EAGLE MINE ANNUAL REPORT – 2014

EAGLE MINE SITE
MINTURN, COLORADO

Prepared for:
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April 10, 2015

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APPENDICES

1.0 INTRODUCTION

This Annual Site Monitoring and Activity Report (Annual Report) was prepared by NewFields on behalf of CBS Operations Inc. (CBS) and provides a summary of environmental data collected during the 2014 calendar year at the Eagle Mine (Site) near Minturn, Colorado. The Site location and vicinity are shown on Figure 1-1. The Annual Report also summarizes design, construction, inspection, operation and maintenance, and community relation activities conducted in 2014 in connection with the Site.

This Annual Report is a deliverable listed in Table A of the Final Statement of Work - Part A (Appendix B) for the Operable Unit No. 1 Partial Consent Decree, Civil Action No. 95-N-2360 (D. Colorado) (CD/SOW). This Annual Report also satisfies the requirement for an annual monitoring report specified in the Consent Decree, Order, Judgment and Reference to the Special Master for Civil Action No. 83-C-2387 (D. Colorado), Remedial Action Plan, as amended (CD/RAP).

Monitoring activities, data summaries, interpretation and analysis of selected data, and summaries of Site activities are provided in the following sections:

- Section 2 Surface Water Monitoring and Data Summary
- Section 3 Eagle Mine Water Monitoring and Data Summary
- Section 4 Groundwater Monitoring and Data Summary
- Section 5 Summary of Site Activities.

Figures and tables are presented at the end of each section.

Figure 1-1 Eagle Mine Site

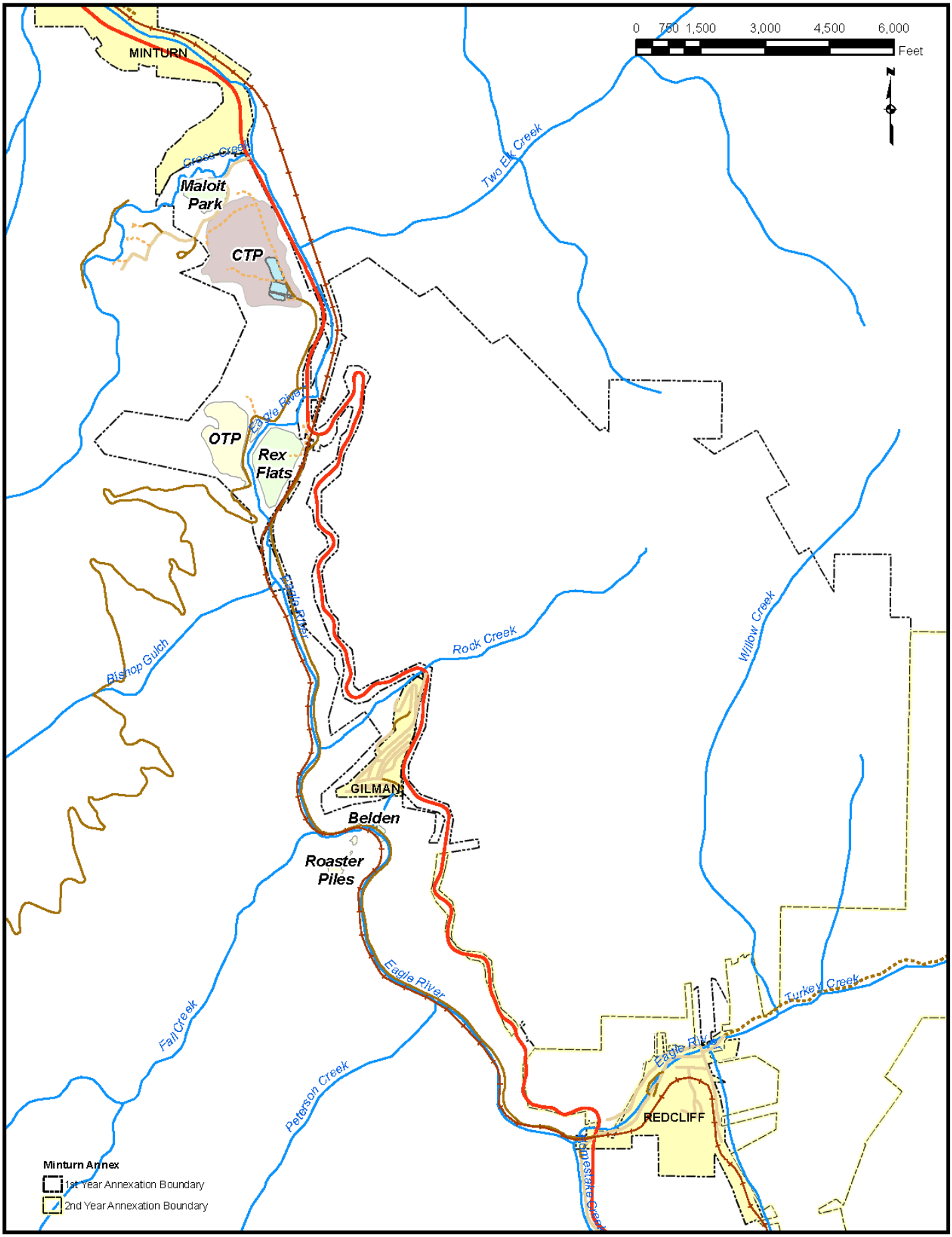


Figure 1-1 Eagle Mine Site

2.0 SURFACE WATER MONITORING AND DATA SUMMARY

This section provides a summary of surface water monitoring activities at the Site for the reporting period, Fall 2013 through Fall 2014 (fall monitoring occurs in either September or October). Surface water monitoring was originally conducted in accordance with the requirements of the Surface Water Sampling and Analysis Plan (Dames & Moore 1996). The monitoring activities have changed over the years and the scope for each year of monitoring is submitted beforehand in a memorandum for Surface Water and Groundwater Monitoring for the subject year ("2014 Monitoring Plan", NewFields 2014). Surface water monitoring for 2014 was finalized with Colorado Department of Public Health and Environment (CDPHE) and US Environmental Protection Agency (EPA) on January 27, 2014.

2.1 Monitoring Stations

The Colorado Water Quality Control Commission (WQCC) has established water quality standards for segments of the upper Eagle River and its major tributaries. The four mainstem segments are described by WQCC as:

- 2 – Mainstem of the Eagle River from the confluence with Turkey Creek to the compressor house bridge at Belden
- 5a – Mainstem of the Eagle River from the compressor house bridge at Belden to the Highway 24 Bridge near Tigwon Road
- 5b – Mainstem of the Eagle River from Highway 24 Bridge near Tigwon Road to the confluence with Martin Creek
- 5c – Mainstem of the Eagle River from the confluence with Martin Creek to the confluence with Gore Creek.

Additionally Segment 7, Cross Creek, was subdivided into the following two segments:

- 7a – Cross Creek mainstem to the Minturn Middle School
- 7b – Cross Creek from the Minturn Middle School to the confluence with the Eagle River.

Surface water monitoring stations (Figure 2-1) for the Site were established in 1985 at the outset of the remedial investigation, corresponding closely with locations used by the US Geological Survey (USGS) in studies prior to 1985. The following Eagle River stations were monitored at least once during the reporting period:

- E-3 Eagle River above Belden (background location – Segment 2)

- E-10 Eagle River above Rock Creek (Segment 5a)
- E-12A Eagle River below Old Tailings Pile/Rex Flats (Segment 5a)
- E-15 Eagle River below Cross Creek (Segment 5b)
- E-22 Eagle River above Dowds Junction (Segment 5c).

The following two tributaries to the Eagle River at the Site were monitored:

- T-10 Rock Creek at mouth (tributary to Segment 5a)
- T-18 Cross Creek near mouth (Segment 7b; tributary to Segment 5b).

Other Eagle River tributaries at the Site are, in downstream order, Roaster Pile drainage, Fall Creek, Bishop Gulch, and Two Elk Creek. These tributaries enter the Eagle River between Red Cliff and Minturn but are no longer monitored for water quality or stream flow. Years of sampling data confirm that these tributaries are not metal loading sources to the Eagle River.

For the reporting period, Eagle River and tributary water quality samples were collected pursuant to the methods in the SWGWSP. Surface water quality samples collected in March, April, and September were analyzed for total arsenic and dissolved cadmium, copper, and zinc, as well as for calcium and magnesium for hardness calculations. Field measurements consisted of pH, temperature, and specific conductance.

Stream flow in the Eagle River was monitored using the USGS gage at E-12A (09064600). Stream flow at non-E-12A stations are calculated using historical relationships developed over many years. These historical flow relationships were established between each station and the flow measurement recorded at the E-12A gage. Flow in Rock Creek was manually estimated. For Cross Creek, the USGS stream gage “Cross Creek near Minturn” (09065100) discharge rating data are used to estimate flow for Station T-18.

Water quality data and measured or estimated stream flow are presented with the associated water quality data in Appendix A-1. Equations for the estimated flow rates for non-measured stations based on the E-12A measured flow (USGS gage 09064600) are included in Appendix A-2.

2.2 Hydrology

Included in this section are background information on the hydrologic monitoring program, a comparison of 2013 and 2014 stream flows to historical conditions, and a discussion of stream flow during water quality sampling events.

The Eagle River and its tributaries exhibit a large seasonal fluctuation in stream flow each year that is typical of most high-elevation watersheds in the central Rocky Mountains. Eagle River stream flow at the Site is illustrated in the hydrograph shown in Figure 2-2.

Eagle River watershed topographic elevation ranges from 8000 ft mean sea level (MSL) at the Site to over 14,000 ft MSL at the headwaters of the Eagle River, with precipitation greater in the higher elevations. From November through April each year, a seasonal snowpack accumulates in the watershed with greater snow accumulation at higher elevations. During the winter, mean daily temperatures are typically below freezing and stream flow in the Eagle River and its tributaries is at a minimum. The Eagle River winter base flow period at the Site extends from November to March each year and stream flow typically ranges from about 30 to 40 cubic feet per second (cfs). Small fluctuations in Eagle River stream flow occur during winter because of ice freezing and thawing on the river channel bed and banks.

Site snowpack begins to melt in March and April, followed by snowmelt from progressively higher elevations in the watershed through June each year. In May, Eagle River flow is usually dominated by high-elevation basin-wide snowmelt upstream from the Site. Large diurnal flow fluctuations occur because of daily snowmelt during this period. Peak flows in excess of 800 cfs are common in the Eagle River at the Site during the spring runoff period. Stream flow recedes from July through October each year, with periodic flow increases resulting from summer rainfall-runoff events.

2.2.1 Eagle River

USGS records continuous stage height readings at a stream gage located at E-12A (see Figure 2-1). The gage is at an elevation of 8080 ft MSL and represents a drainage area of 186 square miles.

The gage is operational during ice-free periods (eight months each year) from about March 15 to November 15 and collects estimated measurements during the ice periods. The channel at the gage typically becomes ice-covered in November and ice on the controls affects the stage height readings throughout the winter months. According to USGS criteria, the gage records are considered good (90 percent of the daily discharges are within 10 percent of their true value) except for records estimated during ice periods, which are fair (within 15 percent). Discharge during ice periods is estimated from direct stream flow measurements and stage height measurements that are corrected for ice effect.

A preliminary discharge rating has been developed for the Eagle River at the E-12A stream gage and its accuracy is evaluated regularly using current discharge measurements. The USGS is involved in the operation and maintenance of the gage through a cooperative agreement with Eagle County and CBS. The USGS publishes mean

daily discharge data on a real-time basis on their website http://waterdata.usgs.gov/co/nwis for USGS station 09064600.

Figure 2-3 presents the 2013-2014 flow year divided into three flow periods: 2013-2014 winter low flow, 2014 spring/summer high flow, and 2014 fall low flow. The dates when CBS samples were collected periods are labeled on Figure 2-3 and are marked to indicate the sampling entity: "S" for CBS, "s" for River Watch or "e" for Eagle River Water & Sanitation District. Sample results for the latter two organizations are provided by Eagle River Watershed Council; selection is primarily based on data availability (all analytes from one organization) and lowest detection limits..

Eagle River stream flow at the Site was well above average during the peak flow period in 2014 (see Figure 2-2). Stream flow was normal (26 to 39 cfs) through the winter of 2013-2014 (see Figure 2-3). Flows were slow to rise but in early April rose quite steeply to above the average flow levels for the high flow season. As of May 1, 2014, the Upper Colorado River Basin snowpack, as estimated by the Natural Resources Conservation Service (NRCS), was 122 percent of normal compared to 100 percent in 2013 (NRCS 2014). The highest river flow recorded for the season was on May 30, 2014 at 1,430 cfs at station E-12A. By July 21, 2014, the daily average flows were below 150 cfs, approximately the same as average/normal flows. High flows were observed within the typical 90-day high flow window. Stream flow continued with normal flows to approximately mid-August when fall rains raised the river flow back up (78 cfs) to above average (56 cfs). These higher rates continued through October.

2.2.2 Tributaries

Rock Creek is a perennial tributary entering the Eagle River between stations E-10 and E-11 (see Figure 2-1), draining approximately 1.5 square miles. Flow measurements are estimated visually, with a bucket and stopwatch, or calculated using the measured rate of flow (in feet/sec) for the 48-foot-long, 72-inch diameter culvert at the base of Rock Creek (T-10) at the confluence with the Eagle River. Rock Creek flows typically increase from snowmelt beginning in March or April with peak flows occurring in May or June. In 2014, Rock Creek flow contributed typically less than 1 percent of the Eagle River flow, with one early April flow contributing 3.8 percent (4/3/2014).

Cross Creek is a perennial tributary entering the Eagle River between stations E-13B and E-15 (see Figure 2-1) draining approximately 34.2 square miles. Stream flow (measured at USGS station 09065100 or T-18) ranges from less than 5 cfs during the winter season to peak flows between 150 and 200 cfs in May and early June. In 2014, the Cross Creek high flows were similar to the Eagle River with higher than average flows (maximum flow of 497 cfs on May 30, 2014). Flows dropped below average by mid July 2014 but, again similar to the Eagle River, flows responded to the fall rains with higher than average fall flows (see Figure 2-4). In 2014, Cross Creek flow contributed

approximately 27 percent of the Eagle River flow during the winter, 37 percent during high flow, and 33 percent during fall low flow.

2.3 Water Quality Trends

Through a cooperative process involving all major stakeholders, water quality standards (WQS) were developed for the Colorado Water Quality Control Division (the Commission) that are protective of the aquatic community (macroinvertebrates and brown trout) expected in Segment 5 of the Eagle River and Cross Creek. The WQS were put in place on January 1, 2009, replacing the Temporary Modifications to the table value standards (TVS) provided in Regulation No. 33. The following sections discuss water quality data at the monitored stations focusing on dissolved levels of zinc, cadmium, and copper.

2.3.1 Eagle River Water Quality

Table 2-1 through Table 2-3 present the dissolved concentrations for cadmium, copper, and zinc, respectively, for the past five years, 2010 to 2014. These tables present the concentrations for Eagle River monitoring stations E-3, E-10, E-12A, E-15, and E-22. The tables also present the associated load for the CBS measured concentrations by monitoring station (see Section 2.4 for discussion of load within the river). Flow and chemical results for 2014 are provided in Appendix A.

Dissolved zinc concentrations for the Eagle River are plotted in Figure 2-5 for the reporting period October 2013 to October 2014. The WQS by segment of the Eagle River are plotted on Figure 2-6 and are compared to the monitoring station dissolved zinc concentrations. RiverWatch and ERWSD also collect surface water samples monthly at E-12A (Station 950) and E-15 (Station 3291). These data were used to supplement Figures 2-5 and 2-6 in the months for which CBS had not collected samples as well as providing additional data for the Spring months (Data with the lowest detection limit has primacy when both results are reported).

Higher dissolved zinc concentrations are typically observed in the river during snowmelt periods in March and April and may extend into May. Generally by May each year, warm temperatures generate snowmelt in the upper Eagle River basin above the Site and a large increase in stream flow occurs, with peak flows typically occurring in May or June. The increased stream flow results in lower metal concentrations.

Graphical representation of concentration data for dissolved zinc, cadmium, and copper is provided in Figure 2-7. These plots show concentrations for the Eagle River stations over the 2014 period.

As discussed in previous years and in Section 4.1, the source of increased zinc concentrations in the Spring is believed to be from a groundwater surge in the Belden area. This typical Spring increase can be seen in the Segment 5 stations, depicted on Figure 2-6, and are generally below the WQS. In April 2014 the dissolved zinc concentrations at station E-10 and E-12A rose above the WQS when calculated using the station's average hardness (Figure 2-7) and the sample specific hardness (Figure 2-6). Dissolved zinc concentrations rose in the other stations but were at or below the WQS when using the average hardness (Figure 2-7). Zinc concentrations at E-15 and E-22 were above the WQS in April when the sample's specific hardness was used to calculate the WQS (Figure 2-6). Since the higher zinc concentrations in April occurred at both E-12A and E-10, the source of the increased zinc concentration is believed to be from groundwater in Belden.

Dissolved cadmium concentrations, shown in Figure 2-7, are below the standards for the high metal season. Copper concentrations, shown in Figure 2-7, were also below standards at all stations within the Site. The copper concentration at E-3 on March 20, 2014 was above the WQS for Segment 2.

2.3.2 Tributary Water Quality

Trends in dissolved zinc concentrations for Rock Creek and Cross Creek are discussed in the following sections. Table 2-4 and Table 2-5 present the dissolved concentrations for cadmium, copper, and zinc for the past five years, 2010 to 2014, in Rock Creek (T-10) and Cross Creek (T-18), respectively. The tables also present the associated load for the measured concentrations by monitoring station (see Section 2.4 for discussion of load within the river). Flow and chemical results for the reporting period are provided in Appendix A.

Rock Creek

Water samples have been collected routinely from the mouth of Rock Creek (T-10) since March 1989. Dissolved zinc results for T-10 from March 1989 to September 2014 are presented in Figure 2-8.

Water quality in Rock Creek is influenced by large seasonal fluctuations in stream flow, seepage from the Eagle Mine, and waste-rock pile runoff. Metal concentrations typically increase in April during early spring snowmelt runoff and decrease rapidly in May and June as basin-wide stream flow increases. Concentrations typically remain low during the summer months except during rainfall-runoff events. Concentrations increase in fall and winter under reduced stream flow conditions.

Significant improvements in Rock Creek water quality have occurred since 1989. Factors contributing to a continued decrease in metals concentrations in Rock Creek

include lowering the mine pool elevation, collection and treatment of mine seepage and groundwater in lower Rock Creek at the RX-3 well, and the diversion and treatment of runoff/seepage from the hillside below Waste Rock Pile No. 8.

Cross Creek

Dissolved metal concentrations have been routinely measured near the mouth of Cross Creek (T-18, see Figure 2-9) since September 1990. The zinc concentration at T-18 dropped significantly in 1996 following the remediation of the Maloit Park wetlands. As seen in Figure 2-10, all detected metal concentrations are below WQS for Segment 7b.

2.4 Load Source Evaluation

In this section, dissolved zinc load in the river is used to quantify the contribution from point and non-point metal sources. Dissolved zinc load is calculated by multiplying the dissolved zinc concentration (in mg/L) by the flow (in cfs), and converting the units into pounds per day (lbs/day) using a conversion factor of 5.4. In this manner, the dissolved zinc load was calculated for each of the monitoring stations for which flow can be measured or estimated (Table 2-3 through Table 2-5).

Inherent in each computation of load is the calculated error associated with the measurement of metal concentration and stream flow (up to ±25 percent analytical error and ±10 percent flow error). In the analysis of loading by stream segment, it is assumed the computed load incorporates these errors and, as such, retains a compounded error of at least ±20 percent.

Sampling stations located on the mainstem Eagle River bracket the potential metal sources. These sources include tributary inflows from Rock Creek and Cross Creek, in addition to predominately groundwater inflow from the Belden, Old Tailings Pile (OTP)/Rex Flats, and Consolidated Tailings Pile (CTP) areas. Using discrete river segments, the difference in metal load between two stations can be calculated. The amount of load contributed by measured or “accounted” tributary inflows is known. After subtracting the accounted load, the load difference is referred to as the “unaccounted” load. A positive unaccounted load (load increase) includes groundwater and/or diffuse surface-water inflow that are not measured. These are sometimes referred to as non-point source loads. A negative unaccounted load (load decrease) can result from losses of flow to groundwater, or from decreases in metal concentration through attenuation processes such as chemical precipitation or adsorption.

Table 2-6 provides a data summary of the dissolved zinc loading by Eagle River segment for a five-year period of 2010 through 2014. A discussion of peak spring zinc loading by river segment for the sample date April 17, 2014 is provided below, using Figure 2-11 presenting the yearly peak Spring loads for reference.

Background (E-3)

The calculated dissolved zinc load at E-3 (69 lbs/day) represents the background zinc load entering Segment 5a from Segment 2. The source of the background zinc in Segment 2 is thought to be runoff from the numerous smaller mines and associated waste rock piles located along the Eagle River between Red Cliff and Belden. These mines and piles are not associated with the Eagle Mine Site.

Belden (E-3 to E-10)

Upper Segment 5a or Belden segment extends downstream from Segment 2 (station E-3) to station E-10 above Rock Creek. The calculated dissolved zinc load after subtracting background is 94 lbs/day. Investigations indicate that the primary source of the zinc load is groundwater perched in the waste rock and railroad ballast located in Belden. Runoff from the waste rock may contribute to periodic metal loads during spring and summer.

Fall Creek contributes on the order of 10 to 20 percent of the Eagle River flow in this segment. Past studies document that Fall Creek does not contribute significant quantities of metals, and this tributary metal load is assumed to be zero for purposes of load accounting (Dames & Moore 1998).

Rock Creek (E-10 to E-12A)

Lower Segment 5a or Rock Creek segment receives tributary inflow from Rock Creek and Bishop Gulch and groundwater from Rock Creek and the OTP/Rex Flats area. Historical data shows that Bishop Gulch does not contribute significant zinc load to the Eagle River. This segment typically shows a small increase in zinc load relative to the Belden segment.

The calculated dissolved zinc load increased by 17 lbs/day, after subtracting Rock Creek, which contributed 11 lbs/day. The unaccounted source of the zinc is thought to be groundwater baseflow from Rock Creek alluvium, residual groundwater baseflow from Belden segment alluvium, and groundwater seepage from the OTP/Rex Flats area.

CTP (E-12A to E-15)

Segment 5b brackets the CTP and receives flow from Cross Creek, the largest tributary within the Site. Two Elk Creek, a perennial tributary, and discharge from the WTP also flow to the Eagle River in this segment; however, historical data show that the dissolved zinc load contributed by these sources is negligible. The calculated dissolved zinc load increased by 22 lbs/day, after subtracting Cross Creek, which contributed 5.3 lbs/day. The source of the zinc is thought to be primarily groundwater baseflow from OTP/Rex Flats and the CTP.

Table 2-1
Eagle River Cadmium Concentrations and Loads
2010 - 2014

Date	Dissolved Cadmium Concentration [1] (mg/L)					Eagle River Flow (cfs) at	Cadmium Load [1,2] (lbs/day)				
	E- 3	E-10	E-12A	E-15	E-22	E-12A	E- 3	E-10	E-12A	E-15	E-22
3/6/10 [3]		0.00041	0.00033	0.00020	0.00030	18		0.04	0.03	0.02	0.03
3/17/10 [3]		0.00110	0.00037	0.00016	0.00020	23		0.15	0.05	0.03	0.03
4/2/10 [3]		0.00031	0.00050	0.00030	0.00030	31		0.05	0.08	0.07	0.07
4/15/10	0.00012	0.00041	0.00065	0.00053	0.00050	*123*	*0.07*	*0.28*	*0.43*	*0.58*	0.55
9/24/10	0.00005 **	0.00016	0.00019	0.00039	0.00010	41	0.01 **	0.04	0.04	0.13	0.03
3/7/11 [3]		0.00042	0.00045	0.00031	0.00010	32		0.08	0.08	0.07	0.02
3/21/11	0.00040	0.00140	0.00130	0.00092	0.00080	43	0.08	0.34	0.30	0.32	0.27
4/4/11	0.00033	0.00097	0.00190	0.00150	0.00090	66	0.10	0.35	0.68	0.84	0.50
4/18/11	0.00022	0.00078	0.00100	0.00078	0.00080	*119*	*0.13*	*0.51*	*0.64*	*0.82*	0.84
5/4/11	0.00550	0.00110	0.00150	0.00074	0.00090	96	2.52	0.58	0.78	0.62	0.76
10/11/11	0.00005 **	0.00016	0.00025	0.00021		51	0.01 **	0.05	0.07	0.09	
3/12/12	0.00005 **	0.00049	0.00061			25	0.01 **	0.07	0.08		
3/19/12			0.00045			36			0.09		
3/26/12	0.00005 **	0.00035	0.00044	0.00027		85	0.02 **	0.16	0.20	0.20	
4/3/12			0.00036			*116*			*0.23*		
4/10/12	0.00005 **	0.00010	0.00014	0.00005 **		*144*	*0.03* **	*0.08*	*0.11*	*0.064* **	
4/17/12			0.00022			*103*			*0.12*		
10/18/12	0.00005 **	0.00014	0.00018	0.00015	0.00017	28	*0.01* **	0.02	0.03	0.03	0.03
3/12/13 [3]		0.00026	0.00028	0.00015	0.00016	9		0.02	0.01	0.00	0.00
3/22/13	0.00010 **	0.00030	0.00032	0.00021	0.00023	12	*0.01* **	0.02	0.02	0.01	0.01
4/5/13	0.00035	0.00074	0.00074	0.00055	0.00043	38	0.06	0.16	0.15	0.16	0.13
4/19/13	0.00024	0.00066	0.00100	0.00053	0.00044	33	0.04	0.12	0.18	0.13	0.11
5/3/13	0.00045	0.00074	0.00110	0.00064	0.00053	*130*	*0.28*	*0.53*	*0.77*	*0.74*	*0.61*
9/30/13	0.00005 **	0.00005 **	0.00005 **	0.00005 **	0.00005 **	86	0.02 **	0.02 **	0.02 **	0.04 **	0.04 **
3/20/14	0.00018	0.00070	0.00040	0.00043	0.00037	31	0.03	0.12	0.07	0.10	0.09
4/3/14	0.00024	0.00110	0.00100	0.00078	0.00063	38	0.04	0.24	0.21	0.23	0.19
4/17/14	0.00032	0.00081	0.00093	0.00064	0.00059	*143*	*0.22*	*0.63*	*0.72*	*0.82*	*0.75*
9/24/14	0.00005 **	0.00005 **	0.00005 **	0.00005 **	0.00005 **	67	0.02 **	0.02 **	0.02 **	0.03 **	0.03 **

Notes:

Concentrations marked with ** were not detected and reported concentration is estimated and reported at 1/2 the detection limit. Load is calculated using this concentration.

