100001099 - R8 SDMS

SECOND FIVE-YEAR REVIEW REPORT
FOR THE
UPPER TENMILE CREEK MINING AREA SUPERFUND SITE
LEWIS AND CLARK COUNTY, MONTANA

Prepared by:

U.S. Environmental Protection Agency
Region 8
Denver, Colorado

Betsy Smidinger
Assistant Regional Administrator
Office of Ecosystems Protection
and Remediation

8/2/17
Date

Table of Contents

LIST OF TABLES

LIST OF ATTACHMENTS

List of Acronyms

AMD	Acid Mine Drainage
amsl	Above mean sea level
ARARs	Applicable or Relevant and Appropriate Requirements
BCM	Basin Creek Mine
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
cfs	Cubic feet per second
CMP	Compliance Monitoring Plan
COCs	Contaminants of Concern
COPCs	Contaminants of Potential Concern
CTE	Central tendency exposure
cy	Cubic Yards
DEQ	Montana Department of Environmental Quality
EPA	United States Environmental Protection Agency
ERA	Ecological Risk Assessment
ESD	Explanation of Significant Difference
Ft/min	feet per minute
HHRA	Human Health Risk Assessment
IC	Institutional Control
MCL	Maximum Contaminant Level
mg/Kg	Milligram Per Kilogram
mg/L	Milligram Per Liter
NCP	National Contingency Plan
NPL	National Priority List
OLEM	Office of Land and Emergency Management
OU	Operable Unit
RA	Removal Action
RAO	Remedial Action Objective
RME	reasonable maximum exposure
ROD	Record of Decision
SOW	Scope of Work
TAG	Technical Assistance Grant
TBC	To Be Considered
USACE	United States Army Corps of Engineers
USFS	United States Forest Service
USGS	United States Geological Survey
ug/L	Microgram per Liter

Executive Summary

The U.S. Environmental Protection Agency (EPA), Region 8, with support from the Omaha District of the United States Army Corps of Engineers, has completed the second Five-Year Review of the Upper Tenmile Creek Mining Area National Priorities List (NPL) Site, located in Lewis and Clark County, Montana. This Five-Year Review is required to meet the statutory mandate under CERCLA § 121 (c). The triggering action for this second Five-Year Review was the completion of the first Five-Year Review report on July 31, 2008.The second Five-Year Review covers the period July 2008 to July of 2013. CDM-Smith has been the EPA Prime Contractor for Remedial Design and Remedial Action for this Site.

The Record of Decision (ROD) issued in June of 2002 indicates that the selected remedy for the Upper Tenmile Creek Mining Area NPL site (the Site) near Helena, Montana includes: excavation, disposal, and reclamation of contaminated residential soils, roads and mine wastes (solid media); Source Adit Control which involves the reduction and/or treatment of Source Adit Discharge/Acid Mine Drainage (AMD) as well as the associated mine influenced groundwater from the former mines (liquid media); provision of a surface water derived Drinking Water System for the Rimini Community (per the ROD Amendment of September 2008); implementation of Institutional Controls (ICs) for all forms of media having waste left in place, and construction elements to promote the augmentation of Upper Tenmile Creek during low-flow periods as well as provide monitoring of surface water quality.

This Five-Year Review examines the protectiveness of the remedy completed through July 2013 including: remediation of residential yards (92.5% complete: the remaining properties will require Institutional Controls unless access and/or legal issues are resolved), Rimini Road (100% complete), and clean-up progress of the 70 high priority mine waste sites (to date focused on cleanup of priority mine waste sites near residences). Pending elements of the remedy include: Source Adit Discharge Control which includes both mine influenced groundwater and acid mine drainage reduction/remediation, Engineering Controls for protectiveness of Chessman Reservoir and Red Mountain Flume, implementation of institutional controls (ICs) for all media with waste left in place including a Controlled Groundwater Area, all measures to achieve standards for surface water and the construction of a permanent water supply for the community of Rimini.

