-Feb	9.1	11.33
18-Feb	9.1	11.57
19-Feb	9.1	11.51
20-Feb	9.1	11.47
21-Feb	9.1	11.44
22-Feb	9.1	11.34
23-Feb	9.1	11.37
24-Feb	9.1	11.44
25-Feb	9.1	11.42
26-Feb	9.1	11.54
27-Feb	9.1	11.48
28-Feb	9.1	11.25
29-Feb	9.1	
1-Mar	9.1	11.26
2-Mar	9.1	11.22
3-Mar	9.1	11.15
4-Mar	9.1	11.16
5-Mar	9.1	11.23
6-Mar	9.1	11.24
7-Mar	9.1	11.13
8-Mar	9.1	11.06
9-Mar	9.1	11.11
10-Mar	9.1	11.38
11-Mar	9.1	11.26
12-Mar	9.1	11.20
13-Mar	9.1	11.24
14-Mar	9.1	11.41
15-Mar	9.1	11.33
16-Mar	9.1	11.35
17-Mar	9.1	11.42
18-Mar	9.1	11.39
19-Mar	9.1	11.33
20-Mar	9.1	11.50
21-Mar	9.1	11.57
22-Mar	9.1	11.59
23-Mar	9.1	11.75
24-Mar	9.1	11.81
25-Mar	9.1	12.01
26-Mar	9.1	12.08
27-Mar	9.1	12.35
28-Mar	9.1	12.33
29-Mar	9.1	12.46
30-Mar	9.1	12.79
31-Mar	9.1	13.14
1-Apr	9.1	14.11
2-Apr	9.1	14.22
3-Apr	9.1	14.39
4-Apr	9.1	14.56
5-Apr	9.1	14.92
6-Apr	9.1	15.48

7-Apr	9.1	16.12
8-Apr	9.1	16.23
9-Apr	9.1	16.64
10-Apr	9.1	17.52
11-Apr	9.1	18.14
12-Apr	9.1	18.71
13-Apr	9.1	19.59
14-Apr	9.1	20.90
15-Apr	9.1	22.14
16-Apr	9.1	23.73
17-Apr	9.1	26.08
18-Apr	9.1	28.01
19-Apr	9.1	29.20
20-Apr	9.1	31.60
21-Apr	9.1	34.08
22-Apr	9.1	36.56
23-Apr	9.1	39.43
24-Apr	9.1	42.52
25-Apr	9.1	45.14
26-Apr	9.1	46.60
27-Apr	9.1	47.24
28-Apr	9.1	48.55
29-Apr	9.1	51.57
30-Apr	9.1	54.52
1-May	12.2	61.24
2-May	12.2	68.03
3-May	12.2	77.72
4-May	12.2	86.91
5-May	12.2	90.32
6-May	12.2	93.42
7-May	12.2	95.58
8-May	12.2	99.39
9-May	12.2	104.83
10-May	12.2	111.41
11-May	12.2	117.18
12-May	12.2	125.03
13-May	12.2	130.63
14-May	12.2	136.69
15-May	12.2	144.62
16-May	12.2	151.86
17-May	12.2	157.98
18-May	12.2	163.31
19-May	12.2	171.85
20-May	12.2	177.62
21-May	12.2	186.27
22-May	12.2	195.66
23-May	12.2	202.27
24-May	12.2	211.91
25-May	12.2	218.58
26-May	12.2	231.24
27-May	12.2	246.87