1) Blanks indicate station was not sampled on designated date.
2) Load was calculated using the flow for the designated station and the flow relationship to the E-12A gage (see Appendix A). Loads calculated with flows greater than 100 cfs are flow driven and are italicized
3) Samples were not collected at E-3 due to unsafe ice/river access conditions.

Table 2-2
Eagle River Copper Concentrations and Loads
2010 - 2014

Date	Dissolved Copper Concentration [1] (mg/L)					Eagle River Flow (cfs) at E-12A	Copper Load [1,2] (lbs/day)				
	E- 3	E-10	E-12A	E-15	E-22		E- 3	E-10	E-12A	E-15	E-22
3/6/10 [3]		0.0040	0.0031	0.0021	0.0021	18		0.4	0.3	0.2	0.6
3/17/10 [3]		0.0034	0.0025	0.0010	0.0010	23		0.5	0.3	0.2	0.5
4/2/10 [3]		0.0042	0.0036	0.0023	0.0023	31		0.7	0.6	0.5	0.9
4/15/2010	0.0057	0.0074	0.0072	0.0055	0.0055	*123*	*3.3*	*5.0*	*4.8*	*6.0*	*5.8*
9/24/2010	0.0010	0.0031	0.0023	0.0022	0.0022	41	0.2	0.7	0.5	0.7	1.1
3/7/11 [3]		0.0031	0.0032	0.0072	0.0072	32		0.6	0.6	1.7	1.1
3/21/2011	0.0084	0.0085	0.0068	0.0059	0.0059	43	1.7	2.0	1.6	2.0	2.7
4/4/2011	0.0074	0.0082	0.0084	0.0123	0.0123	66	2.3	3.0	3.0	6.9	4.6
4/18/2011	0.0050	0.0076	0.0106	0.0068	0.0068	*119*	*2.8*	*4.9*	*6.8*	*7.2*	*10.5*
5/4/2011	0.0095	0.0091	0.0093	0.0060	0.0060	96	4.4	4.8	4.8	5.0	8.3
10/11/2011	0.001 **	0.0020	0.001 **	0.001 **	0.001 **	51	0.24 **	0.6	0.28 **	0.42 **	
3/12/12	0.0025	0.0033	0.0026			25	0.3	0.5	0.4		
3/19/12			0.0036			36			0.7		
3/26/12	0.0026	0.0033	0.0041	0.0031		85	1.1	1.5	1.9	2.3	
4/3/12			0.0043			*116*			*2.7*		
4/10/12	0.0027	0.0029	0.0028	0.0027		*144*	*1.9*	*2.3*	*2.2*	*3.5*	
4/17/12			0.0034			*103*			*1.9*		
10/18/12	0.001 **	0.001 **	0.001 **	0.001 **	0.001 **	28	0.13 **	0.16 **	0.15 **	0.20 **	0.20 **
3/12/13 [3]		0.0026	0.001 **	0.001 **	0.001 **	9		0.2	0.05 **	0.03 **	0.03 **
3/22/13	0.002 **	0.002 **	0.002 **	0.002 **	0.002 **	12	0.11 **	0.15 **	0.13 **	0.11 **	0.11 **
4/5/13	0.0078	0.0080	0.0052	0.0039	0.0039	38	1.4	1.7	1.1	1.2	1.2
4/19/13	0.0064	0.0078	0.0085	0.0042	0.0228	33	1.0	1.5	1.5	1.0	5.7
5/3/13	0.0069	0.0089	0.0114	0.0092	0.0074	*130*	*4.3*	*6.3*	*8.0*	*10.7*	*8.6*
9/30/13	0.001 **	0.001 **	0.001 **	0.0021	0.0025	86	0.41 **	0.47 **	0.46 **	1.6	1.9
3/20/14	0.0045	0.0058	0.0023	0.0025	0.0023	31	0.7	1.0	0.39	0.6	0.5
4/3/14	0.0046	0.0061	0.0044	0.0036	0.0034	38	0.8	1.3	0.90	1.1	1.0
4/17/14	0.0073	0.0072	0.0077	0.0059	0.0061	*143*	*5.0*	*5.6*	*5.9*	*7.5*	*7.8*
9/24/14	0.001 **	0.0028	0.001 **	0.0020	0.001 **	67	0.32 **	1.0	0.36 **	1.1	0.57 **

Notes:

Concentrations marked with ** were not detected and reported concentration is estimated and reported at 1/2 the detection limit. Load is calculated using this concentration.

1) Blanks indicate station was not sampled on designated date.
2) Load was calculated using the flow for the designated station and the flow relationship to the E-12A gage (see Appendix A). Loads calculated with flows greater than 100 cfs are flow driven and are italicized
3) Samples were not collected at E-3 due to unsafe ice/river access conditions.

Table 2-3
Eagle River Zinc Concentrations and Loads
2010 - 2014

Date	Dissolved Zinc Concentration [1] (mg/L)					Eagle River Flow (cfs) at E-12A	Zinc Load [1,2] (lbs/day)				
	E- 3	E-10	E-12A	E-15	E-22		E- 3	E-10	E-12A	E-15	E-22
3/6/10 [3]		0.167	0.198	0.169	0.168	18		18	19	19	18
3/17/10 [3]		0.405	0.243	0.178	0.188	23		54	30	28	29
4/2/10 [3]		0.132	0.248	0.195	0.224	31		23	42	45	52
4/15/2010	0.043	0.186	0.281	0.187	0.188	*123*	*25*	*125*	*187*	*204*	*205*
9/24/2010	0.010	0.070	0.103	0.080	0.080	41	2.0	16	23	26	26
3/7/11 [3]		0.159	0.206	0.197	0.145	32		29	36	47	35
3/21/2011	0.097	0.462	0.513	0.400	0.358	43	20	111	119	137	123
4/4/2011	0.105	0.341	0.674	0.589	0.371	66	33	124	240	329	207
4/18/2011	0.095	0.270	0.364	0.291	0.291	*119*	*54*	*176*	*234*	*307*	*307*
5/4/2011	0.083	0.282	0.337	0.215	0.272	96	38	148	175	181	228
10/11/2011	0.005 **	0.059	0.099	0.097		51	1.2 **	17	27	41	
3/12/12	0.026	0.230	0.316			25	3.1	33	43		
3/19/12			0.245			36			48		
3/26/12	0.025	0.131	0.158	0.120		85	10	61	73	88	
4/3/12			0.178			*116*			*111*		
4/10/12	0.029	0.040	0.064	0.055		*144*	*20*	*31*	*50*	*71*	
4/17/12			0.117			*103*			*65*		
10/18/12	0.010 **	0.047	0.095	0.057	0.055	28	1.3 **	7.6	14	12	11
3/12/13 [3]		0.113	0.166	0.121	0.110	9		6.6	8.2	3.2	2.9
3/22/13	0.010 **	0.157	0.129	0.140	0.129	12	0.6 **	12	8.4	7.5	6.9
4/5/13	0.105	0.231	0.288	0.243	0.222	38	19	49.43	59.10	72	66
4/19/13	0.067	0.223	0.445	0.377	0.231	33	11	42	79	94	58
5/3/13	0.154	0.235	0.370	0.266	0.215	*130*	*96*	*167*	*260*	*308*	*249*
9/30/13	0.010	0.028	0.041	0.033	0.035	86	4	13	19	24	26
3/20/14	0.043	0.259	0.197	0.196	0.176	31	6	46	33	45	41
4/3/14	0.059	0.306	0.342	0.251	0.220	38	11	65	70	74	65
4/17/14	0.101	0.209	0.248	0.171	0.168	*143*	*69*	*163*	*192*	*219*	*215*
9/24/14	0.005 **	0.038	0.032	0.032	0.040	67	1.6 **	14	12	18	23

Notes:

Concentrations marked with ** were not detected and reported concentration is estimated and reported at 1/2 the detection limit. Load is calculated using this concentration.

1) Blanks indicate station was not sampled on designated date.
2) Load was calculated using the flow for the designated station and the flow relationship to the E-12A gage (see Appendix A). Loads calculated with flows greater than 100 cfs are flow driven and are italicized
3) Samples were not collected at E-3 due to unsafe ice/river access conditions.

Table 2-4
Rock Creek Dissolved Metal Concentrations and Loads
2010 - 2014

Date	Total Arsenic[1] (mg/L)	Dissolved Metal Concentration[1] (mg/L)			Flow[2] (cfs)	Total Arsenic Load[3] (lbs/day)	Dissolved Metal Load[3] (lbs/day)		
		Cadmium	Copper	Zinc			Cadmium	Copper	Zinc
3/6/10	NA	0.0099	0.0078	5.45	0.11 *	NA	0.0059	0.005	3.2
3/17/10	NA	0.0067	0.0068	3.65	0.27 *	NA	0.0098	0.010	5.3
4/2/10	NA	0.0072	0.0034	2.87	0.45 *	NA	0.0175	0.008	7.0
4/15/10	NA	0.0202	0.0301	8.52	NM				
9/24/10	NA	0.0022	0.0028	1.160	0.09 *	NA	0.0011	0.001	0.6
3/7/11	NA	0.0105	0.0119	4.01	0.38	NA	0.0215	0.024	8.2
3/21/11	NA	0.0054	0.0107	2.42	0.66	NA	0.0192	0.038	8.6
4/4/11	NA	0.0061	0.0174	2.79	0.79	NA	0.0260	0.074	11.9
4/18/11	NA	0.0115	0.0370	4.85	0.79	NA	0.0491	0.158	20.7
5/4/11	NA	0.0038	0.0205	1.52	0.68	NA	0.0140	0.075	5.6
10/11/11	NA	0.0049	0.0039	2.56	0.37	NA	0.0098	0.008	5.1
3/12/12	NA	0.0031	0.0044	1.9	0.19 *	NA	0.0032	0.005	2.0
3/26/12	NA	0.0119	0.0225	6.22	0.28	NA	0.0180	0.034	9.4
4/10/12	NA	0.0046	0.0115	2.12	0.59 *	NA	0.0146	0.036	6.7
10/18/12	0.0023	0.0025	0.0026	1.53	0.16 *	0.002	0.0022	0.002	1.3
3/12/13	0.0018	0.0039	0.0023	2.65	0.13	0.001	0.0027	0.002	1.9
3/22/13	0.0015	0.0044	0.0040	2.61	0.02 *	0.0002	0.0005	0.000	0.32
4/5/13	0.0031	0.0032	0.0152	1.67	0.06 *	0.001	0.0010	0.005	0.52
4/19/13	0.0020	0.0072	0.0176	4.21	0.45	0.005	0.0175	0.043	10.2
5/3/13	0.0020	0.0144	0.0354	6.66	0.45	0.005	0.0350	0.086	16.2
9/30/13	0.0026	0.0029	0.0056	1.22	0.41 *	0.006	0.0064	0.012	2.7
3/20/14	0.0019	0.0029	0.0031	1.74	0.20 *	0.002	0.0031	0.003	1.9
4/3/14	0.0017	0.0031	0.0043	1.61	1.45	0.013	0.0243	0.034	12.6
4/17/14	0.0014	0.0054	0.0201	2.07	1.00	0.008	0.0292	0.109	11.2
9/24/14	0.0025	0.0028	0.0035	0.96	0.45	0.006	0.0068	0.009	2.3

Notes:

1) Concentrations marked with ** were not detected and reported concentration is estimated and reported at 1/2 the detection limit.
2) T-10 flow measured at the station or if marked with * estimated using a relationship with T-18 (using T-18 flow measured at USGS station 09065100 until July 2009). Flows after July 2009 are estimated using field measurements when conditions allowed. Comparisons to the T-18 relationship to estimated T-10 flows indicate the relationship has a high bias during dry years.
3) Load was calculated using the flow for the designated station and concentration presented in table. Loads marked with ** are based on estimated concentrations when metal was not detected.

Table 2-5
Cross Creek Dissolved Metal Concentrations and Loads
2010 - 2014

Date	Total Arsenic[1] (mg/L)	Dissolved Metal Concentration[1] (mg/L)			Flow[2] (cfs)	Total Arsenic Load[3] (lbs/day)	Dissolved Metal Load[3] (lbs/day)		
		Cadmium	Copper	Zinc			Cadmium	Copper	Zinc
3/6/10	NA	0.00005 **	0.0010	0.154	NM				
3/17/10	NA	0.00005 **	0.0010	0.184	NM				
4/2/10	NA	0.00005 **	0.0022	0.086	NM				
4/15/10	NA	0.00020	0.0036	0.072	73	NA	0.0788	1.42	28.5
9/24/10	NA	0.00043	0.0057	0.123	12	NA	0.0272	0.36	7.8
3/7/11	NA	0.00015	0.0051	0.118	4	NA	0.0032	0.11	2.5
3/21/11	NA	0.00024	0.0040	0.128	7	NA	0.0096	0.16	5.1
4/4/11	NA	0.00005 **	0.0041	0.104	19	NA	0.0051 **	0.42	10.7
4/18/11	NA	0.00018	0.0058	0.076	22	NA	0.0214	0.69	9.1
5/4/11	NA	0.00005 **	0.0021	0.055	17	NA	0.0046 **	0.19	5.0
10/11/11	NA	0.00020	0.0038	0.090	15	NA	0.0162	0.31	7.3
3/12/12	NA	0.0002	0.001 **	0.173	5	NA	0.0044	0.028 **	4.8
3/26/12	NA	0.00005 **	0.0023	0.038	16	NA	0.0043 **	0.199	3.3
4/10/12	NA	0.00005 **	0.0028	0.0265	36	NA	0.0097 **	0.544	5.2
10/18/12	0.00010 **	0.00005 **	0.001 **	0.0567	11	0.0059 **	0.0030 **	0.059 **	3.4
3/12/13	0.00010 **	0.00011	0.001 **	0.1820	3	0.0015 **	0.0017	0.015 **	2.8
3/22/13	0.00020 **	0.00010 **	0.002 **	0.1200	3	0.0029 **	0.0015 **	0.029 **	1.7
4/5/13	0.00027	0.00011	0.0023	0.0799	6	0.0090 **	0.0037	0.077	2.7
4/19/13	0.00010 **	0.00005 **	0.0021	0.0726	5	0.0024 **	0.0012 **	0.051	1.8
5/3/13	0.00010 **	0.00011	0.0044	0.0551	31	0.017 **	0.0184	0.737	9.2
9/30/13	0.00010 **	0.00005	0.0038	0.0189	42	0.023 **	0.0113	0.862	4.3
3/20/14	0.00051	0.00005	0.0025	0.0640	5.7	0.016 **	0.0015	0.08	2.0
4/3/14	0.00010 **	0.00005	0.0010	0.0497	7.8	0.0042 **	0.0021	0.04	2.1
4/17/14	0.00025	0.00005	0.0027	0.0348	28	0.038 **	0.0076	0.41	5.3
9/24/14	0.00010 **	0.00005 **	0.0035	0.0202	29	0.016 **	0.0078	0.55	3.2

Notes:

1) Concentrations marked with ** were not detected and reported concentration is estimated and reported at 1/2 the detection limit.

2) T-18 flow measured at USGS station 09065100. Flows from August 2009 through November 2010 (when the gage was not operating) are estimated on day of sampling. Flows during ice over could not be estimated with accuracy and are not reported.

3) Load was calculated using the flow for the designated station and concentration presented in table. Loads marked with ** are based on estimated concentrations when metal was not detected.

Table 2-6
Zinc Loading Summary
2010 - 2014

Date	Eagle River Flow (cfs) at E-12A	Zinc Loading for Eagle River (lbs/day) [1]							
		Segment 2 (Background)	Upper Segment 5a (Belden)	Lower Segment 5a (Rock Creek)			Segment 5b		
				Entire Segment	Rock Creek Load	Without Rock Creek Load	Entire Segment	Cross Creek Load	Without Cross Creek Load
3/6/2010	18	NM	18	1.5	3.2	-1.7	-0.74	NM	NA
3/17/2010	23	NM	54	-24	5.3	-29	-2.4	NM	NA
4/2/2010	31	NM	23	18	7.0	11	3.6	NM	NA
4/15/2010	123	25	100	62	NM	NA	18	29	-11
9/24/2010	41	2.0	14	6.7	0.6	6.1	3.3	7.8	-4.5
3/7/2011	32	NM	29	6.7	8.2	-1.5	12	2.5	9.3
3/21/2011	43	20	91	7.8	8.6	-0.8	18	5.1	13
4/4/2011	66	33	91	116	12	104	89	11	78
4/18/2011	119	54	122	58	21	38	73	9.1	64
5/4/2011	96	38	111	26	5.6	21	5.8	5.0	0.8
10/11/2011	47	1.2	16	10	5.1	5.4	13	7.3	6.1
3/12/2012	25	3.1	30	10	2.0	7.6	NM	4.8	NM
3/26/2012	85	10	51	11	9.4	1.9	16	3.3	12.6
4/10/2012	144	20	12	19	6.7	12	21	5.2	16
10/18/2012	28	1.3	6.3	6.8	1.3	5.5	-2.9	3.4	-6.3
3/12/2013	9	NM	6.6	1.6	1.9	-0.3	-5.0	2.8	-7.7
3/22/2013	12	0.6	11	-3.2	0.32	-3.6	-0.9	1.7	-2.6
4/5/2013	38	19	30	9.7	0.52	9.1	13	2.7	10
4/19/2013	33	11	31	38	10.2	27	15	1.8	13
5/3/2013	130	96	71	93	16.2	77	48	9.2	39
9/30/2013	86	4.1	9.3	5.5	2.7	2.8	5.3	4.3	1.1
3/20/2014	31	6.3	39	-13	1.9	-15	12	2.0	10
4/3/2014	38	11	55	4.7	13	-7.9	4.3	2.1	2.2
4/17/2014	143	69	94	29	11	17	27	5.3	22
9/24/2014	67	1.6	12	-2.2	2.3	-4.5	6.7	3.2	3.5

Notes:

1) Individual zinc loads are presented on Table 2-3 for the Eagle River stations and Tables 2-4 and 2-5 for the tributary stations Rock Creek (T-10) and Cross Creek (T-18), respectively. Zinc Loading for a segment is calculated using the stations listed below.

Segment 2 or Background is the measured load at E-3.

Upper Segment 5a or Belden is the load measured at E-10 minus the background load (E-3).

Lower Segment 5a is the load measured at E-12A minus the load measured at E-10. When the Rock Creek load (T-10) is removed, the remaining gain/loss is from unaccounted sources.

Segment 5b is the load measured at E-15 minus the load measured at E-12A. When the Cross Creek load (T-18) is removed, the remaining gain/loss is from unaccounted sources and the WTP (which is typically small approximately 0.2 lbs/day).

NM - Not Measured

NA - Not applicable - if a tributary load could not be measured, it as not applicable to present the Segment load "without" the tributary.

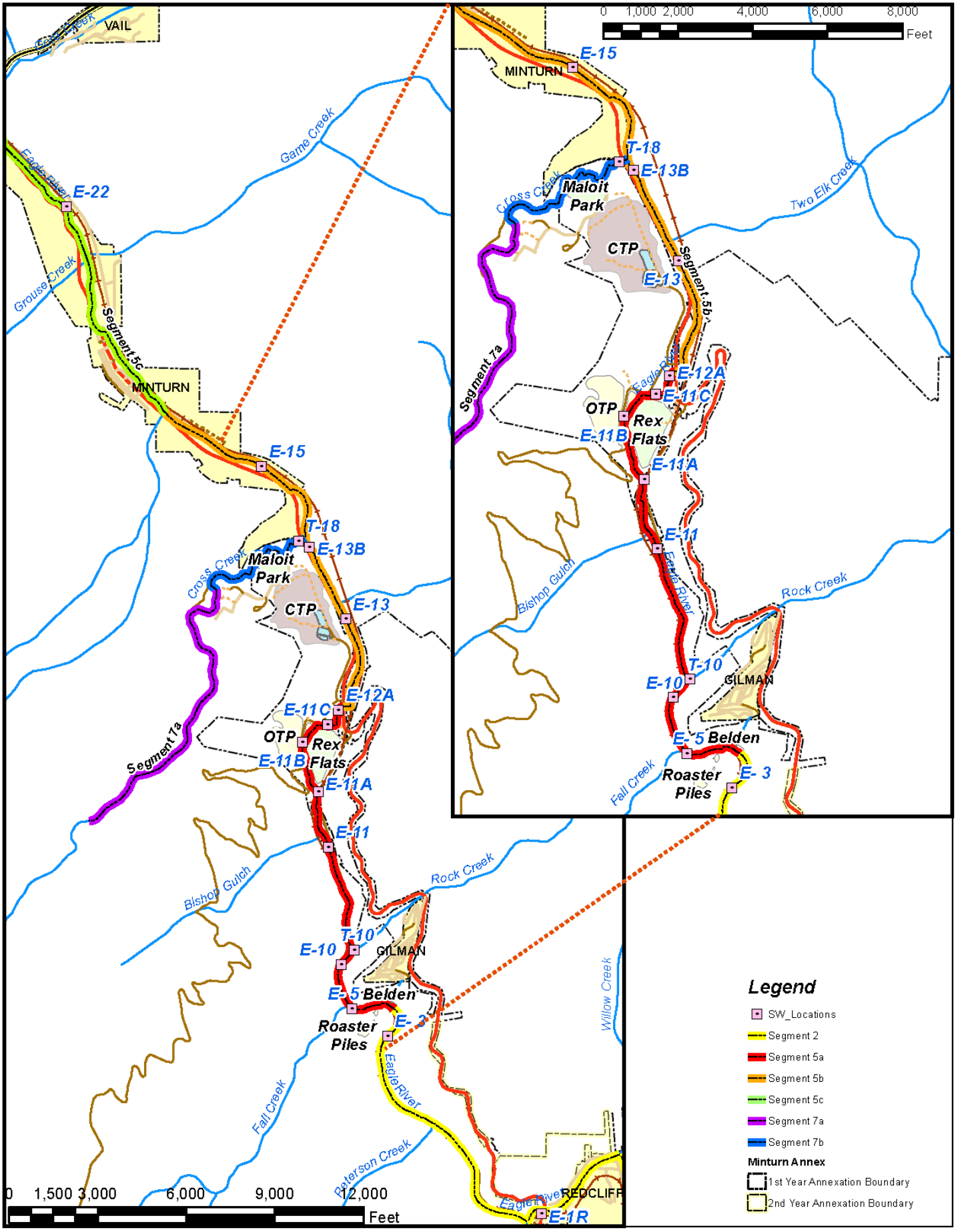
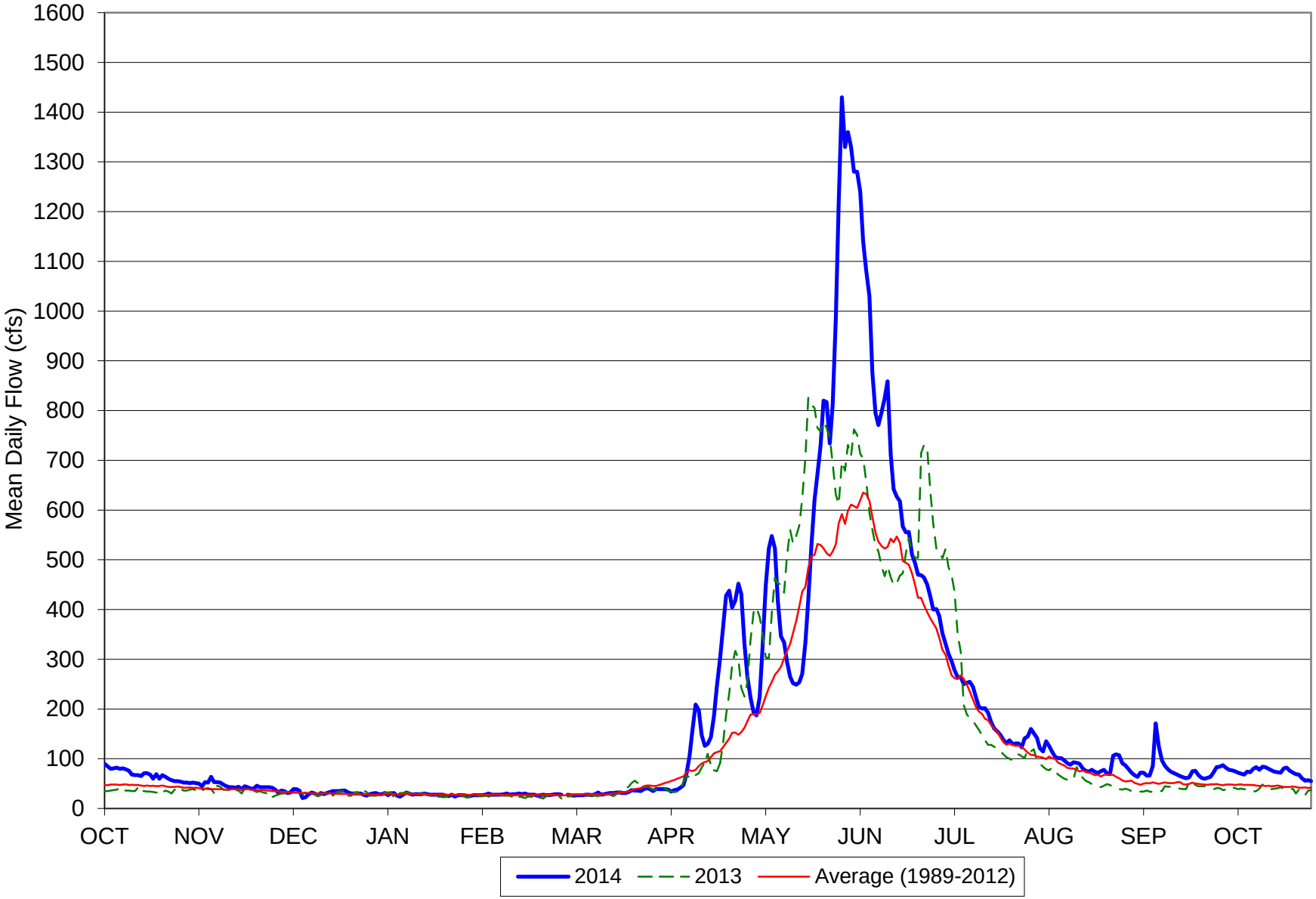