The data collected in support of the investigation of potential Residential Soils Remediation projects resulted in the need for remedial activities to meet ROD criteria for remedial action at sixty-seven properties (20 in the Landmark Subdivision and 47 in the Rimini Community). As clarified in the first Five-Year Review: "Some residential properties were only partially remediated due to access denial and protection of valuable vegetation and septic systems. These properties were assessed for remedy protectiveness in their current condition. The methodology calculated an area- weighted mean arsenic and lead concentration for each property and compared those concentrations against the corresponding cleanup levels of 120 milligrams per kilogram (mg/kg) and 1,000 mg/kg, respectively. The results of these calculations indicate that many of the properties have area weighted mean arsenic and lead concentrations below cleanup levels and therefore, are protective of human health in their current condition." Further, there are no instances where lead levels exceeded 400 ppm and arsenic levels were found to be below cleanup levels (120 ppm): basically, arsenic is the 'driver' for cleanup action and given that the contaminates of concern are co-located mining waste when one is removed, both are removed.

EPA obligated funding for Lewis & Clark County to provide personnel to be involved in a coordinated effort to implement the remedial action objective of Institutional Controls and a Controlled Groundwater Area. EPA will need full participation by all parties to meet the Institutional Controls objectives by the next five-year review.

The January 2011 "Five-Year Review Highlights since 2008" indicated: a Record of Decision (ROD) Amendment was completed in 2008 in which "a potable water supply derived from surface water for the Community of Rimini" was selected; the 2002 ROD had indicated that a community waste water system was required but the approach was abandoned in the 2008 ROD Amendment and individual septic systems were constructed; the Remedial Action for Rimini Road, a.k.a. Banner Creek Road, was completed in 2010.

Work continues on the High Priority Mine Waste Rock/Tailings Sites. EPA is focused on addressing High Priority Mine Waste Sites near the residents and/or that contribute source adit discharge and/or mine influenced groundwater to potential drinking water sources or surface water. Previous efforts included the mill sites in the Landmark Subdivision and the Lee Mountain mine waste site. The total volume remediated, as of the completion of field work in 2012 is 67,000 cubic yards. The remainder of the Lee Mountain/ Little Lily Complex was scheduled for completion in the Fall of 2013 (the last of the solid media mine waste located in the Rimini Community that has been identified for remediation) and those data are beyond the scope of this review through July 2013.

The 2008 ROD Amendment required EPA to discontinue using the constructed Community Wastewater System. This increased residential soils remediation time due to need for construction of property specific septic systems.

Though much progress has taken place to address overall Site protectiveness, all exposure pathways and sources defined in the Record of Decision have not been remediated.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Upper Tenmile Creek Mining Area Superfund Site, Operable Unit 4		
EPA ID: MTSFN7578012		
Region: 8	**State:** Montana	**City/County:** Lewis and Clark County

SITE STATUS	
NPL Status: Final	
Multiple OUs? YES: the Remedy indicates that "OU4 – Watershed" will contain all Site OUs elements and construction	**Has the site achieved construction completion?** No

REVIEW STATUS
Lead agency: EPA
Author name (Federal or State Project Manager): Tillman McAdams
Author affiliation: US EPA, Region 8
Review period: 10/01/2012 – 02/01/2017
Date of site inspection: 10/18/2012
Type of review: Statutory
Review number: 2
Triggering action date: 07/31/2008
Due date *(five years after triggering action date)*: 07/31/2013

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the Five-Year Review:
None – OU4 encompasses all of the other OUs

Issues and Recommendations Identified in the Five-Year Review:	
OU(s): 04	**Issue Category: Remedy Performance**

	Issue: There is potential that Landmark or Rimini residential water supply(ies) may contain contaminants above MCLs at homes where landowners have declined offers of either bottled water or point-of-use water treatment systems.			
	Recommendation: Continue to supply bottled water to residents that have wells with levels above MCLs and will accept bottled water. Given that the Landmark Subdivision wells are highly influenced by Tenmile Creek and the Rimini Community Drinking Water System is to be developed using surface water from Tenmile Creek (2008 ROD Amendment), the drinking water remedy is best designed after Source Adit Discharges highly influencing surface water in Tenmile Creek are remediated. Continue outreach and education of residents about their exposure risks. Work with MDEQ, DNRC and Lewis & Clark County to implement a Groundwater Control Area.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
Yes	Yes	EPA	EPA	July 2023