28-May	12.2	259.42
29-May	12.2	269.05
30-May	12.2	277.72
31-May	12.2	274.85
1-Jun	12.2	272.01
2-Jun	12.2	280.49
3-Jun	12.2	283.64
4-Jun	12.2	288.63
5-Jun	12.2	303.27
6-Jun	12.2	321.46
7-Jun	12.2	332.36
8-Jun	12.2	334.05
9-Jun	12.2	332.69
10-Jun	12.2	332.33
11-Jun	12.2	327.27
12-Jun	12.2	337.07
13-Jun	12.2	340.68
14-Jun	12.2	333.60
15-Jun	12.2	324.82
16-Jun	12.2	325.13
17-Jun	12.2	327.11
18-Jun	12.2	322.58
19-Jun	12.2	315.21
20-Jun	12.2	314.56
21-Jun	12.2	314.62
22-Jun	12.2	305.45
23-Jun	12.2	293.38
24-Jun	12.2	281.30
25-Jun	12.2	272.14
26-Jun	12.2	265.49
27-Jun	12.2	257.53
28-Jun	12.2	247.88
29-Jun	12.2	240.49
30-Jun	12.2	232.35
1-Jul	12.2	220.10
2-Jul	12.2	208.44
3-Jul	12.2	197.90
4-Jul	12.2	188.97
5-Jul	12.2	178.42
6-Jul	12.2	167.51
7-Jul	12.2	161.86
8-Jul	12.2	157.20
9-Jul	12.2	152.71
10-Jul	12.2	146.53
11-Jul	12.2	144.45
12-Jul	12.2	138.99
13-Jul	12.2	130.96
14-Jul	12.2	125.84
15-Jul	12.2	122.40
16-Jul	12.2	116.88
17-Jul	12.2	114.13

18-Jul	12.2	110.15
19-Jul	12.2	109.02
20-Jul	12.2	103.24
21-Jul	12.2	96.99
22-Jul	12.2	93.18
23-Jul	12.2	90.43
24-Jul	12.2	88.19
25-Jul	12.2	85.83
26-Jul	12.2	83.44
27-Jul	12.2	81.45
28-Jul	12.2	78.28
29-Jul	12.2	75.60
30-Jul	12.2	73.01
31-Jul	12.2	71.38
1-Aug	12.2	69.16
2-Aug	12.2	68.16
3-Aug	12.2	65.15
4-Aug	12.2	62.72
5-Aug	12.2	59.92
6-Aug	12.2	59.92
7-Aug	12.2	58.53
8-Aug	12.2	55.76
9-Aug	12.2	54.09
10-Aug	12.2	52.99
11-Aug	12.2	52.70
12-Aug	12.2	52.52
13-Aug	12.2	50.68
14-Aug	12.2	48.73
15-Aug	12.2	48.06
16-Aug	12.2	47.17
17-Aug	12.2	46.38
18-Aug	12.2	45.31
19-Aug	12.2	44.91
20-Aug	12.2	45.28
21-Aug	12.2	43.59
22-Aug	12.2	43.04
23-Aug	12.2	42.55
24-Aug	12.2	42.36
25-Aug	12.2	41.81
26-Aug	12.2	40.12
27-Aug	12.2	39.89
28-Aug	12.2	38.83
29-Aug	12.2	37.88
30-Aug	12.2	38.74
31-Aug	12.2	38.55
1-Sep	12.2	37.27
2-Sep	12.2	35.91
3-Sep	12.2	35.17
4-Sep	12.2	34.29
5-Sep	12.2	34.05
6-Sep	12.2	35.17

7-Sep	12.2	34.52
8-Sep	12.2	34.00
9-Sep	12.2	34.04
10-Sep	12.2	33.79
11-Sep	12.2	34.15
12-Sep	12.2	34.59
13-Sep	12.2	35.34
14-Sep	12.2	34.25
15-Sep	12.2	33.58
16-Sep	12.2	32.29
17-Sep	12.2	31.42
18-Sep	12.2	32.03
19-Sep	12.2	32.86
20-Sep	12.2	32.27
21-Sep	12.2	32.27
22-Sep	12.2	32.20
23-Sep	12.2	31.52
24-Sep	12.2	30.91
25-Sep	12.2	30.50
26-Sep	12.2	30.17
27-Sep	12.2	29.59
28-Sep	12.2	28.94
29-Sep	12.2	29.11
30-Sep	12.2	28.59
1-Oct	12.2	27.21
2-Oct	12.2	26.88
3-Oct	12.2	26.84
4-Oct	12.2	26.46
5-Oct	12.2	26.60
6-Oct	12.2	26.14
7-Oct	12.2	25.79
8-Oct	12.2	25.46
9-Oct	12.2	25.38
10-Oct	12.2	25.28
11-Oct	12.2	25.16
12-Oct	12.2	25.34
13-Oct	12.2	25.37
14-Oct	12.2	24.94
15-Oct	12.2	24.93
16-Oct	12.2	25.00
17-Oct	12.2	24.79
18-Oct	12.2	24.47
19-Oct	12.2	24.29
20-Oct	12.2	24.22
21-Oct	12.2	23.87
22-Oct	12.2	23.43
23-Oct	12.2	23.13
24-Oct	12.2	22.45
25-Oct	12.2	22.35
26-Oct	12.2	22.17
27-Oct	12.2	21.79