Figure 2-1 Surface Water Monitoring Locations and Eagle River Basin Segments

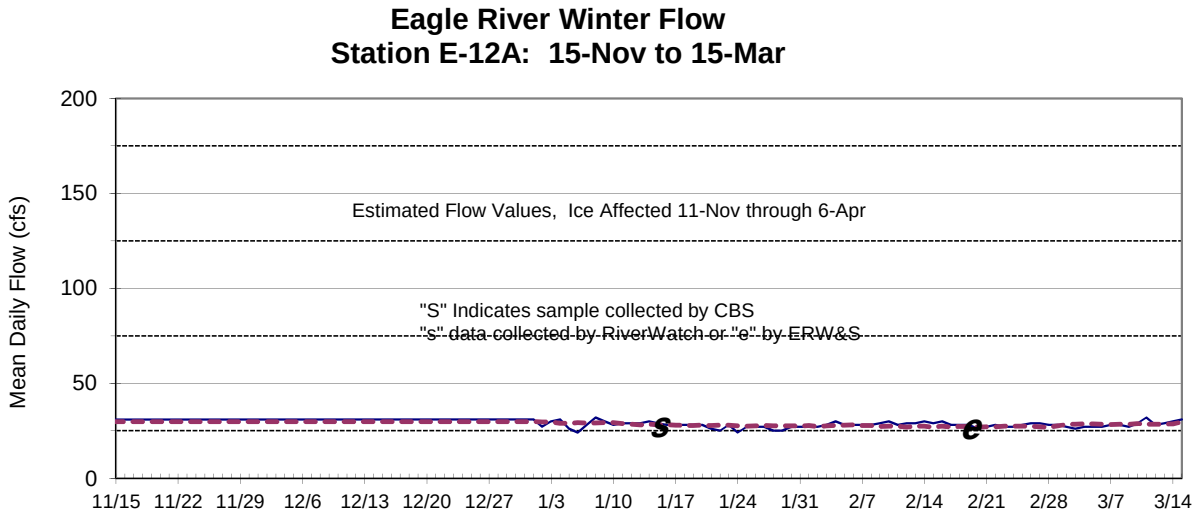
Eagle River Mean Daily Flow
Station E-12A: 2014 vs 2013 vs Average

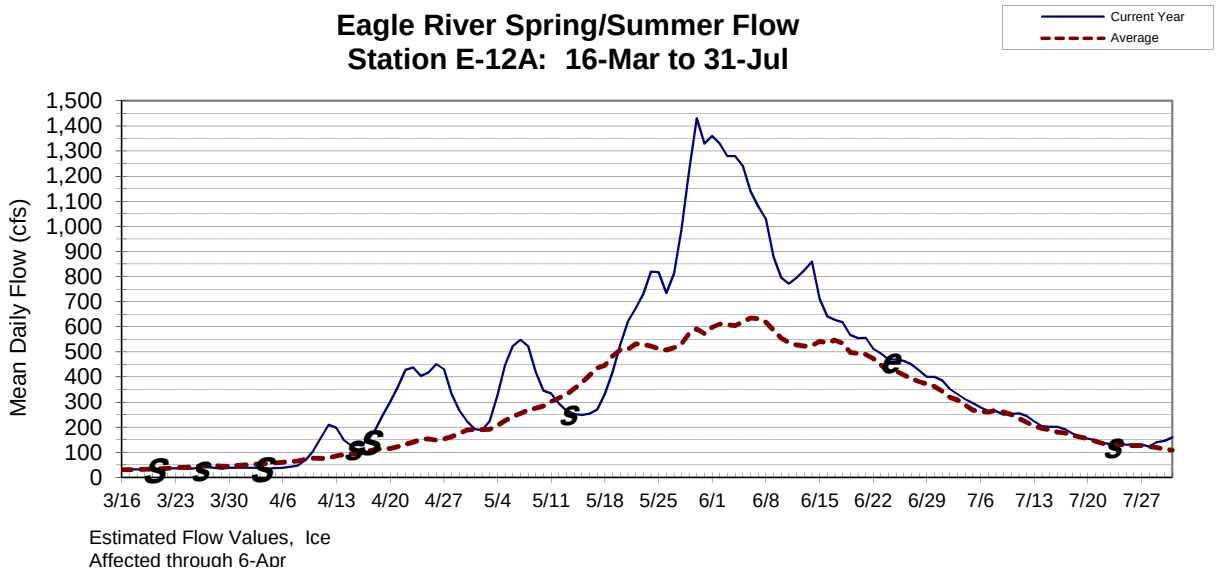


Source: USGS station 09064600 accessed at http://waterdata.usgs.gov/co/nwis

Figure 2-2

Eagle River Flow by Season at Station E-12A





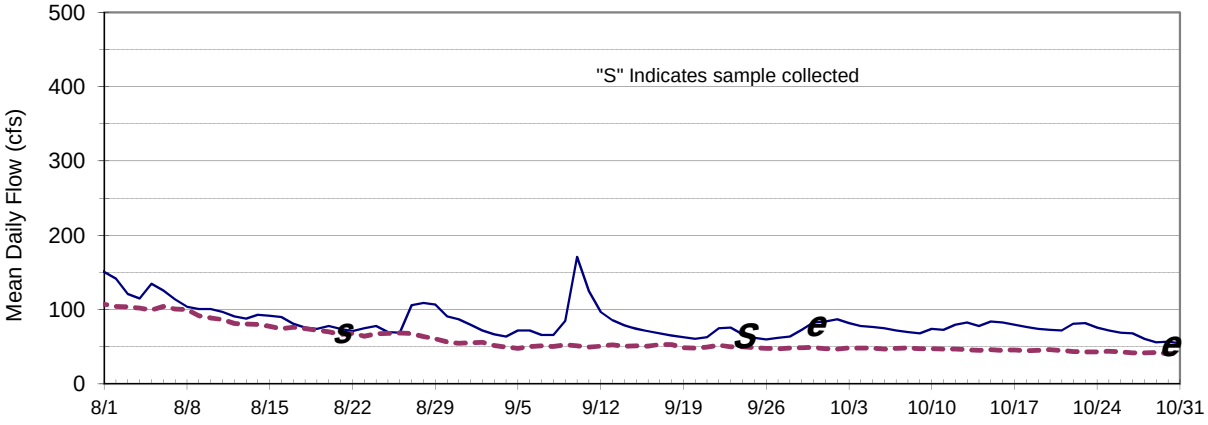
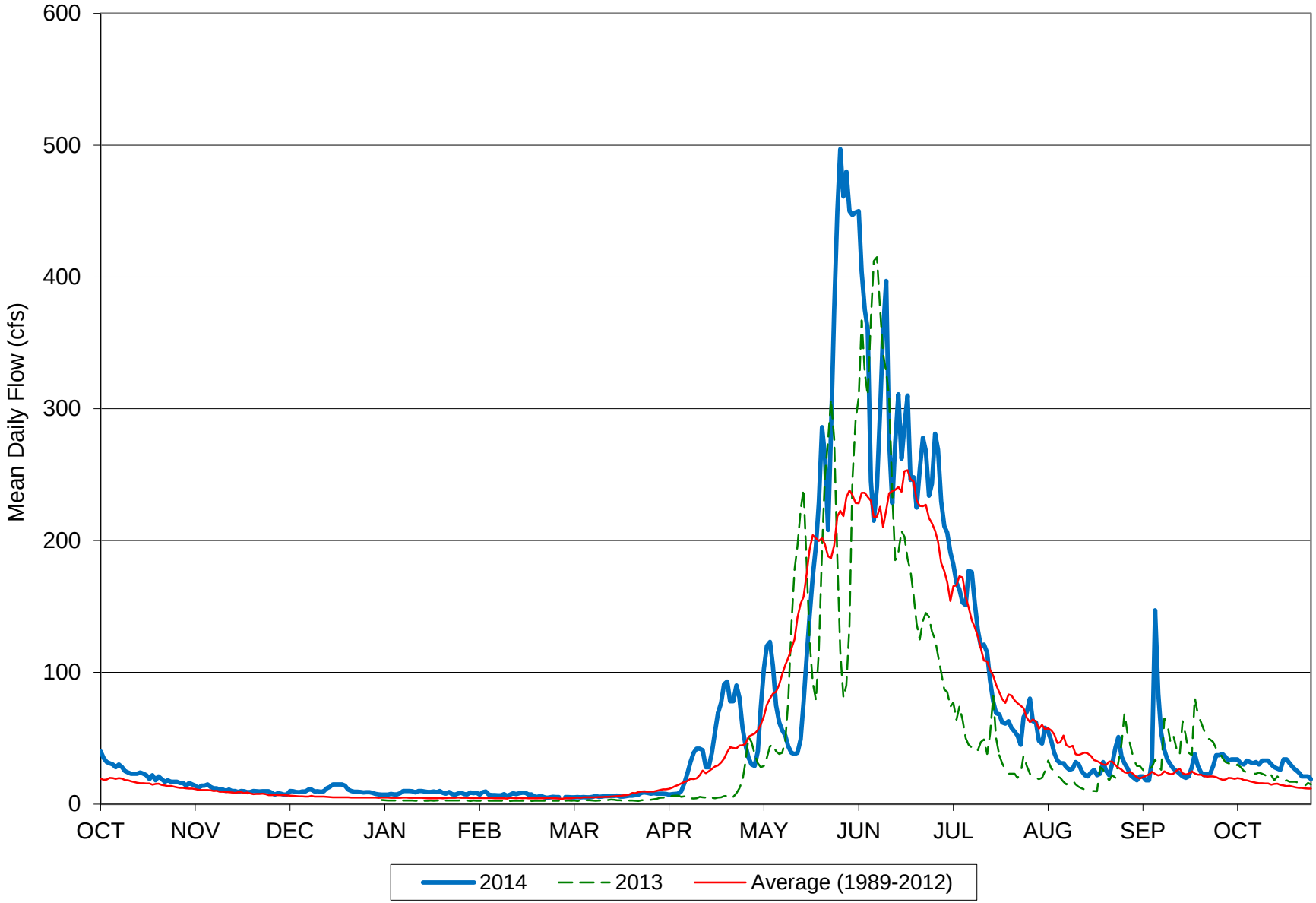


Figure 2-3

Cross Creek Mean Daily Flow
Station T-18: 2014 vs 2013 vs Average



Source: USGS station 09065100 accessed at http://waterdata.usgs.gov/co/nwis

Figure 2-4

Eagle River Seasonal Water Quality
Dissolved Zinc: Oct-2013 to Oct-2014

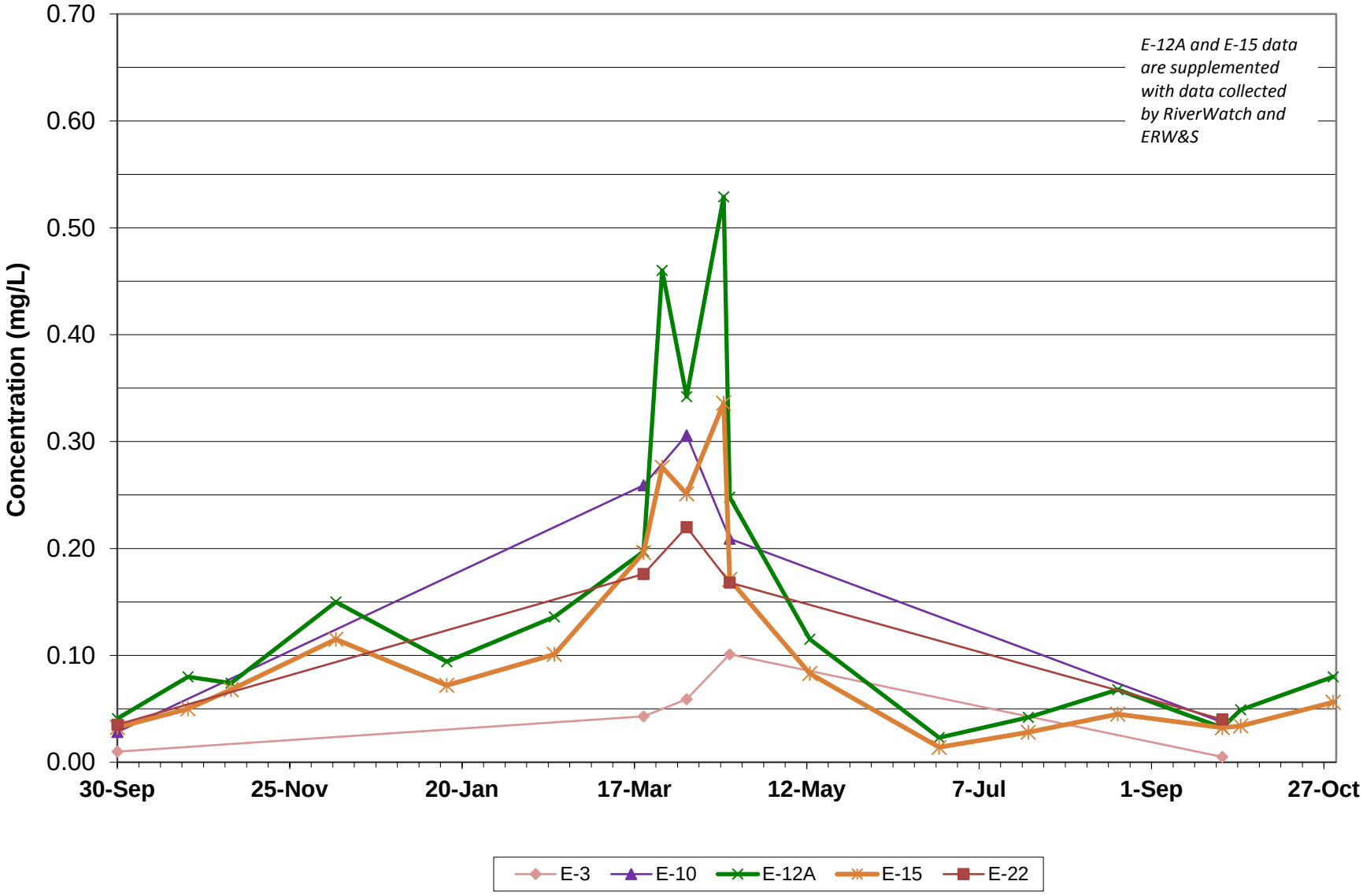


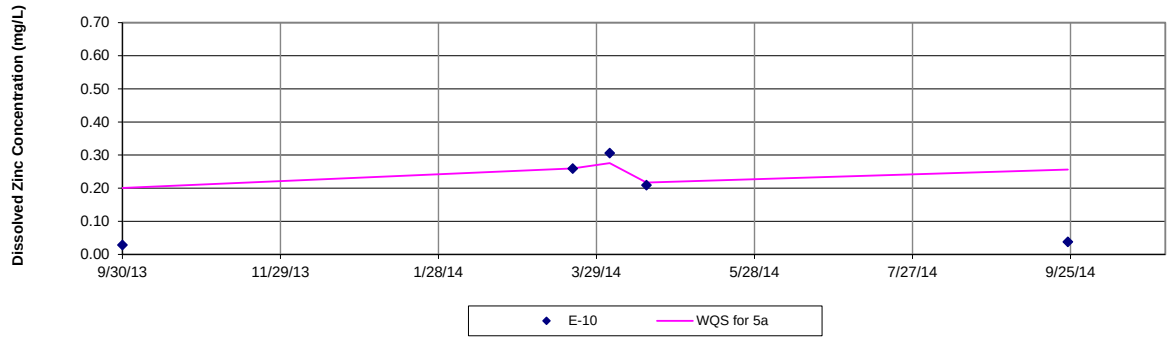
Figure 2-5

Dissolved Zinc Concentrations in Eagle River Segment 5

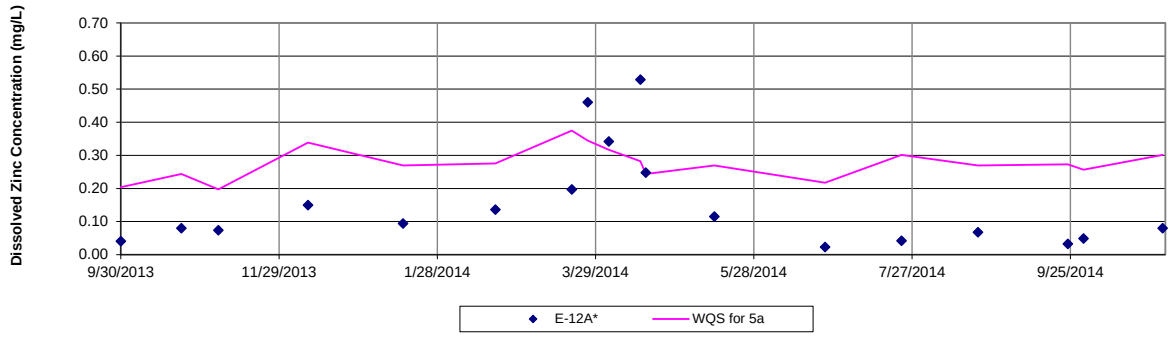
WQS are based on equations found in Table 3 of CCR 33, effective 1/1/2009 and were calculated using the hardness of the corresponding sample.

Segment 5a

E-10



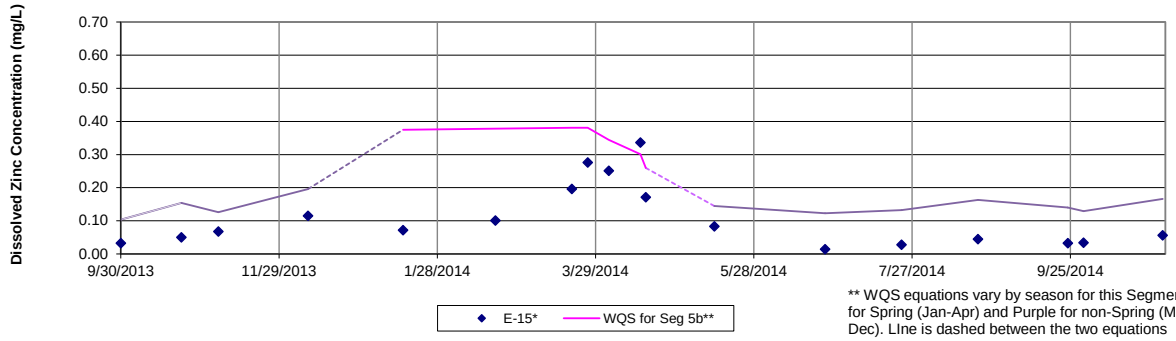
E-12A



**E-12A and E-15 data are supplemented with data collected by RiverWatch and ERW&S*

Segment 5b

E-15



** WQS equations vary by season for this Segment - Pink for Spring (Jan-Apr) and Purple for non-Spring (May-Dec). LIne is dashed between the two equations

Segment 5c

E-22

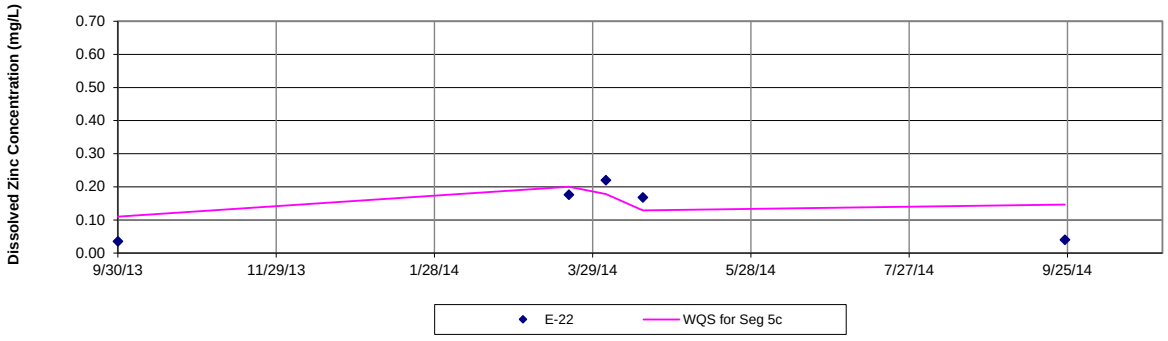
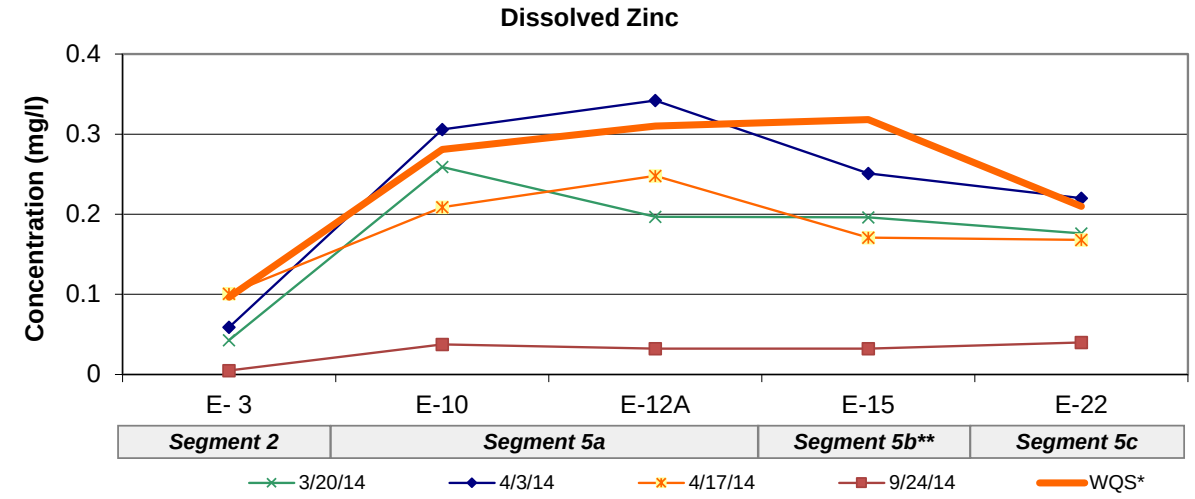
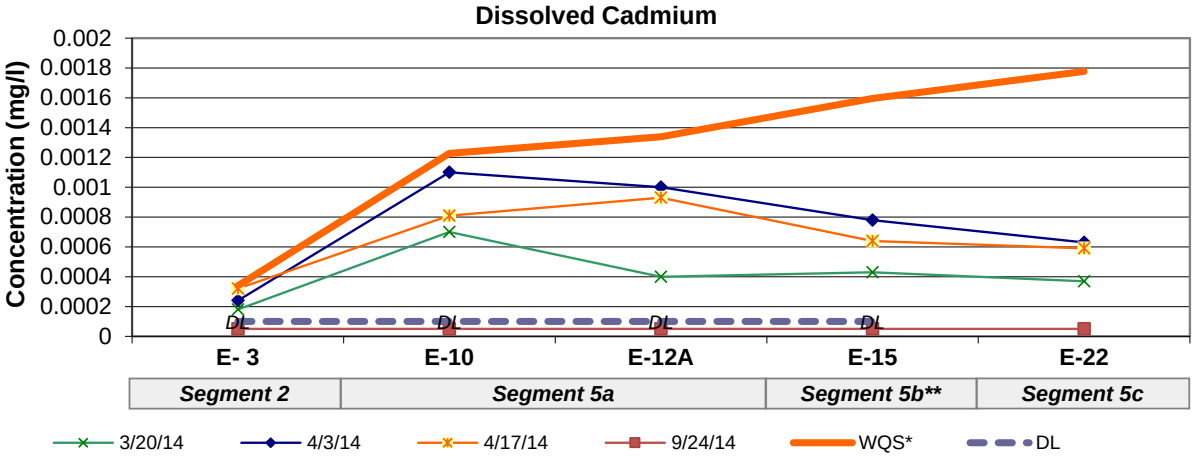
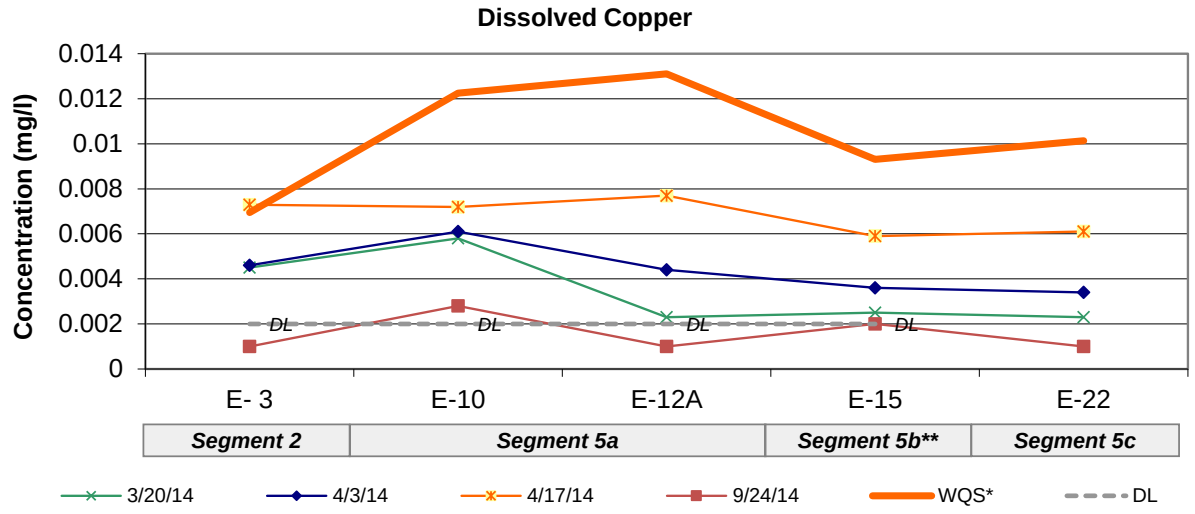


Figure 2-6

Comparisons of Dissolved Zinc, Cadmium, and Copper in the Eagle River to Chronic Ambient Water Quality Standards







* Average Hardness for each station was calculated using data from 2009-2012 and used in WQS calculation; equations vary by Segment.

** WQS for dissolved zinc shown for Segment 5b is the January-April WQS as this is appropriate comparison for all but September's sample. See Figure 2-6 for comparison of individual samples to the seasonal standards.