OU(s): 04	**Issue Category: Remedy Performance**			
	Issue: Remediation of 62 of 67 residential properties (92.5%) identified for remedial action have been completed (83,000 cubic yards removed and reclaimed with waste placed in Luttrell Repository) and sufficient work has been done to create a condition that is protective of human health. However, the remaining 5 properties that have been partially remediated or not remediated due to Legal or Access issues, still are not protective of human health thus require resolution of Access & Remediation or Implementation of Institutional Controls.			
	Recommendation: Continue to work with landowners and local government to secure property access for the purpose of completing remedial action for the remaining 5 properties, as necessary to protect human health. However, access limitations may preclude completion of all yards thus Institutional Controls (requires Lewis & Clark County participation) may be required for the 'waste left in place'. Continue outreach and education about exposure risks.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
Yes	Yes	EPA	EPA	EPA July 2018

OU(s): 04	**Issue Category: Monitoring**			
	Issue: Performance standards and points of compliance have not been formalized under a Compliance Monitoring Plan (CMP) for the Luttrell repository ground water monitoring network or treatment facility effluent discharge.			
	Recommendation: Develop a formal CMP from existing EPA monitoring points and USGS monitoring wells (compliance wells) data.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
Yes	Yes	EPA	EPA	July 2017

OU(s): 04	Issue Category: Remedy Performance			
	Issue: Remediation of High Priority, Per Table 9-1 of the ROD "Category C, D, & E", mine waste sites (solid media) is not completed.			
	Recommendation: Primary focus has been the High Priority Mine Waste sites located near residential areas (i.e. Lee Mountain and the Mill sites in Landmark Subdivision). Group the remaining mine waste sites and rank the groups by remedial priority then continue until remediation of all ROD defined High Priority Mine Waste Sites has been completed.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	EPA	EPA	EPA July 2023

Protectiveness Statement

Operable Unit:	*Protectiveness Determination:*	*Addendum Due Date (if applicable):*
OU4	Will Be Protective	

The remedy at OU4 is expected to be protective of human health and the environment upon completion. In the interim, remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risks associated with those specific portions of the project.

Upper Tenmile Creek Mining Area NPL Site
Lewis and Clark County, Montana
Second Five-Year Review Report

I. Introduction

The purpose of the Five-Year Review is to determine whether the implementation and performance of a remedy at a site is or will be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and makes recommendations to address them.

The U.S. Environmental Protection Agency (EPA), Region 8 is preparing this second Five-Year Review report pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) §121 and the National Contingency Plan (NCP). CERCLA §121 states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

The EPA interpreted this requirement further in the NCP; 40 Code of Federal Regulations (CFR) §300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

The EPA Region 8, with support from the Omaha District of the U.S. Army Corps of Engineers (USACE), has conducted the second Five-Year Review of remedy implemented at Upper Tenmile Creek near Helena, Montana. This Site wide review was conducted from October 2012 through July 2013.

The triggering action for this review is the signature date of the previous Five-Year report, July 31, 2008. Due to problems experienced in getting documentation from the five-year review contractor and a change in Remedial Project Manager during that timeframe, completion of the five-year review report was delayed.

II. Site Chronology

Table 1 Chronology of Site Events

Event	Date
Active hard rock mining in Rimini Mining District.	1870's - 1953
Basin Creek open pit gold mine closes (includes Luttrell Pit).	1990's
Removal and Reclamation activities by MTDEQ at 11 mine sites.	1987 - 1990
DEQ investigates an additional 17 mines.	1993 - 1994
EPA Removal Action at residential area in lower watershed.	1995
EPA Removal Action at Red Water Mine with capping of mine wastes.	Fall 1997
Luttrell Pit converted to Luttrell Waste Repository.	1999
Site proposed for the NPL.	July 1999
Removal Actions at Red Mountain and Bunker Hill mines.	Summer 1999
NPL Listing.	October 1999
Removal Action for Peerless Jenny/King complex, Susie, and Red Mountain mines.	Summer 2000
RI/FS conducted.	2000 - 2001
Final Ecological Risk Assessment.	April 2001
Final Human Health Risk Assessment	October 2001
Proposed Plan issued.	October 2001
Record of Decision (ROD) issued.	June 2002
Remedial Action at Landmark Subdivision and Lee Mountain mine.	2003 - 2004
Rimini waste water treatment system construction commences.	2005
Residential yard clean-up at Rimini.*	2006-2013
Proposed Plan for Rimini community issued	Oct. 2007
First Five-Year Review	July 2008
ROD amendment issued. Rimini waste water treatment system cancelled.	Sept. 2008
Rimini Road Remedial Action	2010
Lee Mountain/Little Lily Mine Complex	2012-13