28-Oct	12.2	21.62
29-Oct	12.2	21.48
30-Oct	12.2	21.03
31-Oct	12.2	20.56
1-Nov	9.1	20.22
2-Nov	9.1	20.04
3-Nov	9.1	19.90
4-Nov	9.1	19.81
5-Nov	9.1	19.43
6-Nov	9.1	19.18
7-Nov	9.1	18.91
8-Nov	9.1	18.71
9-Nov	9.1	18.52
10-Nov	9.1	18.24
11-Nov	9.1	18.26
12-Nov	9.1	18.36
13-Nov	9.1	18.33
14-Nov	9.1	18.07
15-Nov	9.1	18.01
16-Nov	9.1	17.70
17-Nov	9.1	17.60
18-Nov	9.1	17.41
19-Nov	9.1	17.10
20-Nov	9.1	17.00
21-Nov	9.1	16.92
22-Nov	9.1	16.79
23-Nov	9.1	16.68
24-Nov	9.1	16.56
25-Nov	9.1	16.35
26-Nov	9.1	16.20
27-Nov	9.1	15.88
28-Nov	9.1	15.67
29-Nov	9.1	15.63
30-Nov	9.1	15.60
1-Dec	9.1	15.34
2-Dec	9.1	15.25
3-Dec	9.1	15.10
4-Dec	9.1	14.94
5-Dec	9.1	14.66
6-Dec	9.1	14.36
7-Dec	9.1	14.47
8-Dec	9.1	14.30
9-Dec	9.1	14.39
10-Dec	9.1	14.55
11-Dec	9.1	14.43
12-Dec	9.1	14.30
13-Dec	9.1	14.22
14-Dec	9.1	14.09
15-Dec	9.1	14.23
16-Dec	9.1	14.10
17-Dec	9.1	14.11

18-Dec	9.1	14.10
19-Dec	9.1	14.00
20-Dec	9.1	13.95
21-Dec	9.1	13.78
22-Dec	9.1	13.65
23-Dec	9.1	13.56
24-Dec	9.1	13.51
25-Dec	9.1	13.48
26-Dec	9.1	13.34
27-Dec	9.1	13.19
28-Dec	9.1	13.10
29-Dec	9.1	13.17
30-Dec	9.1	13.16
31-Dec	9.1	13.14

Existing Water Right Information

Staff has analyzed the water rights tabulation and contacted the Division Engineer Office (DEO) to identify any potential water availability problems. There are no decreed surface diversions within this reach of stream. Staff has determined that water is available for appropriation on the Animas River, between the confluence with Minnie Gulch and the confluence with Cunningham Creek, to preserve the natural environment to a reasonable degree without limiting or foreclosing the exercise of valid existing water rights.

CWCB Staff's Instream Flow Recommendation

Staff recommends the Board form its intent to appropriate on the following stream reach:

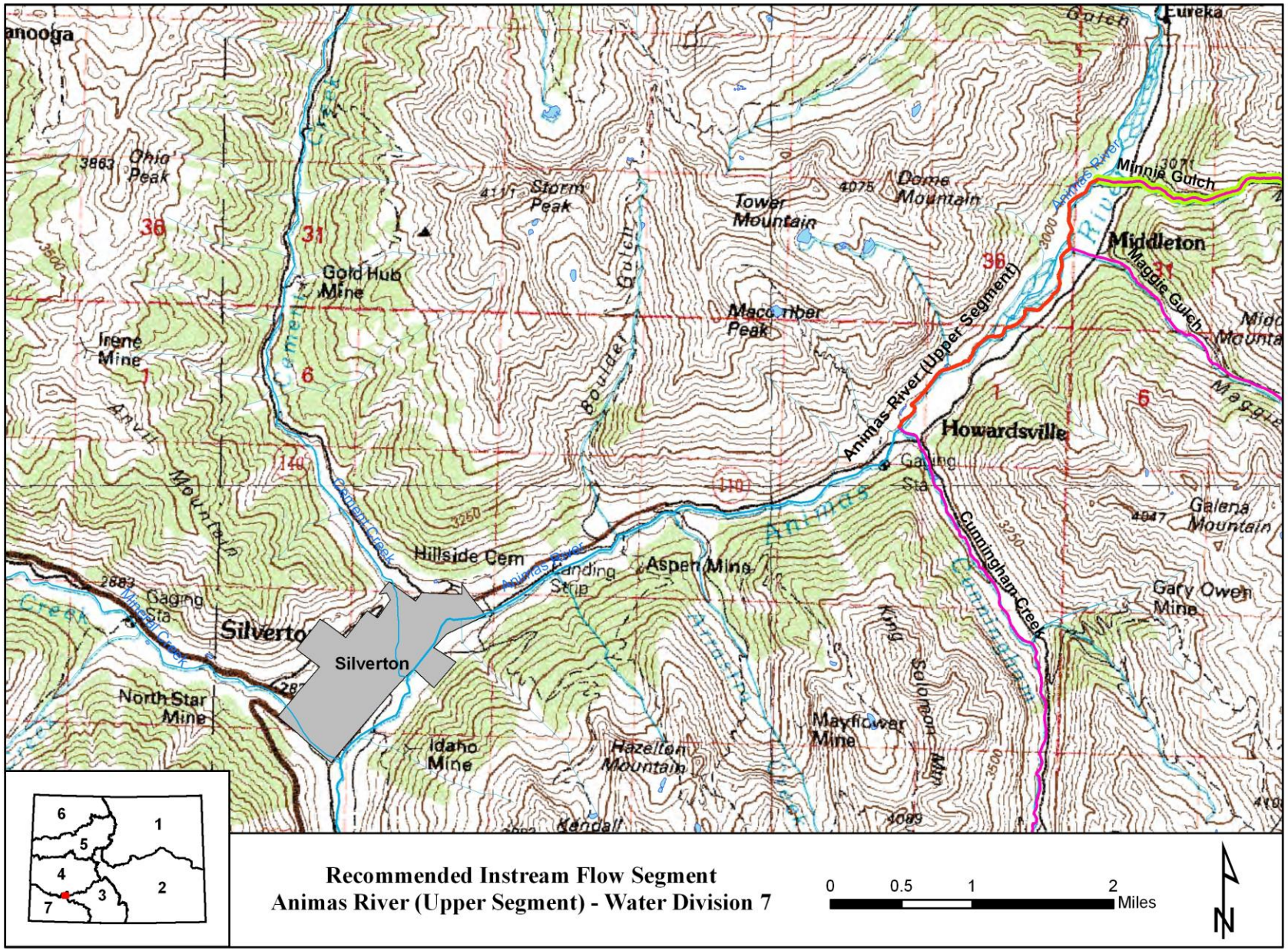
Segment: Confluence with Minnie Gulch to Confluence with Cunningham Creek

Upper Terminus: CONFLUENCE WITH MINNIE GULCH
(Latitude 37° 51' 44.73"N) (Longitude 107° 34' 22.68"W)
UTM North: 4193671.4 UTM East: 273660.18
SE SW S30 T42N R6W NMPM
1400' East of the West Section Line; 510' North of the South Section Line