Figure 2-7

Dissolved Zinc Concentration
Station T-10: Rock Creek

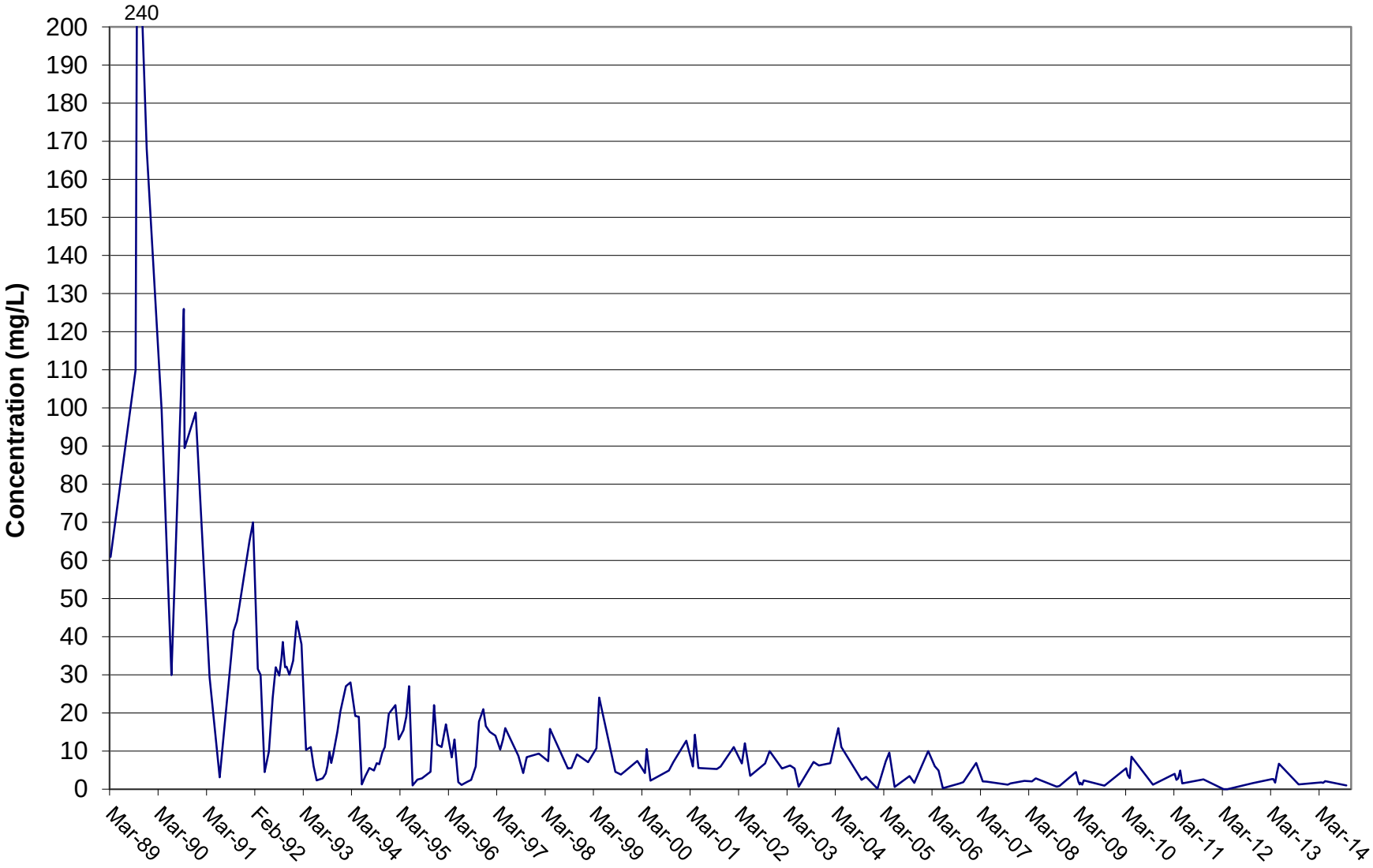


Figure 2-8

Dissolved Zinc Concentration
Station T-18: Cross Creek

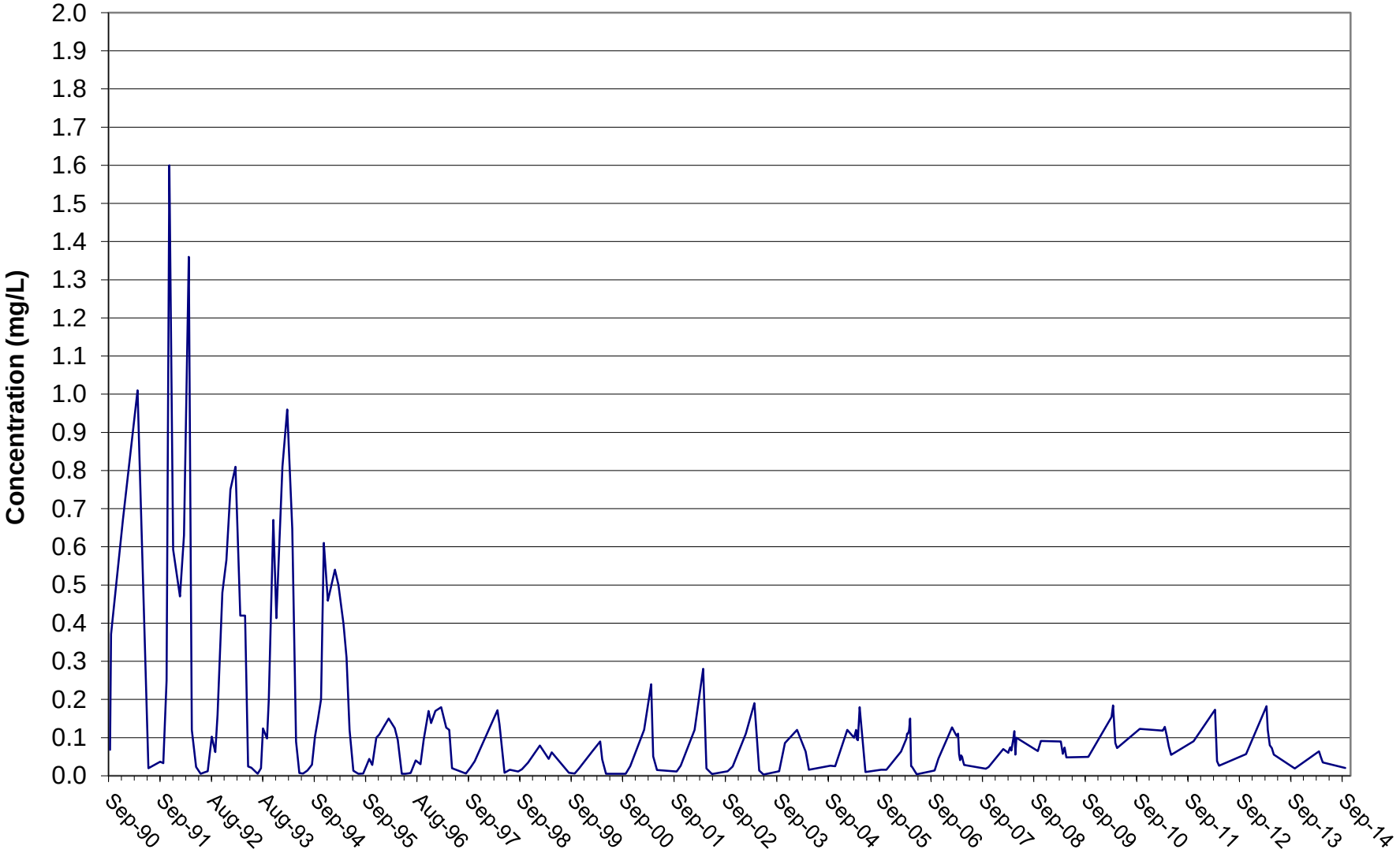
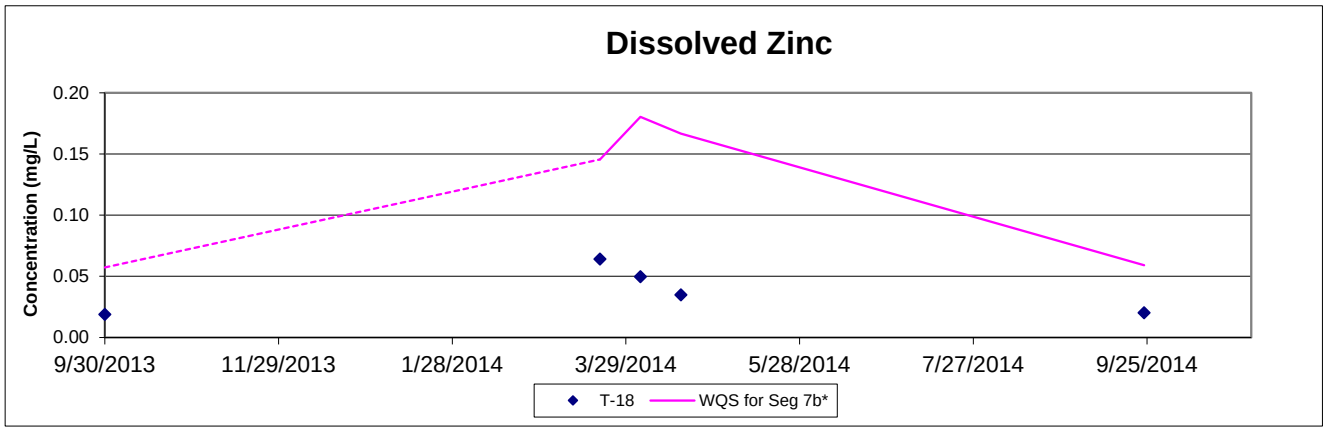


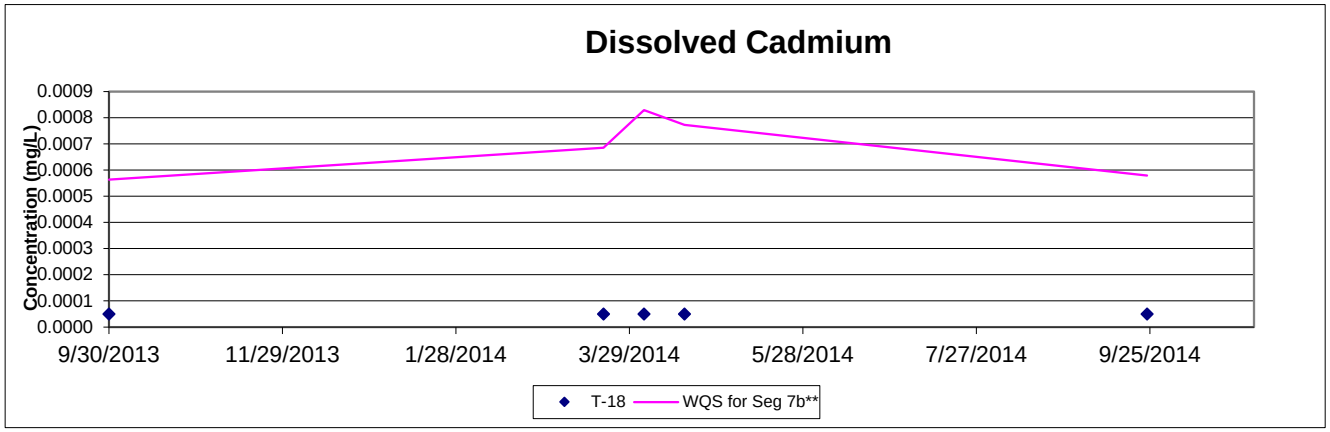
Figure 2-9

Dissolved Zinc, Cadmium, and Copper Concentrations in Cross Creek, Segment 7b

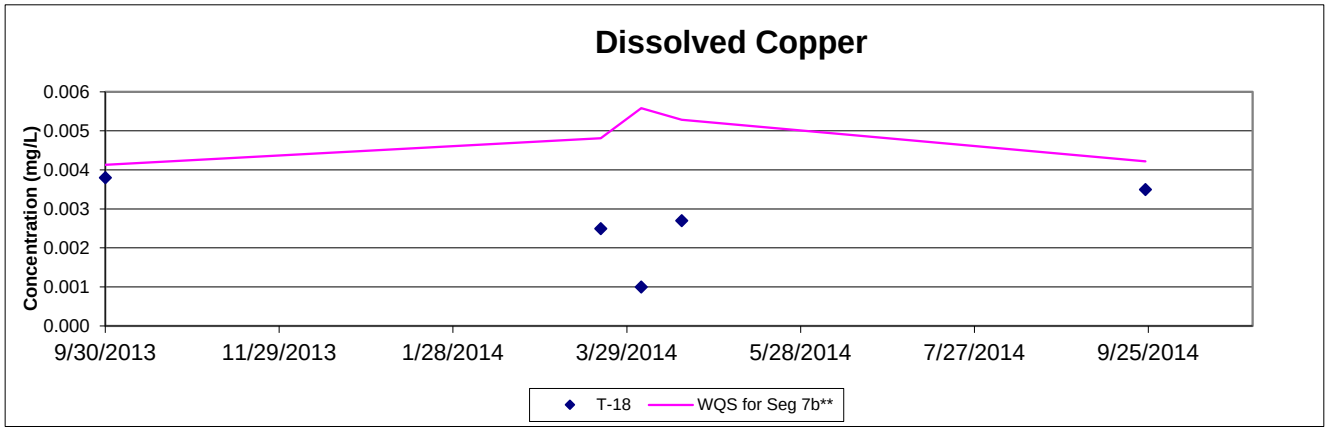
Segment 7b - Cross Creek



* All WQSs are based on equations found in Table 3 of CCR 33, effective 1/1/2009 and were calculated using the hardness of the sample. WQS equations vary by season for this Segment - Pink for Spring (Jan-Apr) and Purple for non-Spring (May-Dec). LIne is dashed between the two equations



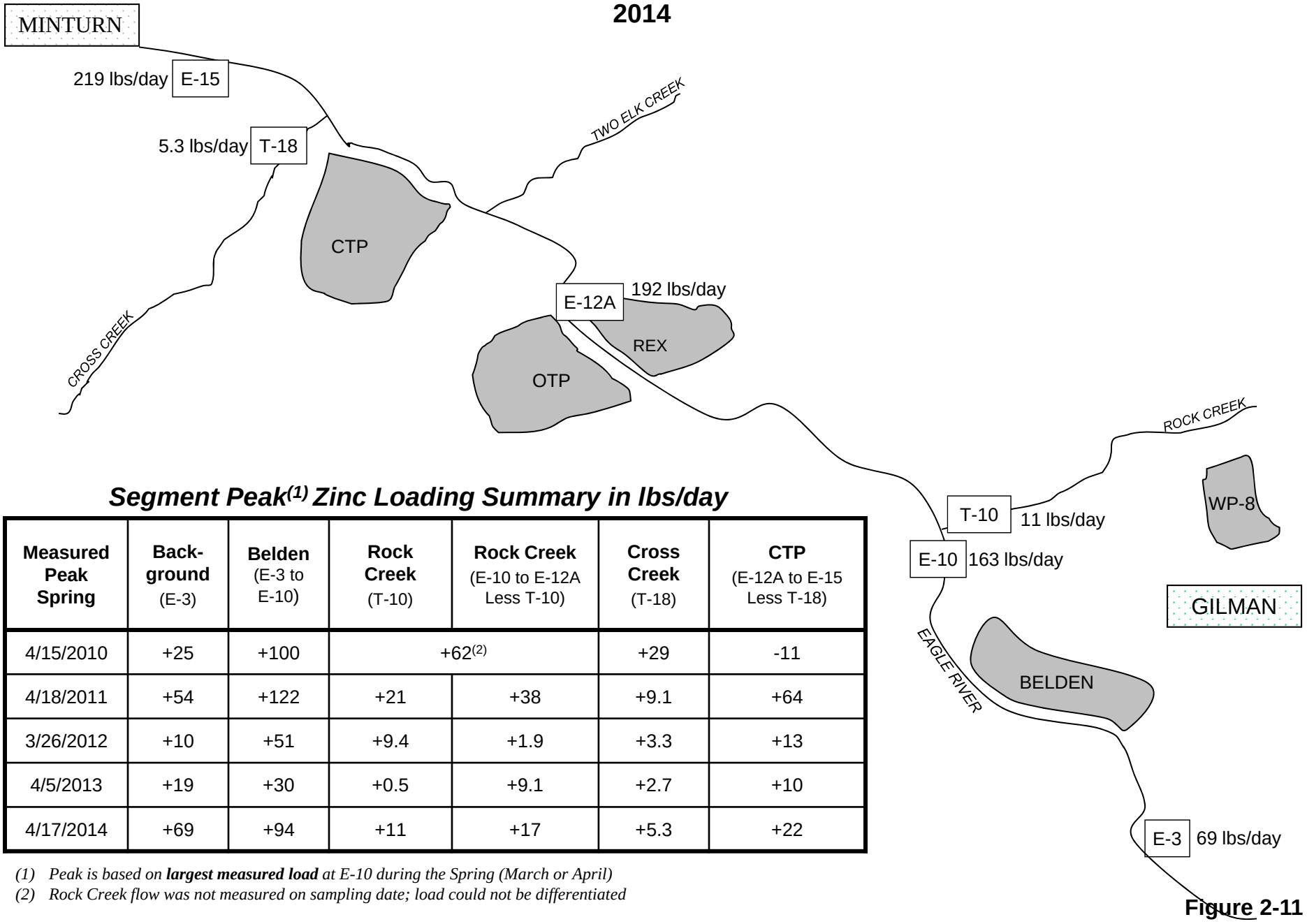
** All WQS are based on equations found in Table 3 of CCR 33, effective 1/1/2009 and were calculated using the hardness of the sample.



** All WQS are based on equations found in Table 3 of CCR 33, effective 1/1/2009 and were calculated using the hardness of the sample.

Figure 2-10

ZINC PEAK LOADING
2014



Segment Peak(1) Zinc Loading Summary in lbs/day

Measured Peak Spring	**Back-ground** (E-3)	**Belden** (E-3 to E-10)	**Rock Creek** (T-10)	**Rock Creek** (E-10 to E-12A Less T-10)	**Cross Creek** (T-18)	**CTP** (E-12A to E-15 Less T-18)
4/15/2010	+25	+100	+62(2)		+29	-11
4/18/2011	+54	+122	+21	+38	+9.1	+64
3/26/2012	+10	+51	+9.4	+1.9	+3.3	+13
4/5/2013	+19	+30	+0.5	+9.1	+2.7	+10
4/17/2014	+69	+94	+11	+17	+5.3	+22

*(1) Peak is based on **largest measured load** at E-10 during the Spring (March or April)*
(2) Rock Creek flow was not measured on sampling date; load could not be differentiated

Figure 2-11

3.0 EAGLE MINE WATER MONITORING AND DATA SUMMARY

Eagle Mine water monitoring activities conducted in 2014 included the following:

- Measuring mine water levels
- Collecting mine water samples
- Monitoring mine seepage flow.
- Pumping the Mill Level seepage.

These monitoring activities and related data are summarized in this section. Activities conducted at the Liberty No. 4 well, which intercepts clean water prior to flowing into the Eagle Mine, are also summarized in this section.

3.1 Mine Water Levels

The mine pool level was measured in the Wilkesbarre shaft in Gilman until 1998. Beginning in July 1998 and continuing until 2002, the mine water level was measured from a reference point set in the Bleakhouse Mine workings (elevation 8503.8 ft MSL). Since 1992, mine water has been released at the Adit No. 5 bulkhead and gravity drained through a pipeline to the WTP for treatment (the MDD). Since 2002, the mine water levels have been monitored using a pressure transducer in the MDD pipeline. The Wilkesbarre shaft is not deep enough to access mine pool levels below 8498 ft MSL. Graphical representations of the mine pool level for 1992 through 2014 and for 2013 and 2014 are presented in Figure 3-1.

For the year the mine pool elevation rose approximately 9.23 feet, from 8458.05 ft MSL on December 31, 2013 to 8467.28 ft MSL on December 26, 2014.

3.2 Mine Water Sampling

In the 1990s, mine pool seepage through rock fractures was a significant source of metals, especially in the Rock Creek drainage where the flooded workings of the Bleakhouse Mine were leaking through highly fractured Cambrian quartzite. Mine pool seepage ceased to be a major source of metal loading since the inception of the MDD program and control of the mine pool level below 8500 ft MSL. Operational history has demonstrated that as long as the elevation of the mine pool is maintained below 8500 ft MSL, most of the seeps are under control.

Mine water has been historically sampled directly from the mine pool via the Wilkesbarre shaft, from the bulkhead valve in Adit 5, and from the MDD at the Rock Creek vault. During the year, the MDD was sampled three times as part of a treatment plant siting study, the results ranged from between 18 and 79 mg/L for dissolved zinc. Comparisons

to previous samples (see Figure 3-2 for zinc) indicate that the 2014 results for zinc are not atypical for the mine pool.

3.3 Eagle Mine Seeps

The Eagle Mine began filling with water in 1984 when the mine dewatering pumps were turned off. The mine filled and eventually began leaking water in the Rock Creek area in September 1989. Subsequently, monitoring stations were established. Since 1990, seepage has been collected and piped to the WTP for treatment. Seepage stations are shown on Figure 3-3: Flow at collected seeps S-5 (Adit 5 bulkhead), S-6 (Adit 6 bulkhead), and S-TT (Tip Top bulkhead) is typically monitoring on a daily or weekly basis, unless access is difficult in the winter. These seeps were sampled in 2014 as part of a treatment plant siting study. Sample results are presented in Appendix B.

3.4 Mill Level Seeps

In the spring, melting ice and snow collects in the mine workings that house the underground mill between the Newhouse level (8483 ft MSL) and the Copper Tipple Loading Tunnel (8397 ft MSL) or about 40 feet topographically above the Eagle River. When the mine and mill were operating, water that accumulated in the Mill Level was pumped out for treatment. At present, the so-called Mill Level water picks up elevated metal concentrations due to contact with ore and concentrates in the underground mill. Once the Mill Level water reaches its maximum level of 10 inches or so, it leaks outside the mine through old pipelines, fractures in the bedrock, and two tunnels that serviced the mill, the Loading Tipple and the Service Incline. Mill Level seepage probably recharges the shallow groundwater in the Copper Tipple Trench area. A dedicated electric sump pump on the Mill level was used to dewater the Mill Level pool over the period between April -August. A total of 63,000 gallons was pumped to the treatment plant. No samples of Mill Level water were collected in 2014.

3.5 Liberty No. 4 Well

Since 1990, investigations have been conducted by CBS to identify means to reduce inflow to the Eagle Mine, thereby allowing better control of the mine pool level and, eventually, reduce flow to the WTP. From these investigations, it was concluded that the most feasible method to reduce recharge to the mine is to stop or reduce flow entering on the 19 Level, via exploratory drift 19-5-E-3. It has been estimated that 200 gpm or more of fresh water continuously recharges the drift via core holes drilled horizontally from the tunnel into the Leadville Dolomite. To intercept flow in the 19-5-E-3 drift, a well (Liberty No. 4 or LIB-4) was installed in the drift in July 1998.

On September 1, 1999, EPA issued an Explanation of Significant Differences (ESD) describing EPA's decision regarding this mine pool component of the remedy for the Site. The ESD, which is an addition to the 1993 Record of Decision, required installation of a pumping system at the Liberty No. 4 well. After delays due to securing an easement for power and pump problems, the Liberty No. 4 well began pumping on October 30, 2001. A timeline for late 2013 to early 2015 is presented below:

- New pump and motor 11/16/2013 – pump rate 142 gpm
- Pump rate turned up 3/20/2014 – 177 gpm
- Power outage - 5/6-5/15/2014
- Power outage – 6/11-6/16/2014
- Power outage 8/20-8/26/2014
- Pump motor shorted out in power surge – 10/8/2014
- New motor installed 11/11/2014 – pumping rate 201 gpm
- Power out with freeze – 11/13/2014
- Pump restarted 12/10/2014 – pumping rate 201 gpm
- Power out 12/22/2014 – pump off during equipment upgrades
- Pump restarted 1/28/2015 – pumping rate 200 gpm

Water samples, field parameters, and flow measurements are taken in accordance with CDPHE Permit Nos. COG-600000 and CO-0048952. CDPHE phased out the general "MINDI" permit COG-600000 and replaced it with Individual Permit CO-0048952 in October. As part of the CO-0048952 permit application, samples were collected on March 6, 2014 to provide additional data characterizing the well discharge and Willow Creek upstream of the well.

Discharge from the well is measured by a totalizing flow meter in the pump house. In 2014, approximately 69,884,200 gallons were pumped from the Liberty No. 4 well to Willow Creek. Field parameters and sample results are provided in Appendix B. All permit requirements were met.

.