III. Background

Physical Characteristics

The Site is located primarily within Lewis and Clark County, southwest of Helena, Montana (**Attachment 1**). The Site consists of approximately 53 square miles and includes the Upper Tenmile Creek watershed and the community of Rimini (**Attachment 2**). From its headwaters, Tenmile Creek flows 28 miles before entering Lake Helena. Only the upper 13 miles are located in the Site. The Site lies within the Northern Rocky Mountain physiographic province, which is characterized by a succession of distinct mountains and valleys. Tenmile Creek originates at the continental divide at an elevation of 7,200 above mean sea level (amsl) and drops to 4,380 feet amsl at the northern boundary of the Site near the confluence with Sweeney Creek.

Seasonal surface water flow in the watershed is highly variable. Flow predictions, based on hydrologic modeling and 30-year flow trends yield estimated seasonal flows of 3.9 cubic feet per second (cfs) to 122 cfs. Actual flows at the downstream end of the Site are considerably less due to withdraw by the Helena water supply system. During mid- to late summer, measured flows are often below 5 cfs, with certain reaches dewatered completely. Minimum flows to sustain the aquatic ecosystem have been estimated at 4 cfs. This evaluation is based on historical information developed from USGS surface water monitoring locations upstream and downstream of the City of Helena intake diversion (**Attachment 3**).

Groundwater flow in upland areas is through fractures, fissures and voids in competent bedrock towards the valley bottom where it discharges to unconsolidated valley-bottom materials along the stream channels. Groundwater in unconsolidated valley-bottom materials may subsequently resurface as a contaminant source to surface water. Regional groundwater flow is generally to the north.

Land and Resource Use

With the exception of the community of Rimini; a small residential subdivision (Landmark) at the mouth of the watershed and a few recreation cabins, the Site is largely undeveloped land used for recreation. Anticipated future land use is largely the same as the current land use. The City of Helena has relied upon upper Tenmile Creek watershed as a source of potable water for over 100 years. Raw water is supplied to the Tenmile Water Treatment Plant via a gravity pipeline that collects water from intake structures located on Tenmile Creek and its tributaries. The upper Tenmile Creek watershed supplies about 85 percent of the City of Helena's drinking water.

History of Contamination

The Site includes 150 abandoned or inactive mine sites within or near the historic Rimini Mining District. Most historic mining activity took place within the Rimini Mining District and included hard rock mining for gold, lead, zinc, and copper. Active hard rock mining began in the 1870's and continued through the 1950's. The Site also includes the properties of the now defunct Basin Creek Mine (BCM), an open pit gold mine that operated until the mid-1990s. Waste rock and tailings contamination is generally limited in lateral and vertical extent to discrete waste areas in the general vicinity of waste rock piles at individual mine sites. The density of these mine sites is greatest in the vicinity of Rimini.

Contaminants are released from mine waste rock piles and tailings piles through surface water runoff, wind and water erosion, infiltration/ leaching to groundwater, biotic uptake, or waste transport by human activity. Adits discharge contaminants to surface water or leach them to groundwater. These releases result in contamination of media, such as surface soil, surface water, stream sediment, and groundwater that then become secondary sources. The secondary sources release contaminants in a number of ways. Contaminants in surface water may be released to sediments (through precipitation, deposition, and adsorption), biota (through uptake), and groundwater (through infiltration). Contaminants in soil are released primarily to biota (through uptake), air (wind-generated dust), or interior dust (tracking). Contaminants in groundwater may discharge to surface water, and contaminants in sediment may be released to surface water (through adsorption/desorption) and biota (through uptake). Cycling of contaminants among site media will also occur. For example, metals may partition between surface water and sediments and migrate between surface water and groundwater in gaining and losing stream reaches.