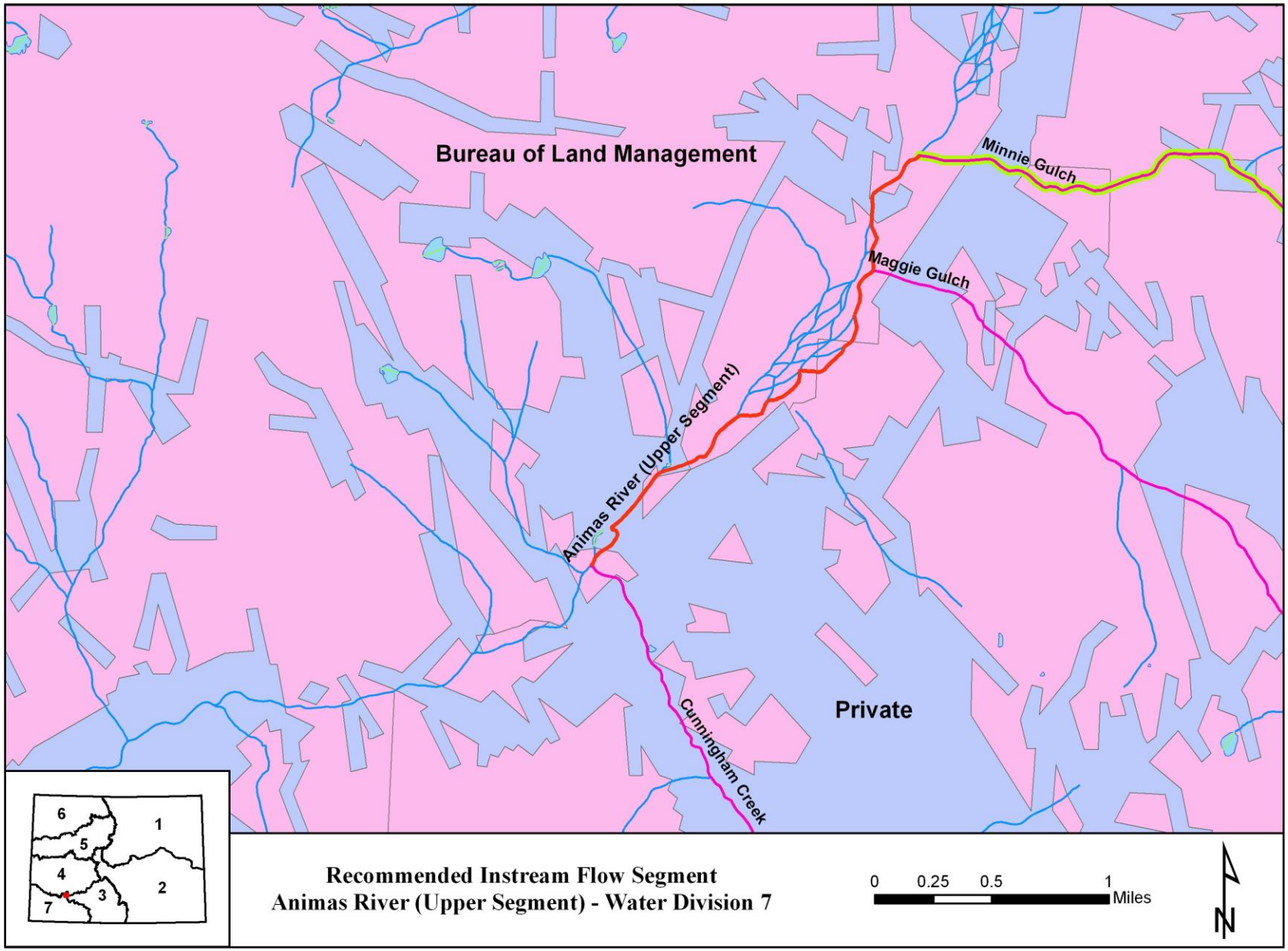
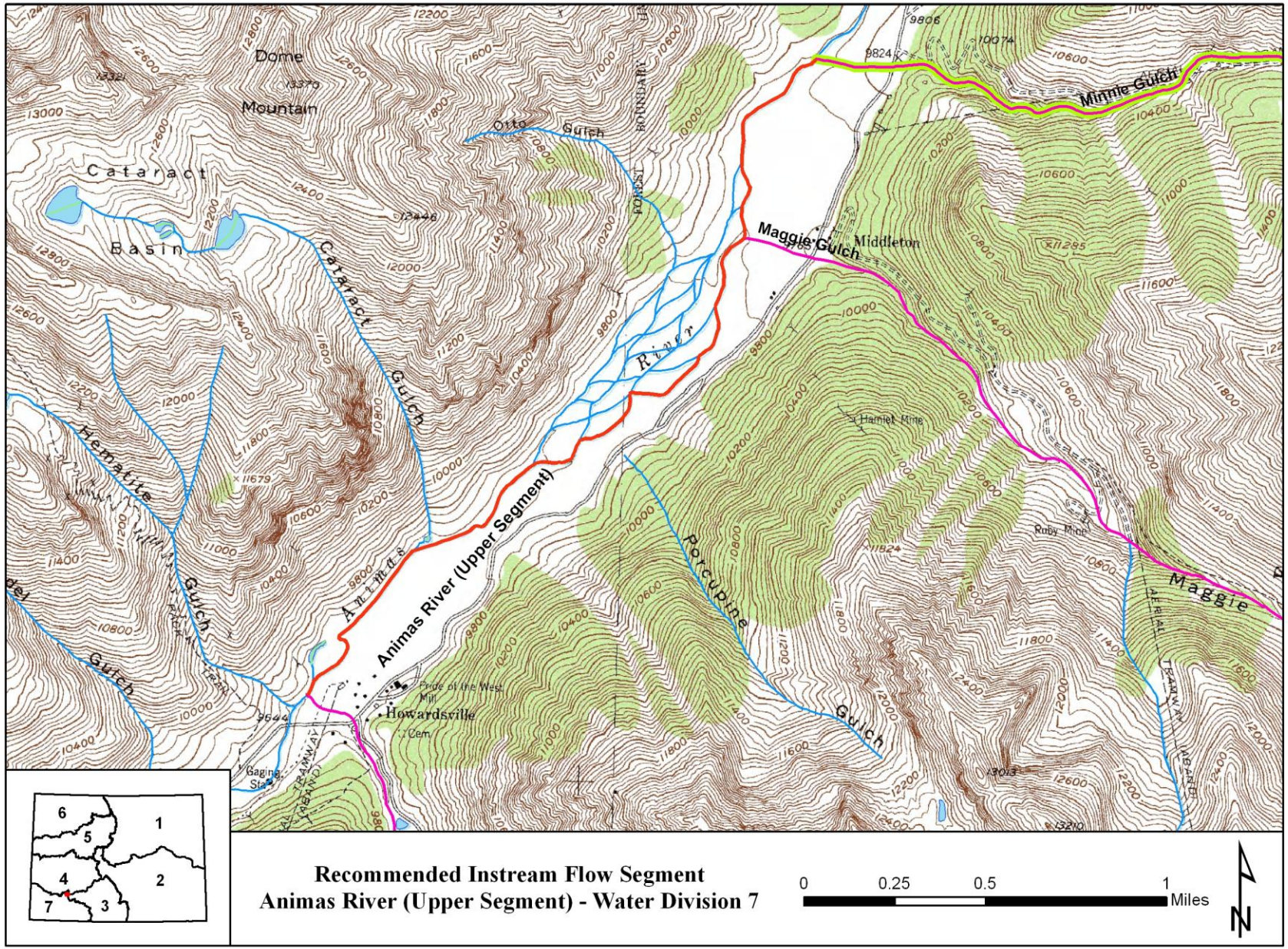
Lower Terminus: CONFLUENCE WITH CUNNINGHAM CREEK
(Latitude 37° 50' 11.15"N) (Longitude 107° 35' 51.91"W)
UTM North: 4190846.86 UTM East: 271398.94
NE SE S2 T41N R7W NMPM
475' West of the East Section Line; 1600' North of the South Section Line

Watershed: Animas (HUC#: 14080104**)**
Counties: San Juan
Length: 2.58 miles
USGS Quad(s): Howardsville
Flow Recommendation: 12.2 cfs (May 1 – October 31)
9.1 cfs (November 1 – April 30)

Vicinity Map



Land Use Map


Bureau of Land Management
Minnie Gulch
Maggie Gulch
Animas River (Upper Segment)
Cunningham Creek
Private
6
1
5
4
2
3
7
Recommended Instream Flow Segment
Animas River (Upper Segment) - Water Division 7
0
0.25
0.5
1
Miles
N

Topographic and Water Rights Map