Figure 3-1 Eagle Mine Water Level

Figure 3-2 Adit #5 Zinc Concentrations, (MS-5 or MDD) 1992 to 2014

Figure 3-3 Approximate Mine Seep/Adit Locations

Eagle Mine Water Level

(measured in the Bleakhouse tunnel)

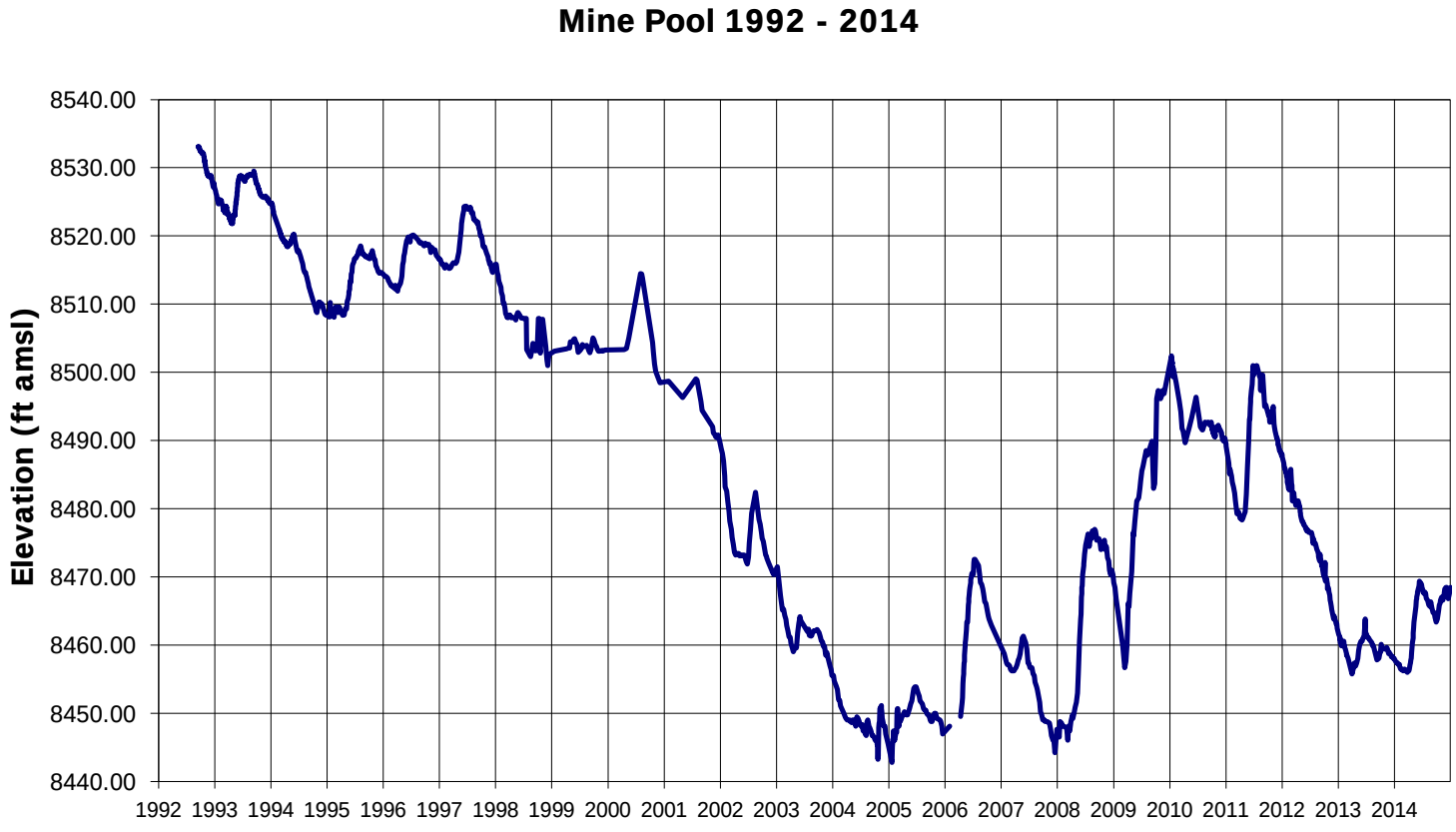
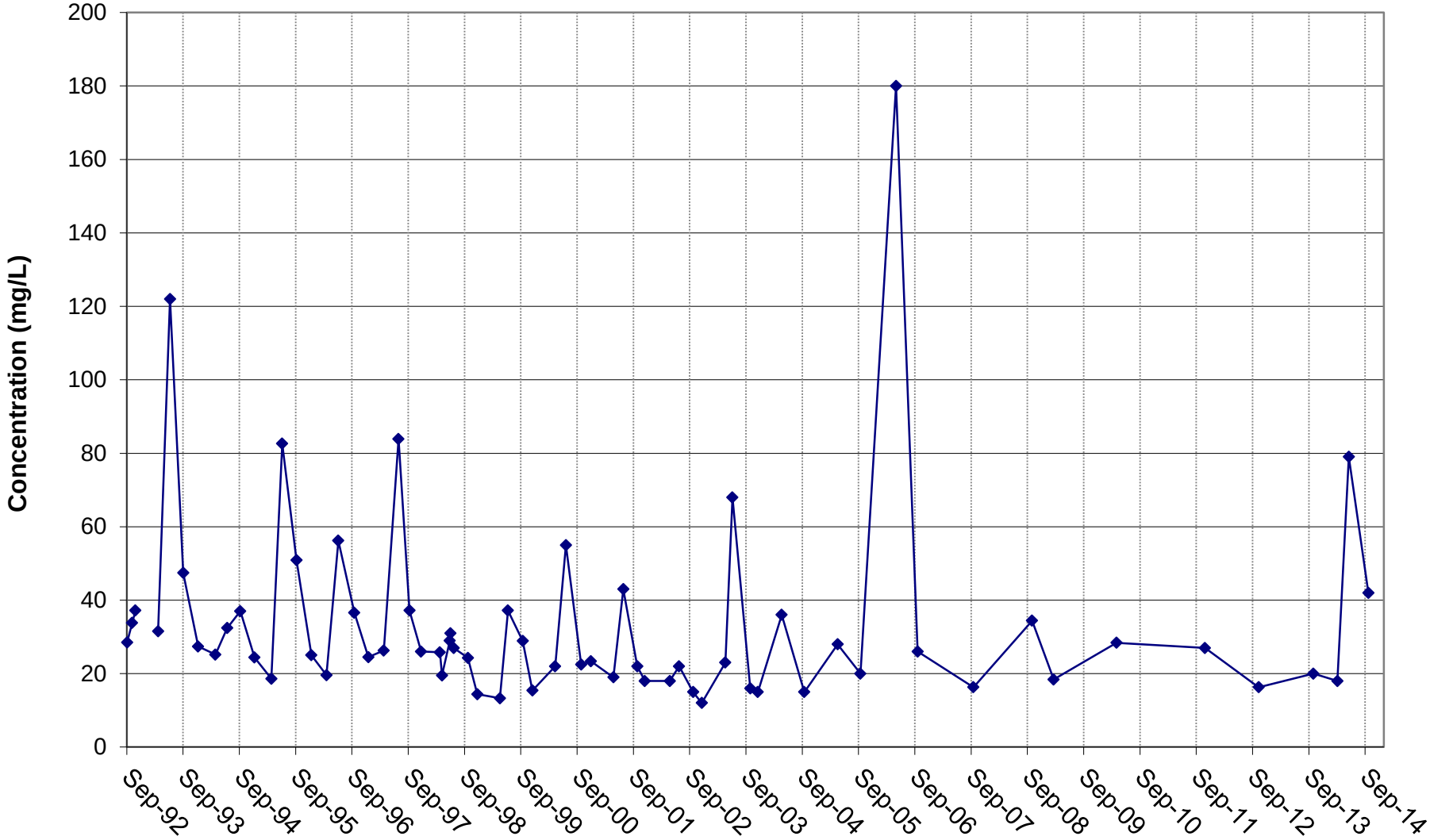


Figure 3-1

Adit #5 Zinc Concentrations[(1)] (MS-5 or MDD) 1992 to 2014



[(1)] Dissolved zinc except for 2011 and 2012 measurements; monitoring in 2013-14 by Golder indicates zinc concentrations are primarily in the dissolved phase.

Figure 3-2

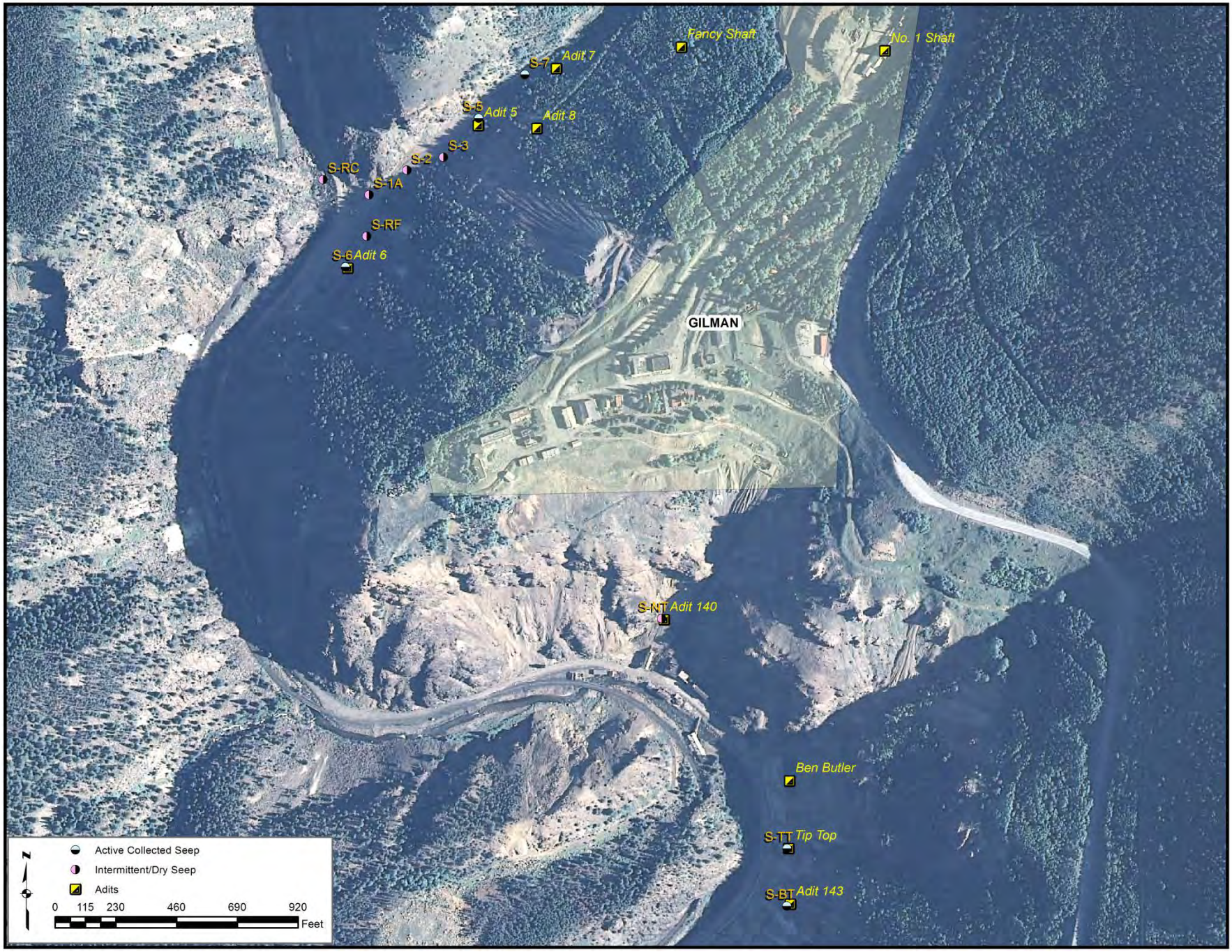


Figure 3-3 Approximate Mine Seep/Adit Locations

4.0 GROUNDWATER MONITORING AND DATA SUMMARY

Section 4 presents an historical background of the groundwater monitoring activities conducted at the Site and a summary of the 2014 groundwater quality data. Also discussed in this section are the groundwater extraction and diversion systems that were operated in 2014. The Rock Creek groundwater extraction system (siphon) is discussed with the Rock Creek groundwater in Section 4.2. Section 4.3 presents the operation summary of the upgradient groundwater diversion trench (UGDT) at the CTP. Section 4.4 presents the operation summary of the CTP groundwater extraction trenches.

4.1 Belden Area

Several years of water level measurements in seven Belden area monitoring wells indicate that the water table rises in the spring in response to recharge from snowmelt. This rise in the local water table in the Belden area is commensurate with a seasonal increase in the zinc concentration in the Belden reach of the river.

Based on recent sampling, groundwater in the Belden area is moderately acidic (pH range 2.8 to 5.8) and contains elevated concentrations of sulfate, zinc, and other metals leached from sulfide minerals within undifferentiated mineralized source materials in the area and from seepage from the Mill Level of the Eagle Mine.

In 2006, CBS and NewFields proposed to meet the anticipated WQS in Segment 5a by extracting and treating groundwater in Belden. System performance reports (NewFields 2007a, 2007b, 2007c; and 2008a) document data collected from Belden wells and the as-built information for the groundwater collection trench constructed in 2007 (this trench is referred to as the Copper Tipple Trench). Figure 4-1 presents the location of the Belden groundwater wells and the Copper Tipple Trench. This year the groundwater pulse in the Copper Tipple Trench was recorded in the BTS-1 well by an increase in water levels from late February to late March. The trench and well are typically dry and overall, the groundwater level rose almost 8 feet in the collection trench (Figure 4-2).

As documented in *Focused Feasibility Study, Eagle Mine Site* (NewFields 2013b), Belden groundwater represented by samples from BTS-1, BW-10 and other wells contains up to 979 mg/L zinc compared to 20 mg/L in the MDD mine water. Well BW-10 was sampled four times as part of a new treatment plant siting study. The average measured dissolved zinc concentration of 895 mg/L is consistent with previous measurements from this well and the Belden area. The 2014 analytical results and field measurements are provided in Appendix B.

Water levels were collected in the Copper Tipple Trench access (BTS-1) to calibrate the HOBO water level transducer and to monitor water levels after the transducer was

removed (see Figure 4-2). Water levels in nearby Belden monitoring wells were also gaged. The 2014 water elevations (non-HOBO) are provided in Appendix C.

4.2 Rock Creek

Groundwater within Rock Creek canyon colluvium, also called baseflow, is a source of metal loading to Segment 5a downstream from station E-10. No groundwater samples were collected from the Rock Creek wells during 2014.

A groundwater extraction system consisting of four, 4-inch diameter wells was installed at a narrow bedrock constriction in lower Rock Creek Canyon near Seep S-2 in October 1992. These extraction wells are spaced approximately 15 feet apart and are approximately 15 feet deep with the well bottom in granite. A gravity siphon was installed in one extraction well (RX-3) on June 23, 1993 that removes approximately 1 gpm. The RX-3 siphon did not operate during 2014 despite several attempts to restart it. The siphon will be restarted in 2015. The EDS-3 pumping well at the base of Rock Creek operated at approximately 10 gpm during April and May 2014.

4.3 CTP Upgradient Groundwater Diversion Trench (UGDT)

The UGDT was originally installed in the late 1980s, but its use was discontinued in 1990 due to elevated metal concentrations in the discharge. Section 9.0 of the CD/SOW required an analysis of the need to reactivate or reconstruct the UGDT. CBS requested reopening the UGDT in 1997 because the CTP cap was complete and water quality of the groundwater in the nearby DT wells was good. In March 1999, CDPHE and EPA agreed that operation of the UGDT benefited the reestablishment of wetland vegetation in Maloit Park and increased the efficiency of the north groundwater extraction trench. The UGDT has flowed seasonally since that time.

The UGDT outfall was flowing at approximately 13.2 gpm by late-April 2014 and flowed through the summer. The UGDT was dry by mid-August 2014.

4.4 CTP Groundwater Extraction

Two extraction trenches at the CTP intercept groundwater and route it to the WTP surge ponds for treatment. The combined flow from the east groundwater extraction trench and north groundwater extraction trench is measured at the surge ponds by a totalizing meter. Run times are recorded for each of the pumps.

The average combined daily flow rates of the two trenches were greatly reduced in late 2012 and early 2013 compared to previous years. Partial pipeline blockages were identified and the force main and east trench collection pipe were jetted in 2013 and

2014. With the replacement of the east trench surface plumbing and jetting in September 2014 the flow rate to the Upper Pond increased to 130 gpm. Annual production of both trenches was approximately 10,958,000 gallons or about 2.5 million gallons more than in 2013. The 2014 production from the trenches represents approximately 11 percent of the total amount treated at the WTP in 2014. The total monthly production is provided in Appendix C.

Water levels at the east trench are monitored in well ET-1 to assess the effectiveness of pipe cleaning and pumping. An ET-1 water level profile is included as Figure 4-3. High water levels in this well in the Spring are not unusual due to significant recharge from snowmelt. However, the water level rise indicated the east trench piping needed maintenance and this work was completed in September.

The dissolved zinc concentration in the groundwater collected by the trenches has leveled off in recent years as depicted in Figure 4-4. In 2014, several water samples from the trench sumps were collected as part of a new treatment plant siting study. The analytical results and field measurements are provided in Appendix B

Water levels from ET-1 are manually measured on a weekly basis to calibrate the HOBO water level transducer when in the well and to bridge the period between transducer placements. The 2014 water elevations (non-HOBO) are provided in Appendix C.

Figure 4-1 Belden Area Groundwater Well Locations

Figure 4-2 2014 Water Levels, Belden Area

Figure 4-3 East Trench Monitoring Well ET-1 Water Levels

Figure 4-4 Dissolved Zinc Concentrations, CTP Trench Area

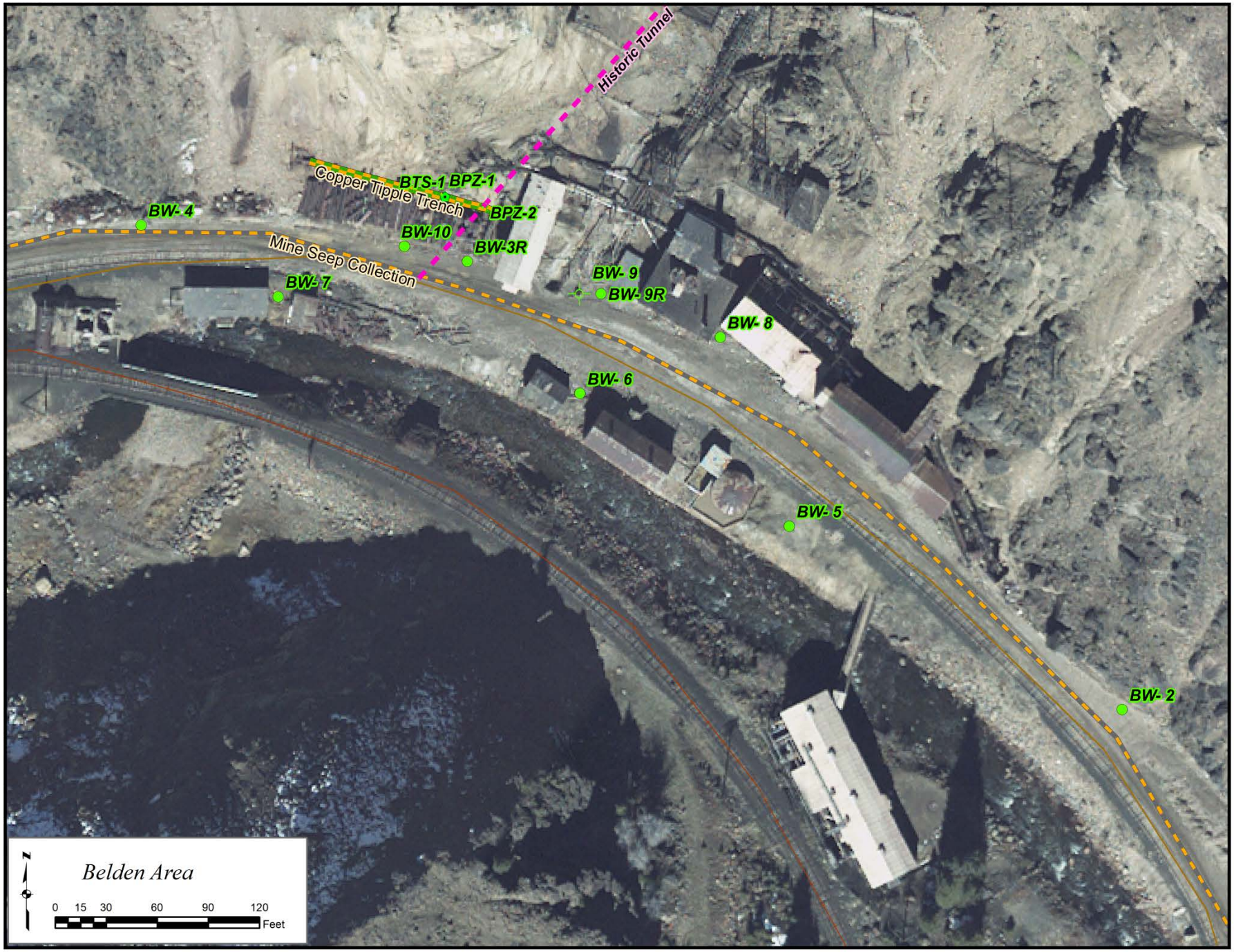
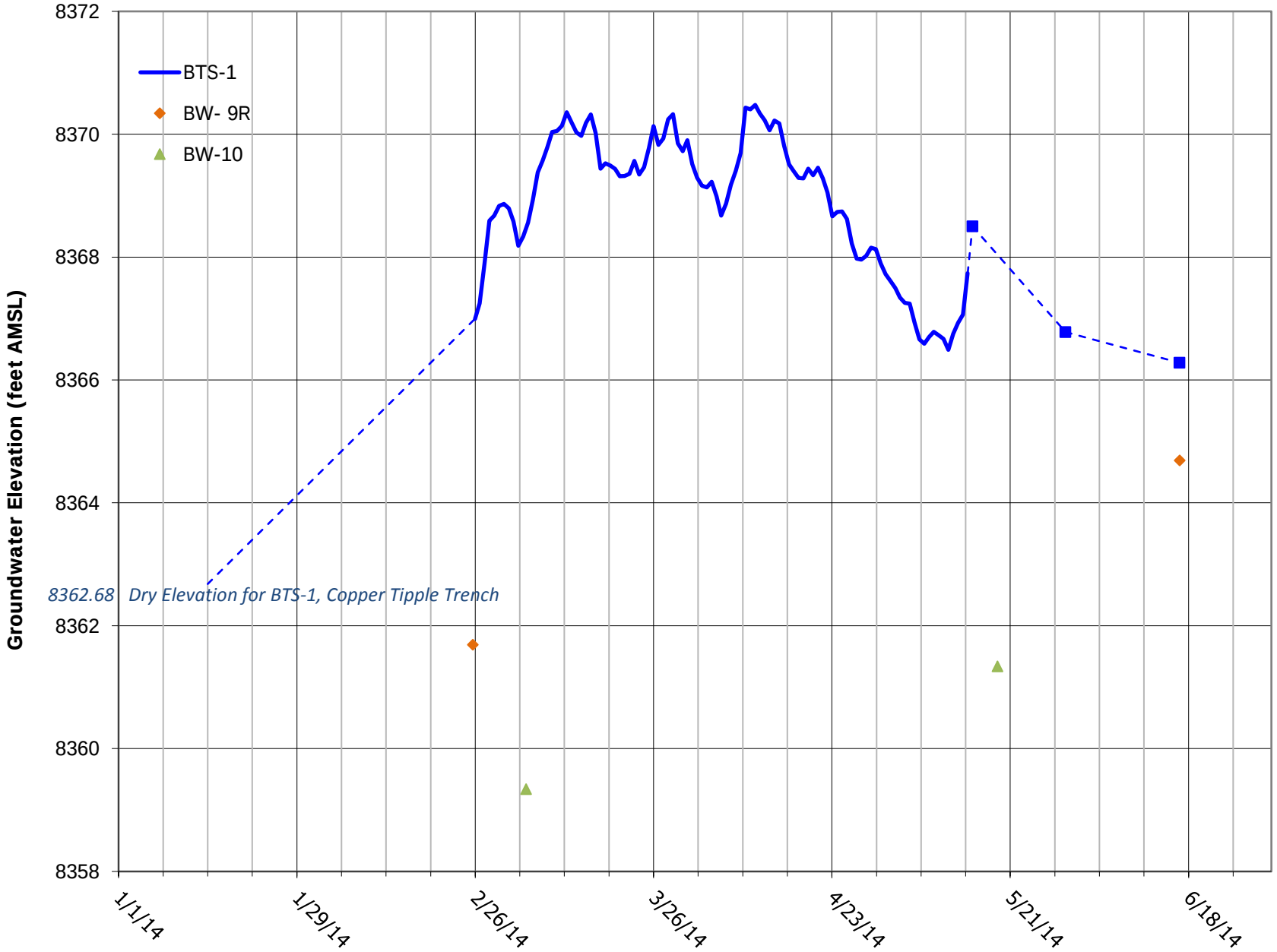


Figure 4-1 Belden Area Groundwater Well Locations

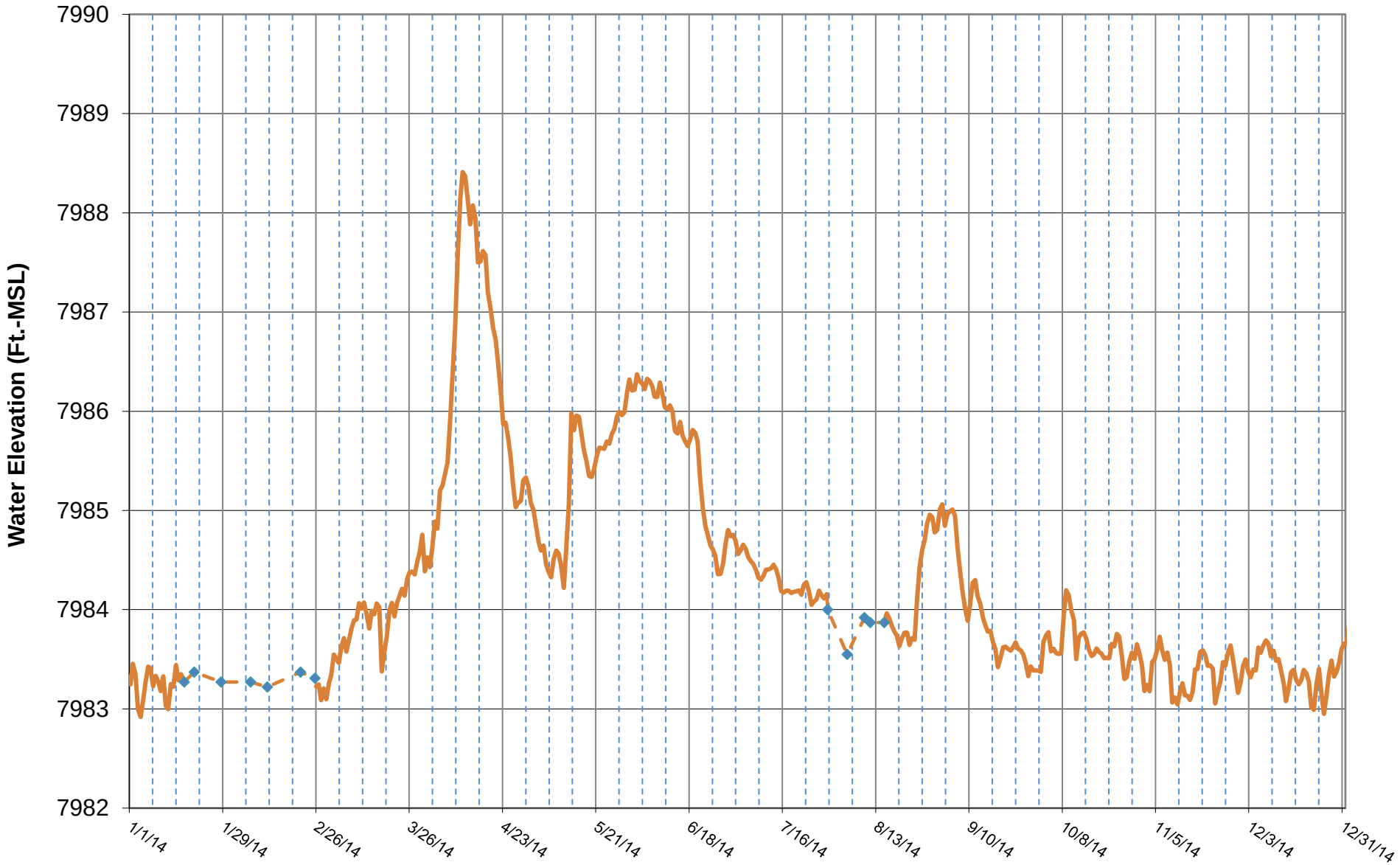
2014 Water Levels, Belden Area



HOBO water levels (solid line) are not corrected for daily barometeric changes

Figure 4-2

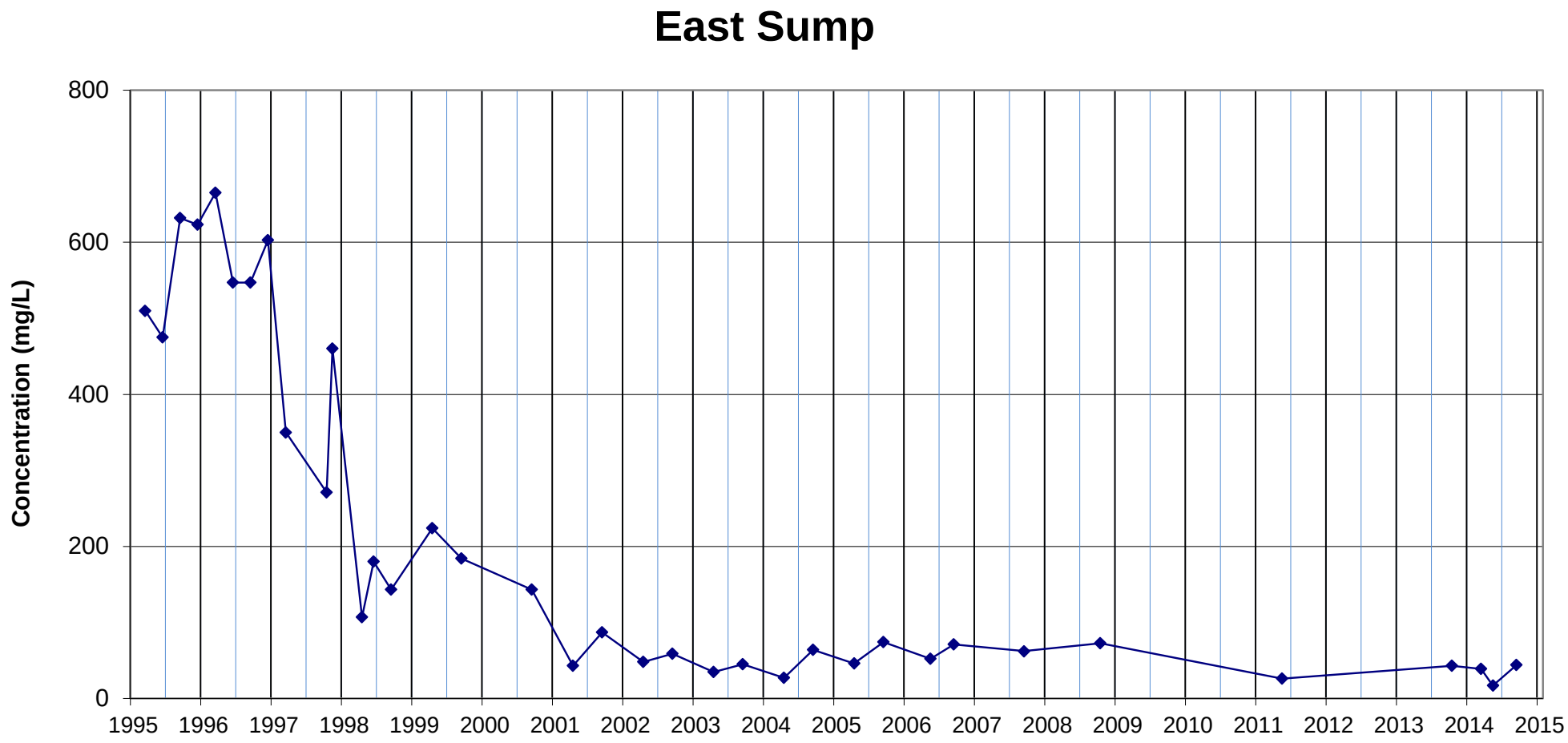
East Trench Monitoring Well ET-1 Water Levels



solid line measured by water level pressure transducer (HOBO) and dashed line by water level meter
HOBO measurement are not corrected for atmospheric pressure but rather calibrated to the water level meter