Initial Response

Pre-NPL Listing Removal/Cleanup Actions:

- 1987-1990: Montana Department of State Lands (now Montana Department of Environmental Quality (DEQ)) removed waste rock and tailings material from eleven abandoned mine sites and disposed of the materials at an active mine in Jefferson County. At each of the mine sites, the land was re-contoured, stabilized in-place, covered and re-vegetated. Adit discharges associated with the mine sites were not addressed by this action.
- 1995: EPA conducted a removal of waste materials in a residential area near the Lower Tenmile Mill Site.
- 1997: EPA relocated 9,500 cubic yards (cy) of mine waste away from a residence at the Red Water Mine.

Pre-ROD Removal Actions:

- June 1999: The Luttrell Repository, located at the bankrupt Basin Creek Mine, was established as the repository for mine wastes excavated from the Site and Basin Superfund Sites. Engineering designs for the repository include multiple waste disposal cells with permanent top and bottom liners and a leachate collection system. The leachate flows to a lined pond where it is treated prior to discharge.
- Summer 1999: EPA relocated 50,000 cy of mine waste from the Red Mountain Mine to the Luttrell Repository.
- Summer 2000: EPA and USFS relocated mine wastes from the Peerless Jenny/King complexes, Susie, Red Mountain, Armstrong, Beatrice and Justice Mine sites and the Minnehaha drainage to the Luttrell Repository.
- Summer 2001: EPA and USFS relocated mine wastes from Bunker Hill, Queensbury, and Upper Valley Forge mine sites to the Luttrell Repository. EPA conducted surface reclamation work at Red Mountain, Bunker Hill, Susie, Jenny/King and Queensbury sites.

Basis for Taking Action

Chemicals of potential concern (COPCs) in surface water, adit discharge, groundwater, waste rock/tailings, surface and sediment were quantitatively evaluated in the Human Health Risk Assessment (HHRA) using standard methodologies. Of the original 17 COPCs, only four were carried through in the ROD as chemicals of concern (COCs). These COCs are presented in **Table 2** by appropriate media.

Table 2 Summary of Chemicals of Concern for Human Health Risk

Chemical	Surface Soil	Groundwater	Surface Water	Sediment
Arsenic	x	x	x	x
Cadmium		x	x	
Lead	x	x	x	
Zinc			x	x

Note: Surface soil includes waste rock/tailings; surface water includes adit discharge

A total of 17 COPCs were identified in the ecological risk assessment (ERA), based on several established criteria. **Table 3** below lists the eight chemicals identified as ecological COCs for surface water, sediment and soils.

Table 3 Summary of Chemicals of Concern for Ecological Risk

Chemical	Surface Soil	Surface Water	Sediment
Arsenic	X	x	x
Cadmium	X	x	x
Chromium	X		
Copper	X	x	x
Iron	X	x	x
Lead	X	x	x
Manganese	X	x	x
Zinc	X	x	x

Note: Surface soil includes waste rock; surface water includes adit discharge.

IV. Remedial Actions

Remedy Selection

The Site has been divided into nine operable units (OUs) including:

- OU0 – Sitewide
- OU1 – Red Mountain Mine
- OU2 – Bunker Hill Mine
- OU3 – Luttrell Pit
- OU4 – Watershed
- OU5 – Susie Mine
- OU6 – National Extension Mine
- OU7 – Peerless and Queensbury Mines
- OU8 – Upper Valley Forge Mine

The 2002 ROD issued for the Site is the OU4 ROD. This ROD states:

Watershed OU4 encompasses all of the other Site OUs and includes all historic inactive or abandoned mine sites located in the Upper Tenmile Creek Mining Area Site. In addition to the mine sites, OU4 also includes all other media known to be impacted by mine-related contamination, including AMD (acid mine drainage), groundwater, surface water, stream sediments, residential yards, and contaminated roadways. Since it addresses all mine sites and all media at the site, this (OU4) ROD is expected to be the only ROD for the site.

The ROD for the Upper Tenmile Creek Site was signed on June 28th, 2002. Remedial Action Objectives (RAOs) were developed as a result of data collected during the Remedial Investigation to aid in the development and screening of remedial alternatives to be considered for the ROD. EPA has established the following RAOs for the site:

<u>Mine Wastes, Soils, and Sediment</u>

- Achieve acceptable exposure risks for residents and visitors
- Achieve acceptable exposure risks for terrestrial and aquatic species

<u>Surface Water</u>

- Protect current and reasonably anticipated future source waters for the Helena water supply system
- Achieve acceptable exposure risks for residents and recreational visitors through attainment of surface water quality standards
- Achieve acceptable exposure risks to terrestrial and aquatic species through attainment of surface water quality standards

Groundwater

- Protect current and reasonably anticipated future users of groundwater
- Control groundwater contaminant plumes at mine adit discharges and waste source areas through the use of source control measures
- Prevent or minimize contaminant loading from the near-stream groundwater underlying mine waste source areas to surface water

To meet the RAOs for the site, EPA established remediation, or cleanup levels, that the selected remedy must meet. These levels are provided in the tables below.

Table 4 Soil Cleanup Levels and Initial Excavation Criteria

Contaminant	Cleanup Levels (mg/kg)	Excavation Criteria (mg/kg)
Residential		
Arsenic[1]	120	96
Lead	1,000	800
Recreational		
Arsenic[1]	1,440	1,150

1 – Cleanup levels are equivalent to an estimated excess cancer risk level of approximately 1.0X10-5 (2002 ROD Section 12.6)

Table 5 Cleanup Levels for Key COCs in Surface Water and Groundwater

Contaminant	Aluminum µg/L	Arsenic µg/L	Cadmium µg/L	Copper µg/L	Lead µg/L	Mercury µg/L	Zinc µg/L
Surface Water							
Human Health Standard	NA	10	5	1,300	15	0.05	2,100
Acute Aquatic Life Standard	750	340	0.52	3.8	14	1.7	37
Chronic Aquatic Life Standard	87	150	0.10	2.8	0.54	0.91	37
Groundwater							
Human Health Standard	NA	10	5	1,300	15	2	2,100

NA= Not Applicable

Remedy Components

The major components of the selected remedy addressing mine waste, soil and sediment include the following:

1. Excavate and dispose of contaminated materials from high priority mine sites.
2. Excavate and dispose of contaminated yard soils from residences and occasional-use recreational cabins. The 2002 ROD indicated that a community wastewater treatment system could be

implemented and due to the state of the individual septic systems encountered during residential yard remediation the community system was pursued.

3. Monitor water quality and sediment quality in Tenmile Creek after waste rock/ tailings and AMD cleanup actions are complete.
4. Excavate, transport, and dispose of contaminated roadway materials underlying Rimini Road.

The major components of the selected remedy addressing surface and groundwater include the following:

1. Cap and re-grade collapsed shafts/adit portals and construct drainage features to prevent or reduce storm water and snowmelt from entering mine workings and contributing to AMD.
    a. Design investigations to map mine site features and identify sites where source control and flow reduction techniques could be potentially successful.
    b. Conduct additional detailed studies and pilot tests of flow segregation, grouting, or other source control/ flow reduction techniques.
    c. Full scale flow reduction actions at sites where they are deemed appropriate.
    d. Evaluation, design, and construction of AMD treatment facilities, if necessary to meet state ambient water quality standards.
2. Implement institutional controls to prevent the use of new drinking water wells where contaminated aquifers exist.
3. Source control actions for waste rock and tailings and AMD, augmented stream flows during low-flow periods and natural attenuation of contaminants in surface water.
4. Build a new community water system for Rimini residents utilizing groundwater from deep wells (ROD 2002).

A ROD Amendment was signed in September of 2008: the community wastewater system was abandoned thus individual septic systems were installed and the source of the Rimini Community Water System was changed from groundwater, as no suitable deep well source could be located, to treated surface water from Tenmile Creek. The 2008 ROD amendment maintained all other RAOs.