Figure 4-3

Dissolved Zinc Concentrations
CTP Trench Area



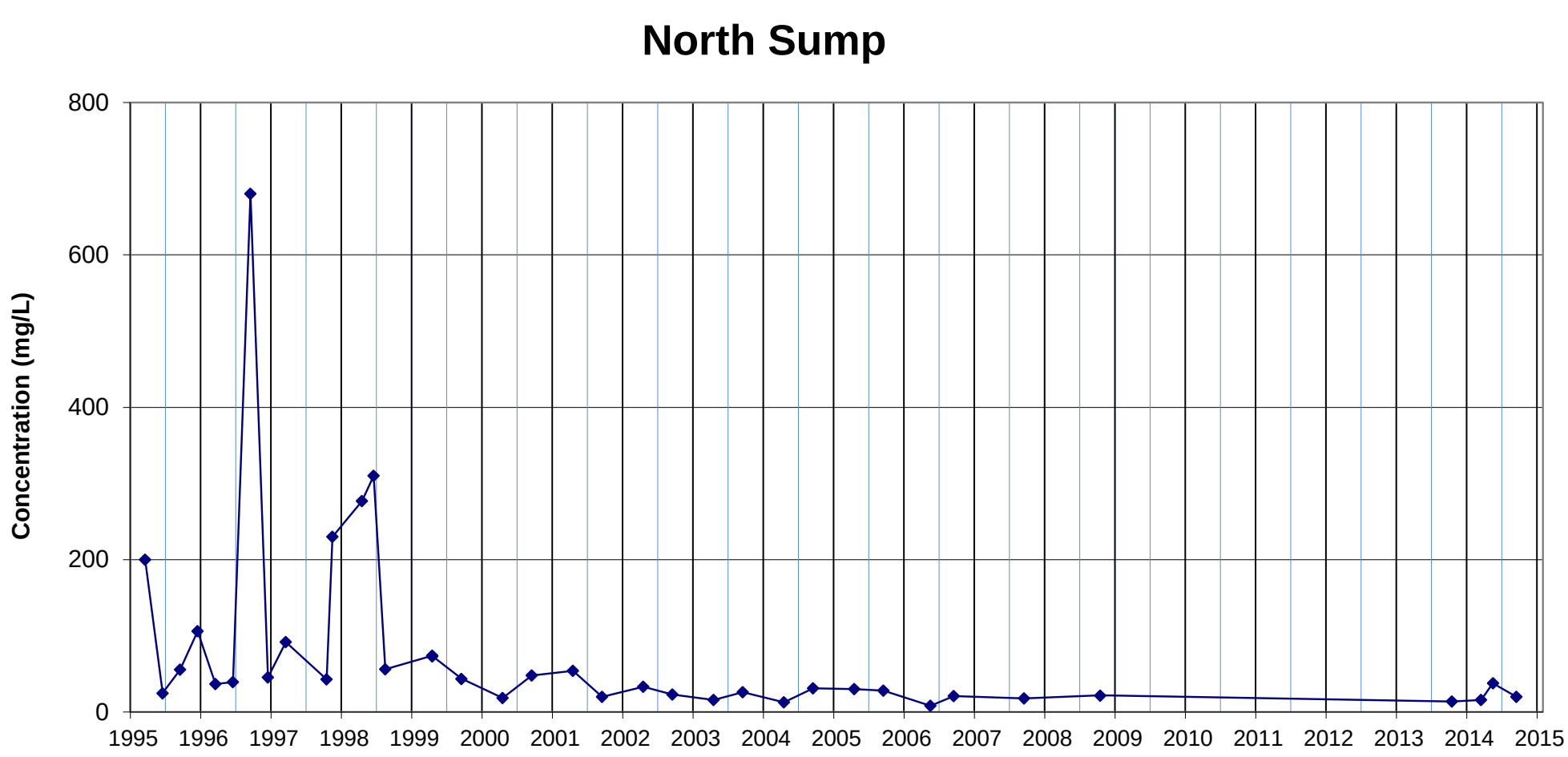


Figure 4-4

5.0 SUMMARY OF SITE ACTIVITIES

Section 5.0 contains a summary of the key submittals and the significant activities that occurred in 2014.

- Deliverables, Reports, and Letters Completed and Submitted to EPA and CDPHE
- Water Treatment Plant Permit Renewal Application submitted January 27, 2014.
- Surface Water and Groundwater Monitoring Plan for 2014, dated February 4, 2014.
- 2013 Pipeline Inspection and Maintenance Report, dated February 17, 2014.
- Emergency Response/Contingency Plan, dated March 11, 2014.
- Annual Report for Eagle Mine Site – 2013, dated April 24, 2014.
- 2014 Spring Inspection Report Completion of Recommended Actions, dated August 11, 2014.
- Surface Water and Groundwater Monitoring Plan for 2015, dated December 19, 2014.

5.1 Pipeline Operation and Maintenance

The 2014 Pipeline Inspection and Maintenance Report will be submitted in April 2015.

5.2 Site Inspections and Audits

- General site inspections were performed during weekdays, recording observations on the Daily Inspection Forms.
- CDPHE's annual inspection was conducted on May 20, 2014.

5.3 WTP Operation and Maintenance

- The WTP treated 142,208,936 gallons of water, generating approximately 1,713 cubic yards of dewatered sludge. The sludge was placed in the lined Sludge Cell.

- An obstruction in the influent pipe from the Upper Pond into the wet well in the WTP was originally observed in November 2013. Several attempts were made to jet the line from the wet well and from the pond. In addition, compressed air was blown through the pipe to try to free the obstruction and locate the end of the pipe in the Upper Pond. Sludge removal activities were initiated on October 6, 2014 and were performed until October 24, 2014 when the influent pipe was uncovered and jetted. A video inspection was subsequently performed to verify the obstruction was removed. Approximately 3,000 cubic yards of sludge was pumped to the Sludge Cell and decant water was pumped back to the Lower Pond. The jetting of the influent pipe returned normal flows to the WTP.

- The major plant upgrades included.
  - The WTP influent pump was replaced in November 2014 improving plant flow.
  - Seven duckbill diffusers were replaced in R1 and the remainder was cleaned.
  - New sludge press cloths were installed.
  - A new flow meter to measure flow from the CTP groundwater collection system was installed in September 2014.

- Jetting of facility pipelines and structures included the following.
  - The pipe from the influent wet well to R1 tank increasing plant flow.
  - The Upper Pond vault was vacuumed.
  - The discharge line from the vault to the Upper Pond.
  - By-pass line from the vault to the Lower Pond.
  - Remaining solids in the plant vault were vacuumed.
  - Sump by the in–house water supply was vacuumed.
  - R3 tank bottom was vacuumed (approximately 1.5 feet of material) which required a maintenance shutdown for 4 hours.
  - The pipe between R2 and the Clarifier was jetted.
  - The corrugated metal pipe (CMP) culvert under Highway 24 where the WTP PVC discharge pipe was inserted was observed to be backing up on June 19, 2014. The culvert was jetted which removed soil and roots which removed the obstruction. A video performed in December 2014 confirmed the culvert was still free of obstructions from the June activities.

- Golder Associates continued their pre-design study of the most cost effective treatment process and site for a new water treatment plant.

5.4 Liberty Well No. 4 (Lib-4) Operation and Maintenance

- During the year, approximately 70 million gallons of water was pumped from the 19-5-E-3 tunnel to Willow Creek.

- The pump motor was replaced in November 2014 and the pump rate was increased to 178 gpm.

- A new permit for the Lib-4 discharge to Willow Creek was issued by CDPHE WQCD on August 28, 2014 and became effective on October 1, 2014.

- Modifications and upgrades were made to increase the reliability of the power supply at Lib-4. Installation of a line-of-sight communication system with a fixed telephone in Red Cliff was initiated in 2014.

5.5 Focused Feasibility Study (FFS) Activities

- Rock Creek pumping well EDS-3 was operated from April 18 to May 15, 2014 to intercept metal loads entering the river from Rock Creek groundwater.

- A total of 63,000 gallons of water was pumped to the treatment plant from the Mill Level in Belden to maintain a low water level.

5.6 Community Involvement and Community Relations

- NewFields and ENVIRON assisted CDWP in the annual fish shock program, April 3, 2014.

- CBS, ENVIRON and NewFields presented a status update of the Eagle Mine Site as part of the Eagle River Watershed Council Watershed Wednesdays series on August 26, 2014.

- Deputy Lisa Vasquez and Fire Department personnel toured the site in October 2014 to become familiar with the Site including the Belden area.

5.7 Planned 2015 Activities and Submittals

- Mine water withdrawal rate will be measured daily as recorded by the SCADA system at the plant and at the totalizing meter on the MDD pipeline located near the mouth of Rock Creek.

- The mine pool elevation will be measured routinely. CBS will seek approval from EPA and CDPHE to use the pressure transducer located in the Lib-4 well rather than the pressure gauge in the MDD pipeline.

- General site inspections will be performed by site personnel on weekdays.

- Accumulated water in the Temp Cell and Sludge Cell will be periodically pumped to the WTP surge ponds for treatment.

- Accumulated debris at the Tramway culvert in Belden will be periodically removed.

- Accumulated debris at seep 7 and the WP-8 seep collection facilities will be periodically removed and transported to the Sludge Cell.

- Debris from the beaver dams in upper Rock Creek will be periodically removed and transported to the Sludge Cell.

- Scale will be periodically cleaned from the pipelines and the sediment traps.

- The 2014 Pipeline Maintenance report will be submitted to EPA and CDPHE in April 9, 2015 2015.

- An addendum to the FFS regarding arsenic will be addressed with EPA and CDPHE.

- The Lib-4 well will be operated on a full-time basis up to a monthly average of 210 gpm. Samples will be collected to meet the permit requirements. Communication upgrades for this remote well will be evaluated and, if feasible, added to increase its reliability and decrease pump down time.

- The CTP groundwater extraction trenches will continue to operate, pumping groundwater to the Surge Ponds at the WTP.

- Rock Creek pumping well EDS-3 will be pumped in the spring to intercept metal load entering the river from Rock Creek.

- The water in the Mill Level in Belden will be removed periodically and treated to maintain a low water level.

- The WTP will continue to operate and upgrades will continue to be made as needed.

- The river will be sampled every other week during March and April in accordance with the Surface Water and Groundwater Sampling Plan for 2015, Eagle Mine Site.

- A Site Tour for the public is scheduled for July 29, 2015.

6.0 REFERENCES

Dames & Moore, 1989. Eagle Mine Site, Remedial Action Program, Environmental Monitoring Plan. October 1989.

Dames & Moore, 1995. Final Rock Creek Extraction System Report.

Dames & Moore, 1996. Surface Water Sampling and Analysis Plan.

Dames & Moore, 1998. Eagle Mine Annual Site Monitoring and Activity Report 1997.

ENVIRON. 2014. Emergency Response/Contingency Plan, Eagle Mine Superfund Site. March 11.

Natural Resources Conservation Service (NRCS), 2013 and 2014
Upper Colorado River Basin snowpack
2013: ftp://ftp.wcc.nrcs.usda.gov/data/snow/basin_reports/colorado/wy2013/basnco4.txt
2014: ftp://ftp.wcc.nrcs.usda.gov/data/snow/basin_reports/colorado/wy2014/basnco4.txt

NewFields, 2007a. *Eagle Mine Site - Belden Groundwater Extraction System Performance Report.* January 19.

NewFields, 2007b. *Eagle Mine Site - Belden Groundwater Extraction System Performance Report No. 2.* July 25.

NewFields, 2007c. *Eagle Mine Site - Belden Groundwater Extraction System Performance Report No. 2, Revision 1.* August 21.

NewFields, 2008a. *Eagle Mine Site - Belden Groundwater Extraction Performance Report No. 3*, July 9.

NewFields, 2011a. *Eagle Mine Annual Report – 2010, Eagle Mine Site, Minturn, Colorado.* Prepared for CBS Operations, Inc. April 7, 2011.

NewFields, 2013a. *East Trench Evaluation Report*. Prepared for CBS Operations, Inc. January 16, 2013.

NewFields, 2013b. *Focus Feasibility Study, Eagle Mine Site, Minturn, Colorado.* Prepared for CBS Operations, Inc. January 24, 2013.

NewFields, 2014. *Surface Water and Groundwater Monitoring for 2014, Eagle Mine Site, Minturn, Colorado.* Memorandum to CDPHE and EPA and prepared on behalf of CBS Operations, Inc. February 4, 2014.

APPENDIX A

SURFACE WATER DATA

A-1 Eagle River Water Quality Data
Eagle Mine Site
January through December 2014

Eagle River Water Quality Report

Eagle Mine Site, January through December 2014

Station ID / Sample Date and Time	Station Description / Flow (cfs)	Field Temperature (Deg. C)	Field Spec. Cond. @25C (umhos/cm)	Field Temperature (Deg. C)	Calcium Dissolved (mg/L)	Magnesium Dissolved (mg/L)	Calculated Hardness (mg/L)	Arsenic Total (mg/L)	Cadmium Dissolved (mg/L)	Copper Dissolved (mg/L)	Zinc Dissolved (mg/L)
E- 3	*EAGLE RIVER ABOVE BELDEN*										
3/20/2014 12:16	--	1	151.6	1	15.7	6.18	65	0.0002 U	0.00018	0.0045	0.0429
4/3/2014 13:55	--	2.1	172	2.1	16.3	6.87	69	0.0002 U	0.00024	0.0046	0.059
4/17/2014 16:00	--	7.6	125	7.6	13.4	5.55	56	0.00035	0.00032	0.0073	0.101
9/24/2014 15:20	--	13.1	201	13.1	17.4	6.72	71	0.00022	0.0001 U	0.002 U	0.01 U
E-10	*EAGLE RIVER ABOVE ROCK CREEK*										
3/20/2014 12:34	--	1.4	161	1.4	16.4	6.79	69	0.0004	0.0007	0.0058	0.259
4/3/2014 13:20	--	1.7	178	1.7	17.7	7.28	74	0.00028	0.0011	0.0061	0.306
4/17/2014 14:45	--	5	127	5	13.2	5.51	56	0.00046	0.00081	0.0072	0.209
9/24/2014 14:50	--	13	179	13	16.9	6.34	68	0.0002 U	0.0001 U	0.0028	0.0375
E-12A	*EAGLE RIVER BELOW OLD TAILINGS*										
3/20/2014 13:15	31 Ae	1.3	209.4	1.3	24.5	10.8	106	0.00029	0.0004	0.0023	0.197
4/3/2014 12:40	38 Ae	2.2	199	2.2	20.5	8.73	87	0.00029	0.001	0.0044	0.342
4/17/2014 17:40	143 A	7	147	7	15.3	6.17	64	0.00092	0.00093	0.0077	0.248
9/24/2014 15:40	67 A	14.3	189	14.3	17.9	6.86	73	0.00023	0.0001 U	0.002 U	0.0324
E-15	*EAGLE RIVER BELOW CROSS CREEK*										
3/20/2014 13:56	--	1.9	249	1.9	24.7	11.3	108	0.00031	0.00043	0.0025	0.196
4/3/2014 12:20	--	2	226	2	22.2	9.84	96	0.0002	0.00078	0.0036	0.251
4/17/2014 17:10	--	7.9	165	7.9	16.3	7	69	0.00047	0.00064	0.0059	0.171
9/24/2014 13:40	--	13	149	13	18.9	7.22	77	0.0002 U	0.0001 U	0.002	0.0324
E-22	*EAGLE RIVER ABOVE DOWDS JUNCT.*										
3/20/2014 14:05	--	3.7	269	3.7	27.2	11.9	117	0.00031	0.00037	0.0023	0.176
4/3/2014 12:05	--	2.2	246	2.2	23.6	10.6	102	0.00026	0.00063	0.0034	0.22
4/17/2014 16:50	--	8	171	8	17.1	6.68	70	0.00045	0.00059	0.0061	0.168
9/24/2014 13:15	--	12	158	12	20	7.49	81	0.0002 U	0.0001 U	0.002 U	0.04

NM or "--" - Not Measured NA - Not Available est - Estimated Flow U - Undetected at stated detection limit J - Estimated Concentration

Flow for E-12A and T-18 from USGS gages, "e" - est due to ice; A - USGS finalized and P indicates the USGS reported this datum as preliminary and subject to revision.

Eagle River Water Quality Report

Eagle Mine Site, January through December 2014

Station ID / Sample Date and Time	Station Description / Flow (cfs)	Field Temperature (Deg. C)	Field Spec. Cond. @25C (umhos/cm)	Field Temperature (Deg. C)	Calcium Dissolved (mg/L)	Magnesium Dissolved (mg/L)	Calculated Hardness (mg/L)	Arsenic Total (mg/L)	Cadmium Dissolved (mg/L)	Copper Dissolved (mg/L)	Zinc Dissolved (mg/L)
T-10	*ROCK CREEK AT MOUTH*										
3/20/2014 12:58	NM	3.7	519	3.7	36.8	29	211	0.0019	0.0029	0.0031	1.74
4/3/2014 13:10	1.45	3.2	491	3.2	35.6	27.5	202	0.0017	0.0031	0.0043	1.61
4/17/2014 14:40	1	7	484	7	33.4	28.8	202	0.0014	0.0054	0.0201	2.07
9/24/2014 14:56	0.45	14.6	655	14.6	50	36.5	275	0.0025	0.0028	0.0035	0.961
T-18	*CROSS CREEK NEAR MOUTH*										
3/20/2014 13:41	5.7 Ae	2	92.3	2	8.96	3.13	35	0.00051	0.0001 U	0.0025	0.064
4/3/2014 11:40	7.8 Ae	2	116	2	11.4	4.11	45	0.0002 U	0.0001 U	0.002 U	0.0497
4/17/2014 17:20	28 Ae	8.2	102	8.2	10.5	3.53	41	0.00025	0.0001 U	0.0027	0.0348
9/24/2014 13:55	29 A	13	65	13	7.85	1.94	28	0.0002 U	0.0001 U	0.0035	0.0202
WC-0	*Willow Creek upstream of the Liberty Discharge 001*										
3/6/2014 14:00	--	2	299	2	30.9	14.7	138	0.0002 U	--	0.002 U	0.01 U

NM or "--" - Not Measured NA - Not Available est - Estimated Flow U - Undetected at stated detection limit J - Estimated Concentration

Flow for E-12A and T-18 from USGS gages, "e" - est due to ice; A - USGS finalized and P indicates the USGS reported this datum as preliminary and subject to revision.

A-2 Eagle River Flow Relationships

Appendix A-2

Estimated Flow Rates from Historical Flow Records for Each Eagle River Monitoring Station to Monitoring Station E-12A

Eagle River Monitoring Station	Flow Rate Equation
E-3 - above Belden	*E-3 Flow = 0.8855 (E-12A Flow) - 0.0872*
E-5 - above Fall Creek	*E-5 Flow = 0.9424 (E-12A Flow) - 2.0748*
E-10 - above Rock Creek	*E-10 Flow = 0.9979 (E-12A Flow) + 1.7100*
E-11 - below Rock Creek	*E-11 Flow = 1.0124 (E-12A Flow) + 1.7416*
E-12A - below Old Tailings Pile/Rex Flats	*E-12A Flow (measured at USGS station 09064600)*
E-13B - above Cross Creek	*E-13B Flow = 1.1390 (E-12A Flow) - 0.2774*
E-15 - below Cross Creek	*E-15 Flow = 1.7333 (E-12A Flow) - 10.918*
E-22 - above Dowds Junction	*E-22 Flow = E-15 Flow (conservative assumption per CDPHE)*

Graphs used to determine the equation are provided in *Eagle Mine Annual Report – 2007, Eagle Mine Site Minturn, Colorado*, prepared by NewFields, February 29, 2008 for CBS Operations Inc.

APPENDIX B

EAGLE MINE WATER DATA

B-1 Eagle Mine Drawdown (MDD)
Eagle Mine Site
January through December 2014

Table B-1 Eagle Mine Drawdown

Eagle Mine Site, January through December 2014

Date	Discharge (gallons/day)	Cumulative Discharge (gallons YTD)	Hours from Previous Reading	Average Discharge (gpm)	Eagle Mine Water Level (Ft. MSL)
1/2/14	186,147	343,854	44.3	129	
1/3/14	203,873	564,716	26.0	142	8,458.05 *
1/6/14	187,983	1,145,636	74.2	131	
1/7/14	187,532	1,315,196	21.7	130	
1/8/14	187,285	1,502,091	24.0	130	
1/9/14	182,368	1,684,586	24.0	127	
1/13/14	180,807	2,426,650	98.5	126	8,457.59 *
1/14/14	188,538	2,592,930	21.2	131	
1/15/14	188,161	2,783,704	24.3	131	
1/16/14	188,928	3,000,840	27.6	131	
1/17/14	188,480	3,172,304	21.8	131	
1/20/14	188,525	3,735,391	71.7	131	8,457.36 *
1/21/14	181,915	3,917,306	24.0	126	
1/22/14	182,143	4,114,375	26.0	126	
1/23/14	181,841	4,267,046	20.2	126	
1/24/14	181,418	4,479,456	28.1	126	8,457.36 *
1/27/14	189,900	5,017,374	68.0	132	
1/28/14	189,772	5,230,077	26.9	132	
1/29/14	189,360	5,401,027	21.7	131	8,457.12 *
1/30/14	187,435	5,612,282	27.0	130	
2/5/14	186,065	6,705,804	141.0	129	8,457.12 *
2/6/14	184,092	6,892,836	24.4	128	
2/7/14	183,795	7,078,418	24.2	128	8,456.89 *
2/10/14	192,369	7,651,518	71.5	134	
2/11/14	192,504	7,844,289	24.0	134	
2/12/14	190,240	8,054,346	26.5	132	
2/13/14	190,174	8,220,880	21.0	132	
2/14/14	190,116	8,415,485	24.6	132	8,456.43 *
2/18/14	174,188	9,104,860	95.0	121	
2/19/14	174,030	9,301,006	27.0	121	
2/20/14	173,151	9,456,481	21.5	120	8,456.43 *
2/21/14	173,622	9,631,429	24.2	121	8,456.43 *
2/24/14	174,376	10,171,996	74.4	121	
2/25/14	174,181	10,341,460	23.3	121	
2/26/14	173,645	10,500,032	21.9	121	
2/27/14	173,863	10,677,396	24.5	121	
2/28/14	173,257	10,849,690	23.9	120	8,456.20 *
3/3/14	171,511	11,372,798	73.2	119	
3/4/14	148,002	11,515,044	23.1	103	
3/5/14	147,545	11,662,896	24.0	102	
3/6/14	147,223	11,803,678	22.9	102	
3/7/14	146,946	11,953,685	24.5	102	8,456.43 *

* Mine water level reading from pressure transducer

Table B-1 Eagle Mine Drawdown

Eagle Mine Site, January through December 2014

Date	Discharge (gallons/day)	Cumulative Discharge (gallons YTD)	Hours from Previous Reading	Average Discharge (gpm)	Eagle Mine Water Level (Ft. MSL)
3/10/14	145,857	12,393,079	72.3	101	8,456.20 *
3/11/14	174,829	12,567,908	24.0	121	
3/12/14	174,123	12,738,766	23.5	121	
3/13/14	173,384	12,929,850	26.4	120	
3/14/14	173,072	13,093,187	22.6	120	8,456.43 *
3/17/14	170,317	13,602,483	71.8	118	
3/18/14	170,492	13,772,620	24.0	118	
3/19/14	170,903	13,936,283	23.0	119	
3/20/14	170,904	14,107,306	24.0	119	
3/21/14	171,347	14,282,699	24.6	119	8,456.20 *
3/24/14	173,041	14,811,314	73.3	120	
3/25/14	173,104	14,972,998	22.4	120	
3/26/14	172,427	15,169,972	27.4	120	8,456.20 *
3/27/14	174,386	15,319,774	20.6	121	
3/28/14	173,377	15,497,485	24.6	120	8,455.97 *
3/31/14	171,185	16,013,656	72.4	119	
4/1/14	170,209	16,183,038	23.9	118	
4/2/14	170,002	16,346,783	23.1	118	
4/3/14	169,766	16,519,261	24.4	118	
4/4/14	169,759	16,682,300	23.0	118	8,456.20 *
4/7/14	176,706	17,228,126	74.1	123	
4/8/14	176,646	17,393,854	22.5	123	
4/9/14	199,054	17,584,891	23.0	138	8,456.20 *
4/10/14	198,339	17,792,596	25.1	138	
4/11/14	197,477	18,005,295	25.9	137	8,456.43 *
4/14/14	201,552	18,625,346	73.8	140	
4/15/14	190,089	18,788,638	20.6	132	
4/16/14	190,512	18,975,181	23.5	132	8,457.12 *
4/17/14	217,606	19,163,471	20.8	151	
4/18/14	171,261	19,385,635	31.1	119	8,457.36 *
4/21/14	196,026	19,947,986	68.9	136	8,457.82 *
4/22/14	195,301	20,124,571	21.7	136	
4/23/14	195,862	20,346,276	27.2	136	8,458.05 *
4/24/14	193,125	20,522,100	21.8	134	
4/25/14	184,766	20,712,640	24.8	128	8,458.97 *
4/28/14	176,410	21,238,441	71.5	123	8,459.66 *
4/29/14	179,283	21,423,202	24.7	125	
4/30/14	175,989	21,610,801	25.6	122	
5/1/14	174,515	21,756,836	20.1	121	
5/2/14	173,153	21,938,286	25.2	120	8,460.36 *
5/5/14	172,365	22,461,485	72.8	120	8,461.05 *
5/6/14	174,158	22,634,796	23.9	121	

* Mine water level reading from pressure transducer

Table B-1 Eagle Mine Drawdown

Eagle Mine Site, January through December 2014

Date	Discharge (gallons/day)	Cumulative Discharge (gallons YTD)	Hours from Previous Reading	Average Discharge (gpm)	Eagle Mine Water Level (Ft. MSL)
5/7/14	178,716	22,812,519	23.9	124	8,461.74 *
5/8/14	177,977	22,991,361	24.1	124	
5/9/14	174,405	23,170,126	24.6	121	8,462.44 *
5/12/14	173,478	23,712,846	75.1	120	8,463.36 *
5/13/14	170,136	23,864,196	21.3	118	
5/14/14	167,501	24,027,742	23.4	116	8,463.82 *
5/15/14	171,591	24,198,261	23.9	119	
5/16/14	169,398	24,370,247	24.4	118	8,464.28 *
5/19/14	168,975	24,869,194	70.9	117	8,464.74 *
5/20/14	132,155	25,001,074	24.0	92	
5/21/14	155,857	25,160,070	24.5	108	
5/22/14	187,393	25,349,675	24.3	130	
5/23/14	184,937	25,551,179	26.1	128	8,465.67 *
5/27/14	173,680	26,230,461	93.9	121	8,466.59 *
5/28/14	183,155	26,412,598	23.9	127	
5/29/14	178,839	26,589,574	23.7	124	8,466.82 *
5/30/14	215,867	26,804,242	23.9	150	8,467.05 *
6/2/14	213,236	27,452,539	73.0	148	8,467.51 *
6/3/14	223,951	27,674,468	23.8	156	
6/4/14	217,602	27,914,435	26.5	151	8,467.75 *
6/5/14	211,559	28,095,876	20.6	147	
6/6/14	218,797	28,347,644	27.6	152	8,467.98 *
6/9/14	210,438	28,956,890	69.5	146	8,468.21 *
6/10/14	221,484	29,184,065	24.6	154	
6/11/14	222,069	29,385,161	21.7	154	8,468.44 *
6/12/14	239,610	29,640,745	25.6	166	
6/13/14	240,225	29,872,128	23.1	167	8,468.67 *
6/16/14	259,399	30,672,662	74.1	180	8,469.36 *
6/17/14	221,294	30,897,030	24.3	154	
6/18/14	229,772	31,090,102	20.2	160	8,468.90 *
6/19/14	211,611	31,348,738	29.3	147	
6/20/14	178,318	31,478,266	17.4	124	8,468.90 *
6/23/14	191,213	32,078,331	75.3	133	8,469.13 *
6/24/14	265,724	32,392,771	28.4	185	
6/25/14	266,307	32,581,035	17.0	185	8,468.90 *
6/26/14	267,525	32,873,826	26.3	186	8,468.90 *
6/27/14	265,676	33,156,476	25.5	184	8,468.90 *
6/30/14	267,438	33,940,217	70.3	186	8,468.67 *
7/1/14	267,196	34,224,669	25.5	186	
7/2/14	267,351	34,475,125	22.5	186	8,468.44 *
7/3/14	266,177	34,772,356	26.8	185	
7/7/14	268,418	35,847,892	96.2	186	8,468.21 *

* Mine water level reading from pressure transducer

Table B-1 Eagle Mine Drawdown

Eagle Mine Site, January through December 2014

Date	Discharge (gallons/day)	Cumulative Discharge (gallons YTD)	Hours from Previous Reading	Average Discharge (gpm)	Eagle Mine Water Level (Ft. MSL)
7/8/14	268,527	36,085,650	21.2	186	
7/9/14	268,055	36,325,410	21.5	186	8,467.75 *
7/10/14	266,563	36,644,545	28.7	185	
7/11/14	266,895	36,879,746	21.1	185	8,467.75 *
7/14/14	264,021	37,674,009	72.2	183	
7/15/14	221,227	37,936,563	28.5	154	8,467.51 *
7/16/14	144,927	38,059,348	20.3	101	8,467.75 *
7/17/14	153,143	38,219,723	25.1	106	
7/18/14	153,280	38,387,054	26.2	106	8,467.75 *
7/21/14	150,506	38,809,724	67.4	105	8,467.75 *
7/22/14	219,247	39,041,608	25.4	152	
7/23/14	219,056	39,235,564	21.2	152	
7/24/14	219,582	39,472,682	25.9	152	8,467.51 *
7/25/14	215,541	39,723,847	28.0	150	8,467.51 *
7/28/14	258,039	40,475,566	69.9	179	
7/29/14	258,250	40,706,198	21.4	179	8,467.05 *
7/30/14	254,572	40,957,234	23.7	177	
7/31/14	254,710	41,214,774	24.3	177	
8/1/14	254,271	41,469,752	24.1	177	8,466.82 *
8/4/14	214,100	42,128,258	73.8	149	
8/5/14	247,389	42,350,393	21.6	172	
8/6/14	247,836	42,593,926	23.6	172	
8/7/14	246,944	42,859,391	25.8	171	8,466.59 *
8/8/14	245,357	43,119,061	25.4	170	8,466.59 *
8/11/14	249,672	43,852,299	70.5	173	
8/12/14	248,820	44,097,490	23.7	173	
8/13/14	249,008	44,348,746	24.2	173	
8/14/14	230,034	44,574,467	23.5	160	
8/15/14	229,785	44,810,475	24.7	160	8,465.90 *
8/18/14	230,039	45,502,829	72.2	160	
8/19/14	213,701	45,699,909	22.1	148	
8/20/14	214,005	45,929,073	25.7	149	
8/21/14	213,334	46,139,000	23.6	148	
8/22/14	214,099	46,354,140	24.1	149	8,465.67 *
8/24/14	214,560	46,841,841	38.0	149	
8/25/14	power outage	46,841,841	33.4		
8/26/14	185,783	47,033,817	24.8	129	
8/27/14	100,126	47,139,088	25.2	70	
8/28/14	100,318	47,229,444	21.6	70	
8/29/14	162,619	47,417,359	27.7	113	8,466.36 *
9/2/14	238,062	48,323,152	91.3	165	
9/3/14	273,212	48,623,116	26.3	190	

* Mine water level reading from pressure transducer

Table B-1 Eagle Mine Drawdown

Eagle Mine Site, January through December 2014

Date	Discharge (gallons/day)	Cumulative Discharge (gallons YTD)	Hours from Previous Reading	Average Discharge (gpm)	Eagle Mine Water Level (Ft. MSL)
9/4/14	253,067	48,847,537	21.3	176	
9/5/14	252,713	49,125,697	26.4	175	8,465.44 *
9/8/14	254,427	49,900,464	73.1	177	
9/9/14	254,342	50,123,896	21.1	177	
9/10/14	253,629	50,381,048	24.3	176	
9/11/14	253,628	50,659,158	26.3	176	
9/12/14	253,701	50,905,812	23.3	176	8,464.74 *
9/15/14	240,631	51,634,889	72.7	167	
9/16/14	230,311	51,893,189	26.9	160	
9/17/14	230,148	52,087,376	20.3	160	
9/18/14	229,403	52,330,957	25.5	159	
9/19/14	229,271	52,553,859	23.3	159	8,464.74 *
9/22/14	220,155	53,216,771	72.3	153	
9/24/14	217,348	53,639,392	46.7	151	
9/25/14	199,207	53,834,726	23.5	138	
9/26/14	135,121	53,975,946	25.1	94	8,464.05 *
9/27/14	219,463	54,179,864	22.3	152	
9/29/14	222,571	54,639,225	49.5	155	
9/30/14	216,647	54,850,456	23.4	150	
10/1/14	216,463	55,067,821	24.1	150	
10/2/14	216,037	55,284,008	24.0	150	
10/3/14	187,383	55,473,473	24.3	130	8,463.36 *
10/6/14	130,573	55,866,823	72.3	91	
10/7/14	107,080	55,975,390	24.3	74	
10/8/14	106,868	56,072,536	21.8	74	
10/9/14	106,987	56,194,680	27.4	74	
10/10/14	107,025	56,292,192	21.9	74	8,463.82 *
10/13/14	195,161	56,871,577	71.3	136	
10/14/14	218,093	57,105,270	25.7	151	
10/15/14	174,334	57,278,635	23.9	121	
10/16/14	217,930	57,475,529	21.7	151	
10/17/14	143,665	57,648,625	28.9	100	8,464.98 *
10/20/14	228,212	58,363,689	75.2	158	
10/21/14	253,757	58,555,593	18.1	176	
10/22/14	252,802	58,809,448	24.1	176	
10/23/14	253,014	59,126,594	30.1	176	
10/24/14	253,221	59,344,645	20.7	176	8,465.90 *
10/27/14	249,301	60,063,810	69.2	173	8,466.13 *
10/28/14	227,733	60,294,390	24.3	158	
10/29/14	244,649	60,570,640	27.1	170	
10/30/14	256,949	60,827,054	24.0	178	
10/31/14	256,175	61,094,792	25.1	178	8,466.59 *

* Mine water level reading from pressure transducer

Table B-1 Eagle Mine Drawdown

Eagle Mine Site, January through December 2014

Date	Discharge (gallons/day)	Cumulative Discharge (gallons YTD)	Hours from Previous Reading	Average Discharge (gpm)	Eagle Mine Water Level (Ft. MSL)
11/3/14	255,699	61,833,479	69.3	178	
11/4/14	251,581	62,056,582	21.3	175	
11/5/14	252,064	62,348,556	27.8	175	
11/6/14	252,118	62,558,829	20.0	175	
11/7/14	252,460	62,816,724	24.5	175	8,467.05 *
11/10/14	249,591	63,563,071	71.8	173	
11/11/14	250,163	63,851,974	27.7	174	
11/12/14	250,793	64,077,688	21.6	174	
11/13/14	249,664	64,346,424	25.8	173	
11/14/14	249,480	64,566,971	21.2	173	8,466.59 *
11/17/14	240,630	65,312,923	74.4	167	
11/18/14	252,564	65,572,678	24.7	175	
11/19/14	250,954	65,795,051	21.3	174	
11/20/14	179,502	65,975,052	24.1	125	
11/21/14	250,442	66,214,711	23.0	174	8,467.28 *
11/24/14	231,608	66,932,858	74.4	161	
11/25/14	236,261	67,183,557	25.5	164	
11/26/14	236,260	67,380,276	20.0	164	
11/28/14	195,346	67,800,542	51.6	136	8,468.21 *
12/1/14	249,233	68,529,722	70.2	173	
12/2/14	249,926	68,775,135	23.6	174	
12/3/14	249,584	69,021,946	23.7	173	
12/4/14	254,911	69,268,537	23.2	177	
12/5/14	275,476	69,545,543	24.1	191	8,468.44 *
12/8/14	273,538	70,374,324	72.7	190	
12/9/14	271,474	70,640,708	23.5	189	
12/10/14	276,879	70,912,972	23.6	192	
12/11/14	296,056	71,176,750	21.4	206	8,468.44 *
12/12/14	84,385	71,266,116	25.4	59	
12/15/14	218,090	71,938,256	74.0	151	
12/16/14	265,631	72,212,926	24.8	184	
12/17/14	265,122	72,468,658	23.2	184	
12/18/14	217,812	72,708,402	26.4	151	
12/19/14	214,236	72,918,175	23.5	149	8,466.82 *
12/22/14	215,720	73,572,376	72.8	150	
12/24/14	221,246	74,032,076	49.9	154	
12/26/14	230,886	74,465,148	45.0	160	8,467.28 *
12/29/14	222,632	75,149,895	73.8	155	
12/30/14	226,681	75,376,576	24.0	157	
12/31/14	181,619	75,535,871	21.0	126	

* Mine water level reading from pressure transducer

B-2 Mine, Seep, and Groundwater Quality Report
Eagle Mine Site
2014

Mine, Seep, and Groundwater Quality Report

Eagle Mine Site, 2014

PARAMETER	UNITS	Sample Date	BW-10 BELDEN GROUNDWATER WELL	MS- 5 MDD (ADIT #5)	S- 5 SEEPAGE FROM ADIT NO. 5	S- 6 SEEP- ADJ. ROCK CRK CULVERT INLET	S-TT SEEPAGE FROM TIP TOP ADIT	E-SUMP SUMP OF EAST CTP EXTRACT TRENCH	N-SUMP SUMP OF NORTH CTP EXTRACT TRENCH	WTP-INF WTP INFLUENT
Aluminum Dissolved	mg/L	3/6/2014	120	0.055 J / 0.018 U	1.6	0.035 J		0.018 U	0.045 J	0.018 U
		5/19/2014	76	0.27	5.5	0.2 U		0.25	0.76	0.97 / 0.97
		9/23/2014	92	0.4 UJ	0.2 U	0.4 U	3.9	0.6	0.4 U / 0.4 U	0.4 U
Aluminum Total Rec.	mg/L	3/6/2014	120	0.091 J / 0.072 J	1.6	0.018 U		0.018 U	0.1	0.018 U
		5/19/2014	120	0.41	5.4	0.2 U		0.63	1	0.99 / 1
		9/23/2014	94	0.4 UJ	0.2 U	0.4 U	3.9	21	0.4 U / 0.4 U	0.4 U
Antimony Dissolved	mg/L	3/6/2014	0.0024 J	0.00034 J / 0.00025 J	0.00016 U	0.00016 U		0.00016 U	0.00016 U	0.00016 U
		5/19/2014	0.003 U	0.0003 U	0.0015 U	0.0015 U		0.0015 U	0.003 U	0.0015 U / 0.0015 U
		9/23/2014	0.006 U	0.0006 UJ	0.0003 U	0.0006 U	0.0015 U	0.003 U	0.0015 U / 0.0015 U	0.0006 U
Antimony Total Rec.	mg/L	3/6/2014	0.004 J	0.00078 J / 0.00066 J	0.00019 J	0.00016 U		0.00016 U	0.00016 U	0.00016 U
		5/19/2014	0.0035	0.0003 U	0.0015 U	0.0015 U		0.0015 U	0.003 U	0.0015 U / 0.0015 U
		9/23/2014	0.012	0.0006 UJ	0.0003 U	0.0006 U	0.0018	0.003 U	0.0015 U / 0.0015 U	0.0006 U
Arsenic Dissolved	mg/L	3/6/2014	0.5	0.24 JB / 0.24 JB	0.086 JB	0.024 JB		0.043 JB	0.24 JB	0.0076 JB
		5/19/2014	0.072	0.028	0.029	0.02		0.17	0.034	0.01 U / 0.01 U
		9/23/2014	0.049	0.24 J	0.022	0.026	0.23	0.066	0.25 / 0.29	0.0078
Arsenic Total Rec.	mg/L	3/6/2014	0.57	0.49 / 0.47	0.13	0.043		0.048	0.29	0.022
		5/19/2014	0.11	0.056	0.15	0.036		0.17	0.043	0.013 / 0.015
		9/23/2014	0.45	0.28 J	0.052	0.037	0.27	2.4	0.31 / 0.28	0.022
Barium Dissolved	mg/L	3/6/2014	0.0038 U	0.011 / 0.012	0.0069	0.0086		0.0074	0.013	0.01
		5/19/2014	0.01 U	0.014	0.012	0.01		0.013 J	0.01 U	0.014 / 0.017
		9/23/2014	0.02 U	0.012 J	0.0084	0.0087	0.005 U	0.011	0.013 / 0.014	0.013
Barium Total Rec.	mg/L	3/6/2014	0.0038 U	0.013 / 0.013	0.0074	0.0091		0.0081	0.014	0.01
		5/19/2014	0.012	0.015	0.0087	0.013		0.0087 J	0.01 U	0.012 / 0.01
		9/23/2014	0.064	0.011 J	0.01	0.012	0.005 U	0.034	0.015 / 0.016	0.013
Boron Dissolved	mg/L	3/6/2014	0.0095 J	0.038 J / 0.037 J	0.034 J	0.044 J		0.046 J	0.15	0.052 J
		5/19/2014	0.1 U	0.1 U	0.1 U	0.1 U		0.11	0.1 U	0.1 U / 0.1 U
		9/23/2014	0.5 U	0.2 UJ	0.1 U	0.2 U	0.2 U	0.2 U	0.2 U / 0.2 U	0.2 U
Boron Total Rec.	mg/L	3/6/2014	0.0085 J	0.036 J / 0.036 J	0.033 J	0.044 J		0.043 J	0.14	0.051 J
		5/19/2014	0.1 U	0.1 U	0.1 U	0.1 U		0.11	0.1 U	0.1 U / 0.1 U
		9/23/2014	0.5 U	0.2 UJ	0.1 U	0.2 U	0.2 U	0.2 U	0.2 U / 0.2 U	0.2 U
Cadmium Dissolved	mg/L	3/6/2014	4.8	0.019 / 0.019	0.058	0.029		0.0016	0.00029 J	0.016
		5/19/2014	6.6	0.35	0.26	0.032		0.0015 U	0.0045	0.29 / 0.31
		9/23/2014	4.8	0.045 J	0.029	0.031	0.067	0.003 U	0.0015 U / 0.0015 U	0.043
Cadmium Total Rec.	mg/L	3/6/2014	4.8	0.02 / 0.021	0.06	0.031		0.0017	0.0002 J	0.016
		5/19/2014	13	0.34	0.25	0.036		0.0015 U	0.0059	0.3 / 0.3
		9/23/2014	4.3	0.044 J	0.032	0.031	0.068	0.0077	0.0015 U / 0.0015 U	0.044
Calcium Dissolved	mg/L	3/6/2014	340	400 / 400	300	390		430	230	370
		5/19/2014	380	300	240	410		230	390	330 / 330
		9/23/2014	390	400 J	270	380	310	440	240 / 240	390
Calcium Total Rec.	mg/L	3/6/2014	340	380 / 390	300	390		420	230	370
		5/19/2014	340	290	240	420		230	380	330 / 330
		9/23/2014	400	410 J	270	390	310	450	240 / 240	400

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Mine, Seep, and Groundwater Quality Report

Eagle Mine Site, 2014

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Chromium Dissolved	mg/L	3/6/2014	0.044	0.00088 U / 0.00088 U	0.00099 J	0.00088 U		0.00088 U	0.00088 U	0.00088 U
		5/19/2014	0.1 U	0.01 U	0.05 U	0.05 U		0.05 U	0.1 U	0.05 U / 0.05 U
		9/23/2014	0.2 U	0.02 UJ	0.01 U	0.02 U	0.05 U	0.1 U	0.05 U / 0.05 U	0.02 U
Chromium Total Rec.	mg/L	3/6/2014	0.044	0.00088 U / 0.00088 U	0.0011 J	0.00088 U		0.00088 U	0.00088 U	0.00088 U
		5/19/2014	0.1 U	0.01 U	0.05 U	0.05 U		0.05 U	0.1 U	0.05 U / 0.05 U
		9/23/2014	0.2 U	0.02 UJ	0.01 U	0.02 U	0.05 U	0.1 U	0.05 U / 0.05 U	0.02 U
Cobalt Dissolved	mg/L	3/6/2014	0.13	0.012 / 0.012	0.052	0.021		0.033	0.0088	0.016
		5/19/2014	0.12	0.011	0.036	0.021		0.011	0.03	0.017 / 0.019
		9/23/2014	0.16	0.016 J	0.011	0.022	0.064	0.037	0.0095 / 0.01	0.018
Cobalt Total Rec.	mg/L	3/6/2014	0.13	0.012 / 0.012	0.053	0.021		0.033	0.0084	0.015
		5/19/2014	0.23	0.012	0.035	0.022		0.01	0.029	0.015 / 0.018
		9/23/2014	0.16	0.015 J	0.011	0.023	0.067	0.038	0.0088 / 0.0096	0.018
Copper Dissolved	mg/L	3/6/2014	32	0.028 JB / 0.026 JB	1.8	0.00055 UJB		0.00045 UJB	0.0013 UJB	0.0042 JB
		5/19/2014	24	0.51	4.5	0.05 U		0.05 U	0.1 U	1.1 / 1.2
		9/23/2014	12	0.059 J	0.01 U	0.02 U	3.8	0.1 U	0.05 U / 0.05 U	0.029
Copper Total Rec.	mg/L	3/6/2014	32	0.087 / 0.082	1.8	0.0012 J		0.00065 J	0.0018 J	0.015
		5/19/2014	45	0.53	4.2	0.05 U		0.05 U	0.1 U	1.2 / 1.2
		9/23/2014	12	0.089 J	0.01 U	0.02 U	3.9	0.1 U	0.05 U / 0.05 U	0.056
Iron Dissolved	mg/L	3/6/2014	1800	60 / 61	200	45		410	97	30
		5/19/2014	1400	47	34	34		77	400	17 / 17
		9/23/2014	1100	61 J	14	46	360	520	130 / 130	16
Iron Total Rec.	mg/L	3/6/2014	1900	68 / 67	210	49		400	95	39
		5/19/2014	1800	52	61	42		77	410	20 / 20
		9/23/2014	1000	65 J	25	50	360	1000	130 / 130	24
Lead Dissolved	mg/L	3/6/2014	0.0036	0.00073 J / 0.00012 J	0.0051	0.0001 U		0.00015 J	0.0001 U	0.0001 U
		5/19/2014	0.009	0.0016	0.027	0.0025 U		0.0025 U	0.005 U	0.012 / 0.01
		9/23/2014	0.015	0.001 UJ	0.0005 U	0.001 U	0.016	0.005 U	0.0025 U / 0.0025 U	0.001 U
Lead Total Rec.	mg/L	3/6/2014	0.098	0.028 / 0.021	0.0065	0.0042		0.0006 J	0.00038 J	0.00047 J
		5/19/2014	0.72	0.031	0.042	0.0059		0.0025 U	0.005 U	0.013 / 0.012
		9/23/2014	5.7	0.023 J	0.099	0.0037	0.015	0.079	0.0025 U / 0.0025 U	0.0016
Magnesium Dissolved	mg/L	3/6/2014	340	310 / 320	250	270		650	230	320
		5/19/2014	340	230	560	270		200	460	320 / 320
		9/23/2014	460	310 J	200	260	220	610	240 / 240	300
Magnesium Total Rec.	mg/L	3/6/2014	340	300 / 310	250	270		650	220	320
		5/19/2014	460	220	560	260		200	450	320 / 320
		9/23/2014	460	310 J	200	260	220	610	240 / 240	310
Manganese Dissolved	mg/L	3/6/2014	280	18 / 18	67	23		150	63	35
		5/19/2014	190	20	32	23		64	140	28 / 31
		9/23/2014	220	28 J	17	25	78	170	82 / 87	38
Manganese Total Rec.	mg/L	3/6/2014	280	19 / 18	69	24		150	66	36
		5/19/2014	280	20	30	26		59	140	31 / 29
		9/23/2014	220	27 J	19	26	80	170	83 / 82	38

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Mine, Seep, and Groundwater Quality Report

Eagle Mine Site, 2014

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Mercury	mg/L	3/6/2014	0.00019 J	0.000027 U / 0.000027 U	0.000027 U	0.000027 U		0.000027 U	0.000027 U	0.000027 U
		5/19/2014	0.0002 U	0.0002 U	0.0002 U	0.0002 U		0.0002 U	0.0002 U	0.0002 U / 0.0002 U
		9/23/2014	0.0009		0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U / 0.0002 U	0.0002 U
Mercury Dissolved	mg/L	3/6/2014	0.000096 J	0.000027 U / 0.000027 U	0.000027 U	0.000027 U		0.000027 U	0.000027 U	0.000027 U
		5/19/2014	0.0002 U	0.0002 U	0.0002 U	0.0002 U		0.0002 U	0.0002 U	0.0002 U / 0.0002 U
		9/23/2014		0.0002 UJ						
Molybdenum Dissolved	mg/L	3/6/2014	0.00042 J	0.0015 J / 0.0015 J	0.00004 U	0.00022 J		0.000065 J	0.0017 J	0.00023 J
		5/19/2014	0.01 U	0.001 U	0.005 U	0.005 U		0.005 U	0.01 U	0.005 U / 0.005 U
		9/23/2014	0.02 U	0.002 UJ	0.001 U	0.002 U	0.005 U	0.01 U	0.005 U / 0.005 U	0.002 U
Molybdenum Total Rec.	mg/L	3/6/2014	0.0004 U	0.0021 / 0.0021	0.000077 J	0.000086 J		0.000067 J	0.0018 J	0.00032 J
		5/19/2014	0.01 U	0.001 U	0.005 U	0.005 U		0.005 U	0.01 U	0.005 U / 0.005 U
		9/23/2014	0.02 U	0.002 UJ	0.001 U	0.002 U	0.005 U	0.01 U	0.005 U / 0.005 U	0.002 U
Nickel Dissolved	mg/L	3/6/2014	0.25	0.051 / 0.05	0.14	0.047		0.11	0.016	0.056
		5/19/2014	0.23	0.043	0.18	0.045		0.025 U	0.11	0.07 / 0.067
		9/23/2014	0.35	0.068 J	0.037	0.052	0.16	0.12	0.025 U / 0.025 U	0.069
Nickel Total Rec.	mg/L	3/6/2014	0.24	0.053 / 0.053	0.14	0.05		0.11	0.016	0.057
		5/19/2014	0.39	0.045	0.16	0.042		0.025 U	0.097	0.066 / 0.054 J-
		9/23/2014	0.31	0.064 J	0.04	0.055	0.16	0.12	0.025 U / 0.025 U	0.067
Phosphorus	mg/L	3/6/2014	2.2 J	0.014 U / 0.014 U	0.14 J	0.014 U		0.014 U	0.014 U	0.014
		5/19/2014	0.55	0.2 U	0.65	0.2 U		0.2 U	0.2 U	0.2 U / 0.2 U
		9/23/2014	1 U	0.4 UJ	0.2 U	0.4 U	0.49	0.49	0.4 U / 0.4 U	0.4 U
Phosphorus Dissolved	mg/L	3/6/2014	2 J	0.014 U / 0.014 U	0.055 J	0.014 U		0.014 U	0.014 U	0.014
		5/19/2014	0.36	0.2 U	0.2 U	0.2 U		0.2 U	0.2 U	0.2 U / 0.2 U
		9/23/2014	1 U	0.4 UJ	0.2 U	0.4 U	0.4 U	0.4 U	0.4 U / 0.4 U	0.4 U
Potassium Dissolved	mg/L	3/6/2014	240 U	14 / 15	7.7	12		9.8	11	14
		5/19/2014	1	11	6.3	14		13	11	12 / 11
		9/23/2014	5 U	14 J	11	12	7.2	12	13 / 13	14
Potassium Total Rec.	mg/L	3/6/2014	620 J+/-	14 / 14	7.7	12		9.7	11	13
		5/19/2014	1	10	5.8	13		13	11	11 / 11
		9/23/2014	5 U	14 J	11	12	7.2	14	13 / 13	13
Selenium Dissolved	mg/L	3/6/2014	0.011	0.001 U / 0.001 U	0.0017 J	0.001 U		0.001 U	0.001 U	0.001 U
		5/19/2014	0.01 U	0.001 U	0.005 U	0.005 U		0.005 U	0.01 U	0.005 U / 0.005 U
		9/23/2014	0.02 U	0.002 UJ	0.001 U	0.002 U	0.005 U	0.01 U	0.005 U / 0.005 U	0.002 U
Selenium Total Rec.	mg/L	3/6/2014	0.012	0.001 U / 0.001 U	0.0017 J	0.001 U		0.001 U	0.001 U	0.001 U
		5/19/2014	0.011	0.001 U	0.005 U	0.005 U		0.005 U	0.01 U	0.005 U / 0.005 U
		9/23/2014	0.02 U	0.002 UJ	0.001 U	0.002 U	0.005 U	0.01 U	0.005 U / 0.005 U	0.002 U
Silica Dissolved	mg/L	3/6/2014	89	16 / 16	19	16		25	18	13
		5/19/2014	69	13	20	15		18	22	15 / 15
		9/23/2014	71	15 J	14	15	23	26	18 / 18	12
Silica Total Rec.	mg/L	3/6/2014	89	16 / 16	20	16		25	18	13
		5/19/2014	81	13	20	16		18	22	15 / 15
		9/23/2014	73	15 J	15	16	23	63	18 / 18	13

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Silicon Dissolved	mg/l	9/23/2014	33	7 J	6.3	7.1	11	12	8.3 / 8.3	5.7
Silicon Total Rec.	mg/l	9/23/2014	34	7.1 J	6.9	7.3	11	30	8.5 / 8.5	6.1
Silver Dissolved	mg/L	3/6/2014	0.0053 J	0.00002 U / 0.00002 U	0.000032 J	0.00002 U		0.00002 U	0.00002 U	0.00002 U
		5/19/2014	0.0013	0.00054	0.0005 U	0.0005 U		0.0005 U	0.001 U	0.0005 U / 0.0005 U
		9/23/2014	0.002 U	0.0002 UJ	0.0001 U	0.0002 U	0.0005 U	0.001 U	0.0005 U / 0.0005 U	0.0002 U
Silver Total Rec.	mg/L	3/6/2014	0.014	0.00005 J / 0.000052 J	0.000071 J	0.00002 U		0.00002 U	0.00002 U	0.00002 U
		5/19/2014	0.014	0.0011	0.0005 U	0.0005 U		0.0005 U	0.001 U	0.0005 U / 0.0005 U
		9/23/2014	0.064	0.0002 UJ	0.0012	0.0002 U	0.0005 U	0.001 U	0.0005 U / 0.0005 U	0.0002 U
Sodium Dissolved	mg/L	3/6/2014	10	8.4 JB / 8.1 JB	16 JB	22 JB		77 JB	110	25 JB
		5/19/2014	7	7.5	8.8	20		88	51	18 / 18
		9/23/2014	9.1	9.5 J	8.2	19	17	66	89 / 90	18
Sodium Total Rec.	mg/L	3/6/2014	10	8.6 / 8.7	16	21 JB		78	110	25
		5/19/2014	9.1	7.2	8.4	20		88	50	18 / 17
		9/23/2014	9.7	9.5 J	8.3	19	17	69	91 / 90	18
Strontium Dissolved	mg/L	3/6/2014	0.43	0.29 / 0.3	0.47	1.2		0.77	0.59	0.36
		5/19/2014	0.43	0.22	0.37	1.1		0.58	0.51	0.32 / 0.33
		9/23/2014	0.43	0.29 J	0.24	0.98	0.38	0.66	0.55 / 0.57	0.33
Strontium Total	mg/L	3/6/2014	0.44	0.28 / 0.28	0.46	1.2		0.75	0.57	0.36
		5/19/2014	0.39	0.21	0.35	1.2		0.53	0.55	0.33 / 0.33
		9/23/2014	0.45	0.28 J	0.25	1.1	0.39	0.68	0.55 / 0.55	0.34
Thallium Dissolved	mg/L	3/6/2014	0.00065 J	0.0062 / 0.0063	0.004	0.002		0.0018	0.0037	0.0054
		5/19/2014	0.002	0.0056	0.003	0.0027		0.0048	0.0024	0.0052 / 0.0056
		9/23/2014	0.004 U	0.0074 J	0.0037	0.0024	0.0058	0.003	0.0051 / 0.0054	0.0071
Thallium Total	mg/L	3/6/2014	0.00086 J	0.0067 / 0.0066	0.0041	0.0022		0.0019	0.0039	0.0057
		5/19/2014	0.0029	0.0056	0.0028	0.0026		0.0048	0.0025	0.0058 / 0.0057
		9/23/2014	0.0068	0.0073 J	0.0042	0.0026	0.0061	0.004	0.0052 / 0.0052	0.0073
Total Dissolved Solids	mg/L	3/6/2014	16000	3200 / 3200	3400	3100		6900	2500	3200
		5/19/2014	9000	2700	4800	3100		2500	6000	3300 / 3300
		9/23/2014	12000	3300	2200	3100	3600	6800	2800 / 2800	3500
Total Suspended Solids	mg/L	3/6/2014	49	31 / 32	27	32		17	27	37
		5/19/2014	30	25	92	20 U		27	28	27 / 20 U
		9/23/2014	270	58	20 U	21	20 U	730	41 / 59	31
Zinc Dissolved	mg/L	3/6/2014	1000	18 / 18	64	29		39	16	21
		5/19/2014	990	79	150	32		17	38	82 / 88
		9/23/2014	980	42 J	29	38	78	44	20 / 21	41
Zinc Total Rec.	mg/L	3/6/2014	1000 B	19 B / 19	66 B	31 B		40 B	16 B	22 B
		5/19/2014	1800	77	150	36		15	38	88 / 84
		9/23/2014	930	41 J	32	40	80	57	20 / 20	42
Alkalinity Total	mg/L	3/6/2014	1.1 U	170 JB / 140 JB	1.1 U	100 JB		110 JB	200 JB	68 JB
		5/19/2014	5 U	18	5 U	81		170	36	5 U / 5 U
		9/23/2014	5 U	130	43	110	5 U	110	250 / 240	27

U - Undetected at stated detection limit J - Estimated value
B - High concentrations found within the associated laboratory blank

Mine, Seep, and Groundwater Quality Report

Eagle Mine Site, 2014

PARAMETER	UNITS	Sample Date	BW-10 BELDEN GROUNDWATER WELL	MS- 5 MDD (ADIT #5)	S- 5 SEEPAGE FROM ADIT NO. 5	S- 6 SEEP- ADJ. ROCK CRK CULVERT INLET	S-TT SEEPAGE FROM TIP TOP ADIT	E-SUMP SUMP OF EAST CTP EXTRACT TRENCH	N-SUMP SUMP OF NORTH CTP EXTRACT TRENCH	WTP-INF WTP INFLUENT
Ammonia Dissolved	mg/L	3/6/2014	2	0.16 / 0.16	0.074 J	0.16		1.8	2	0.49
		5/19/2014	0.62 U	0.11	0.1 U	0.14		1.4	0.65	0.26 / 0.27
		9/23/2014	0.38	0.14	0.11	0.13	0.1 U	0.76	1.4 / 1.4	0.32
Bicarbonate Dissolved	MG/L	9/23/2014	5 U	130	43	110	5 U	110	250 / 240	27
Carbonate	MG/L	9/23/2014	5 U	20 U	20 U	20 U	5 U	20 U	20 U / 20 U	5 U
Chloride Dissolved	mg/L	3/6/2014	3.9 J	8.3 / 8.3	4.6 J	8.1		21	34	12
		5/19/2014	12	11	17	9.3		30	17	11 / 12
		9/23/2014	20 U	13	6.8	11	6.2	21	35 / 34	14
Cyanide	mg/L	3/6/2014	0.2 U	0.0029 J / 0.0025 J	0.002 U	0.002 U		0.003 J	0.0084 J	0.0028 J
		5/19/2014	0.01 U	0.01 U	0.01 U	0.01 U		0.01 U	0.01 U	0.01 U / 0.01 U
		9/23/2014	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.022 / 0.01 U	0.01 U
Fluoride Dissolved	mg/L	3/6/2014	4.8	0.56 / 0.65	1	0.44 J		0.15 J	0.84	0.5
		5/19/2014	5.2	2.5 U	5 U	2.5 U		2.5 U	5 U	2.5 U / 2.5 U
		9/23/2014	10 U	2.5 U	2 U	2.5 U	2.5 U	5 U	2.5 U / 2.5 U	2.5 U
Lab pH	su	3/6/2014	2.39 Field	6.15 Field / 6.18 Field	3.32 Field	6.33 Field		6.05 Field	6.68 Field	6.3 Field
		5/19/2014	2.46	5.19	3.29	6.49		6.46	5.55	3.45 / 3.47
		9/23/2014	3.09	6.01	6.44	6.38	3.11	5.73	6.44 / 6.43	5.88
Nitrate	mg/L	3/6/2014	0.55 J	0.042 U / 0.042 U	0.084 U	0.042		0.084 U	0.042 U	0.042 U
		5/19/2014	10 U	5 U	10 U	5 U		5 U	10 U	5 U / 5 U
		9/23/2014	20 U	5 U	4 U	5 U	5 U	10 U	5 U / 5 U	5 U
Sulfate	mg/L	3/6/2014	34000	2200 / 2600	3300	2300		6500	1700	2400
		5/19/2014	6100	1800	3400	2000		1500	3800	2200 / 2200
		9/23/2014	6800	2200	1500	2100	2400	4600	1800 / 1800	2300
Anions	meq/L	3/6/2014	-708	-49.45 / -57.18	-68.87	-50.13		-138.13	-40.37	-51.68
		5/19/2014	-127.61	-37.74	-70.39	-43.21		-35.85	79.42	-46.44 / -47.05
		9/23/2014	141.75	48.51	31.71	45.99	51.06	99.11	42.75 / 42.51	47.98
Cations	meq/L	3/6/2014	196.19	50.63 / 51.53	51.75	47.04		107.26	43.46	49.77
		5/19/2014	135.04	37.98	62.63	46.21		38.96	86.46	46.12 / 46.3
		9/23/2014	133.6	51.1	31.7	44.8	56.7	109.86	45.44 / 45.47	47.16
Net Balance	%	3/6/2014	-0.566	1.18 / 5.19	-0.142	-0.032		-0.126	3.7	-0.0189
		5/19/2014	5.66	0.0063	-0.1167	-0.0672		-0.0833	-0.0848	-0.0067 / -0.0161
		9/23/2014	5.92	5.2	0.06	2.61	10.47	10.29	6.1 / 6.72	1.71
Iron Ferrous (Fe+2)	mg/L	3/6/2014	400 Field	57 Field / 120 Field	130 Field	68 Field		330 Field	120 Field	89 Field
Dissolved Oxygen	mg/l	3/6/2014	3.08	0.82	4.35	5.29		2.37	2.57	5.22
		5/19/2014	15.3	6.9	14.7	13.13		6.85	8.15	11.81
		9/23/2014	6.5	20.4	49.9	61	3.2	3.78	31.06	4.3
Field pH	SU	3/6/2014	2.31	5.95	3.45	6.1		5.84	6.33	6.23
		5/19/2014	3.3	5.47	3.79	6.02		6.2	5.68	4.34
		9/23/2014	3.14	6.01	6.64	6.5	3.3	6.18	6.81	5.93
Field Temperature	deg C	3/6/2014	9.3	18.6	13.4	8.9		15.9	9.4	13.5
		5/19/2014	7.74	19.68	12.49	10.87		13	13.66	15.2
		9/23/2014	7.3	20.4	11.15	9.22	10.14	15.99	15.66	15.87

U - Undetected at stated detection limit J - Estimated value
B - High concentrations found within the associated laboratory blank

Mine, Seep, and Groundwater Quality Report

Eagle Mine Site, 2014

PARAMETER	UNITS	Sample Date	BW-10 BELDEN GROUNDWATER WELL	MS- 5 MDD (ADIT #5)	S- 5 SEEPAGE FROM ADIT NO. 5	S- 6 SEEP- ADJ. ROCK CRK CULVERT INLET	S-TT SEEPAGE FROM TIP TOP ADIT	E-SUMP SUMP OF EAST CTP EXTRACT TRENCH	N-SUMP SUMP OF NORTH CTP EXTRACT TRENCH	WTP-INF WTP INFLUENT
ORP	mv	9/23/2014	366.9	55.1	26.4	28	416.4	-20.5	-55.3	68.7
		5/19/2014	385	1.08	405.4	-16.6		-82.7	-9.7	22407
Spec. Cond. Field @25C	umhos/cm	3/6/2014	9220	3080	3290	3170		4060	2790	3110
		5/19/2014	5054	2216	2970	2050		1937	3455	2428
		9/23/2014	9162	3595	2473	3347	3744	6323	3352	3519

U - Undetected at stated detection limit J - Estimated value
B - High concentrations found within the associated laboratory blank

B-3 Liberty Well No. 4 Water Quality Reports
Eagle Mine Site
2014

Liberty Well No. 4 Water Quality Report

Eagle Mine Site, January - December 2014

Station ID and Description / Sample Date and Time	Field pH (SU)	Field Temp. (Deg. C)	Field Spec. Cond. @25C (umhos/cm)	TSS (mg/L)	TDS (mg/L)	Chloride (mg/L)	Hydrogen Sulfide (mg/L)	Mercury (mg/L)	Arsenic Total (mg/L)	Cadmium Pot. Diss. (mg/L)	Copper Diss./PD (mg/L)	Lead Pot. Diss. (mg/L)	Manganese Dissolved (mg/L)	Selenium Pot. Diss. (mg/L)	Zinc Diss./PD (mg/L)
LIB- 4 *LIBERTY WELL AT WILLOW CREEK*															
1/16/2014 15:30	7.6	10	447	5 U	--	--	--	--	--	--	0.002 U / --	--	0.0582	--	0.0847 / --
2/12/2014 9:56	7.26	12.8	479	5 U	--	--	--	--	--	--	0.002 U / --	--	0.0541	--	0.074 / --
3/6/2014 13:00	7.57	13.2	462	5 U	--	--	--	--	0.002	0.00019	0.002 U / 0.002 U	0.0022	0.0212	0.003	0.0561 / 0.0668
4/2/2014 11:22	7.33	12.4	480	5 U	--	--	--	--	--	--	0.002 U / --	--	0.0232	--	0.0631 / --
4/16/2014 12:13	7.36	12.7	479	5 U	--	--	--	--	--	--	0.002 U / --	--	0.0256	--	0.0666 / --
5/1/2014 9:40	7.35	12.2	494	5 U	--	--	--	--	--	--	0.002 U / --	--	0.021	--	0.0728 / --
6/11/2014 10:12	7.76	14.8	463	--	--	--	--	--	--	--	0.002 U / --	--	0.0181	--	0.0772 / --
6/25/2014 13:10	7.45	15.1	459	5 U	--	--	--	--	--	--	-- / --	--	--	--	-- / --
7/8/2014 12:00	7.76	15.1	460	5 U	--	--	--	--	--	--	0.002 U / --	--	0.0256	--	0.0839 / --
8/20/2014 12:06	7.61	15.2	452	5 U	--	--	--	--	--	--	0.002 U / --	--	0.0315	--	0.0877 / --
9/4/2014 8:15	7.63	13.8	452	5 U	--	--	--	--	--	--	0.0193 / --	--	0.0248	--	0.0747 / --
10/8/2014 12:13	7.6	15.6	443	5 U	268	1.3	0.5 U	0.0000073	0.0023	0.00023	-- / 0.002 U	0.002	--	0.0029	-- / 0.0846
12/11/2014 12:29	7.51	13.2	443	5 U	--	0.75	--	--	0.0019	0.00018	-- / --	0.0022	--	0.0029	-- / --
12/18/2014 10:54	7.65	12.5	468	5 U	--	--	--	--	0.0021	0.00021	-- / --	0.002	--	0.0029	-- / --

U - Undetected at stated detection limit
J - Estimated value

See next page for additional metal results for the 3/6/14 sample

Water Quality Report for 2014 NDPES Permit Application

Liberty Well (LIB-4) and Willow Creek

Parameter	Units	Liberty Well (LIB-4)			Willow Creek (WC-0) above LIB-4		
Solids, Total Suspended	mg/l		< 5.0			< 5.0	
Sulfide	mg/l		< 0.50			< 0.50	
Nitrogen, Nitrite	mg/l		< 0.0040			< 0.0040	
Nitrogen, Nitrate	mg/l		0.071			0.17	
Sulfate	mg/l		57.2			15.6	
Mercury	ug/l		< 0.10			< 0.10	
Metals		**Total Recoverable**	**Potentially Dissolved**	**Dissolved**	**Total Recoverable**	**Potentially Dissolved**	**Dissolved**
Arsenic	ug/l	2.0	2.2		< 0.20	< 0.20	
Boron	ug/l	< 40			< 40		
Cadmium	ug/l		0.19			< 0.10	
Calcium	ug/l			50400			30900
Chromium	ug/l	< 2.0			< 2.0		
Copper	ug/l		< 2.0	< 2.0		< 2.0	< 2.0
Hardness	mg/l			211			138
Iron	ug/l	21.4	< 10		< 10	< 10	
Lead	ug/l		2.2			< 0.50	
Magnesium	ug/l			20700			14700
Manganese	ug/l		21.8	21.2		1.3	< 1.0
Nickel	ug/l		< 2.0			< 2.0	
Selenium	ug/l		3.0			< 0.40	
Silver	ug/l		< 0.10			< 0.10	
Zinc	ug/l		66.8	56.1		12	< 10
Field Measurements							
pH	SU		7.57			7.74	
Temperature	deg C		13.2			2.0	
Specific Conductance @ 25 deg C	umhos/cm		462			299	
TDS based on SC	mg/l		296			191	
Flow	gpd (gpm)		205,920 (143)			Ice Affected	

Notes:

TDS (total dissolved solids) and SC (specific conductance) are reasonably comparable. For water for agricultural and irrigation purpose the values for EC and TDS are related to each other and can be converted with an accuracy of about 10%. Conversions of the measured SC to approximate TDS were made using the calculator convertor at http://www.lenntech.com/calculators/conductivity/tds-engels.htm

< - Undetected at the stated detection limit

APPENDIX C

GROUNDWATER DATA

C-1 Groundwater Elevation Data
Eagle Mine Site
January – December 2014

Groundwater Elevation Data

Eagle Mine Site, January - December 2014

Well ID	DATE	Measuring Point Elevation (ft MSL)	Depth to Water (feet)	Elevation (ft MSL)	
BTS-1					
	2/25/2014	8,381.18	14.40	8,366.78	
	3/20/2014	8,381.18	12.00	8,369.18	
	3/25/2014	8,381.18	11.45	8,369.73	
	4/3/2014	8,381.18	11.90	8,369.28	
	4/16/2014	8,381.18	11.61	8,369.57	
	5/15/2014	8,381.18	12.26	8,368.92	Pulled transducer
	5/29/2014	8,381.18	14.40	8,366.78	
	6/16/2014	8,381.18	14.90	8,366.28	
BW- 9R					
	2/25/2014	8,380.49	18.80	8,361.69	
	6/16/2014	8,380.49	15.80	8,364.69	
BW-10					
	3/6/2014	8,377.34	18.00	8,359.34	
	5/19/2014	8,377.34	16.00	8,361.34	
EDS-3					
	4/3/2014	8,300.08	11.90	8,288.18	
ET- 1					
	1/9/2014	7,993.37	10.00	7,983.37	Est
	1/13/2014	7,993.37	10.00	7,983.37	Est
	1/17/2014	7,993.37	10.10	7,983.27	
	1/20/2014	7,993.37	10.00	7,983.37	
	1/28/2014	7,993.37	10.10	7,983.27	
	2/6/2014	7,993.37	10.10	7,983.27	
	2/11/2014	7,993.37	10.15	7,983.22	
	2/21/2014	7,993.37	10.00	7,983.37	
	2/25/2014	7,993.37	10.06	7,983.31	
	3/5/2014	7,993.37	9.65	7,983.72	
	3/12/2014	7,993.37	9.40	7,983.97	
	3/19/2014	7,993.37	9.60	7,983.77	
	4/2/2014	7,993.37	9.20	7,984.17	
	4/10/2014	7,993.37	5.05	7,988.32	East Trench bldg flooded
	4/17/2014	7,993.37	7.65	7,985.72	
	4/21/2014	7,993.37	6.75	7,986.62	
	4/28/2014	7,993.37	7.85	7,985.52	
	5/5/2014	7,993.37	8.55	7,984.82	
	5/13/2014	7,993.37	8.30	7,985.07	
	5/21/2014	7,993.37	7.70	7,985.67	
	5/27/2014	7,993.37	7.50	7,985.87	
	6/9/2014	7,993.37	7.10	7,986.27	
	6/17/2014	7,993.37	7.40	7,985.97	
	7/2/2014	7,993.37	8.81	7,984.56	
	7/8/2014	7,993.37	9.05	7,984.32	
	7/14/2014	7,993.37	9.20	7,984.17	
	7/21/2014	7,993.37	9.30	7,984.07	

Groundwater Elevation Data

Eagle Mine Site, January - December 2014

Well ID	DATE	Measuring Point Elevation (ft MSL)	Depth to Water (feet)	Elevation (ft MSL)	
ET- 1					
	7/29/2014	7,993.37	9.40	7,983.97	
	7/29/2014	7,993.37	9.37	7,984.00	pulled ducer at 13:10
	8/4/2014	7,993.37	9.82	7,983.55	
	8/9/2014	7,993.37	9.45	7,983.92	placed ducer
	8/11/2014	7,993.37	9.50	7,983.87	
	8/20/2014	7,993.37	9.65	7,983.72	
	8/28/2014	7,993.37	8.60	7,984.77	
	9/2/2014	7,993.37	8.25	7,985.12	
	9/10/2014	7,993.37	9.30	7,984.07	
	9/15/2014	7,993.37	9.70	7,983.67	
	9/22/2014	7,993.37	9.90	7,983.47	
	9/30/2014	7,993.37	9.85	7,983.52	
	10/10/2014	7,993.37	9.30	7,984.07	
	10/15/2014	7,993.37	9.80	7,983.57	
	11/3/2014	7,993.37	10.00	7,983.37	
	11/10/2014	7,993.37	10.00	7,983.37	
	11/19/2014	7,993.37	9.80	7,983.57	
	11/25/2014	7,993.37	10.00	7,983.37	
	12/1/2014	7,993.37	10.00	7,983.37	
	12/9/2014	7,993.37	10.00	7,983.37	
	12/15/2014	7,993.37	10.00	7,983.37	
	12/26/2014	7,993.37	9.80	7,983.57	

C-2 CTP Groundwater Extraction System
Eagle Mine Site
January – December 2014

CTP Groundwater Extraction System

Eagle Mine Site, January - December 2014

Month	Tot. Gallons Pumped per Month	Cumulative Gallons Pumped for the Year	Cumulative Gallons Pumped
January	976,728	976,728	383,500,171
February	723,123	1,699,851	384,223,293
March	764,846	2,464,697	384,988,139
April	1,237,504	3,702,201	386,225,643
May	1,263,110	4,965,311	387,488,753
June	926,860	5,892,171	388,415,613
July	797,904	6,690,075	389,213,517
August	889,206	7,579,281	390,102,723
September	965,283	8,544,564	391,068,006
October	837,985	9,382,549	391,905,991
November	731,618	10,114,167	392,637,609
December	843,911	10,958,078	393,481,520

Notes:

North and East Trenches combined total gallons is measured via a flow meter at the surge pond.

C-3 Upgradient Groundwater Diversion Trench
Eagle Mine Site
2014

Upgradient Groundwater Diversion Trench

Eagle Mine Site, 2014

Monitoring Location	Date	Flow (gpm)	Stage/ Level (ft.)	Field pH (Std Units) >6.0 *	Field Temperature (Deg. C)	Field Spec. Cond. @ 25C (umhos/cm) <850 *
UGDT	*Flowed from 4/??/14 to 8/18/14*					
	April-14	*under snow*				
	4/23/2014	13.2	0.17	6.3	4.5	509
	5/1/2014	14.8	0.18	6.5	4.5	508
	5/5/2014	14.8	0.18	6.6	5.2	512
	5/14/2014	20.2	0.21	6.6	5.6	534
	5/21/2014	18.3	0.20	6.8	6.3	554
	5/28/2014	16.5	0.19	6.9	7.5	587
	6/3/2014	14.8	0.18	6.8	8.9	594
	6/9/2014	14.8	0.18	7.1	8.9	580
	6/17/2014	11.7	0.16	7.0	9.8	548
	6/26/2014	11.7	0.16	7.1	11.3	568
	7/2/2014	13.2	0.17	7.1	11.9	584
	7/8/2014	14.8	0.18	R	12.2	596
	7/17/2014	13.2	0.17	7.2	14	611
	7/21/2014	11.7	0.16	7.0	13	623
	7/30/2014	6.6	0.12	7.1	13.9	631
	8/6/2014	1.6	0.06	7.1	14.7	639
	8/11/2014	0.2	0.02	7.1	14.5	641
	8/19/2014		No Flow			

Note

*Operational/maintenance standard - action required, see O&M Plan