Remedy Implementation

Remedial activities that have been conducted since the ROD was signed in 2002 include the following:

- 2003: EPA removed 10,000 cubic yards (cy) of mine waste and contaminated soils from residential properties and roads in the Landmark Subdivision and 22,000 cy of mine waste from the Lee Mountain mine site. Wastes were disposed of at the Luttrell Repository.
- 2004: EPA removed 12,000 cy of mine waste and contaminated soils from residential properties in the Landmark Subdivision. Wastes were disposed of at the Luttrell Repository. Final cover was placed over Cells 1 and 2 at the Luttrell Repository.
- 2006: EPA removed 30,000 cy of mine wastes and contaminated soils from residential properties in Rimini. Wastes were disposed of at the Luttrell Repository.
- 2005: EPA began installation of a community wastewater treatment facility for Rimini.
- 2006: EPA conducted a treatability study of a chemical/physical process for metals removal from the Susie Mine adit discharge.
- 2007: EPA removed soil from the Lee Mountain Mine.
- 2007: EPA applied at least four-inches of road-base to Rimini Road in Rimini.
- 2008: Record of Decision Amendment
- 2009: No remedial action funding available

- 2010: EPA conducted an investigation of adit discharge source control of Lee Mountain and Upper Valley Forge/Susie mine sites.
- 2010: EPA removed 24,000 cy of contaminated soils from Rimini Road.
- 2010-2011: Remediation of Rimini and Landmark properties with access agreements completed; 25,000 cy. Additional access agreement negotiations are on-going.
- 2011: Landmark Subdivision potable water evaluation completed.
- Jan 2011: RV Ranch Phase I shallow soil sampling.
- 2012 Lee Mountain/Little Lily Complex: field logbook calculations indicated that approximately 20,000 cy of waste material were excavated at Lee Mountain portion of the Complex and approximately 2,200 cy at the Little Lilly conducted
- 2013 Technical Evaluation of Capped Red Water Mine Waste begun and plan to complete the remediation of the remaining portion of the Little Lily side of the Lee Mountain/Little Lily Complex
- On-going: Facilitated discussions with the community of Rimini on water quality issues.
- On-going: Negotiations with MDNR and Lewis and Clark County to implement groundwater control areas.

Construction of the remedy is still ongoing. Response actions taken to date target the primary sources of risk to human health as well as many of the major contributors of metal loads to surface and groundwater. These source control actions have minimized the potential for acute releases of metals to the watershed. Though much progress has been made on several remedial action elements defined in the 2002 ROD and 2008 ROD Amendment, the remedy has not been fully constructed. The following actions need to be taken to ensure protectiveness: (1) installation of a permanent water supply for Rimini and ICs to prevent the use of contaminated groundwater (i.e. a controlled groundwater area); (2) remediation of the four remaining residential yards that have had access/legal limitations where contaminated soils are still present at levels resulting in health risk (waste left in place) or Institutional Controls developed to minimize exposure to waste left in place (EPA is awaiting participation from Lewis & Clark County); (3) a formalized compliance monitoring plan for the Luttrell Repository and rock/tailings sites (4) Source Adit Discharge Control by reduction and/or treatment of adit discharges and mine influenced groundwater so as to reduce impact to drinking water as well as Tenmile Creek and associated tributaries which are sources of drinking water for 85% of the City of Helena's Water Use; and (5) complete remedial action, removal & reclamation, of the ROD-defined high priority, "category C, D, & E", mine waste sites.

V. Progress Since the Last Five-Year Review

Protectiveness Statements from the First Five Year Review

"[T]he implementation process called for in the June 2002 ROD makes it impossible to determine at this time whether the remedy is protective. However, in as much as the goals of the ROD are currently met, EPA believes the remedy will ultimately be protective when construction is complete."

Status of recommendations and follow-up actions from last review

Status of recommendations and follow-up actions from the First Five-Year Review are discussed in **Table 6**.

Table 6 Actions Taken Since the Last Five-Year Review

Issues from Previous Review	Recommendations/ Follow-up Actions	Party Responsible	Milestone Date	Date of Action
There is potential that Landmark or Rimini residential water supply(s) may contain contaminants above MCLs at homes where landowners have declined offers of either bottled water or point of use water treatment systems.	Continue to work with landowners to allow provision of alternative water supply until such time that a permanent water supply solution can be constructed. Continue outreach and education of residents about their exposure risks.	EPA	July 2023	
Actions Taken and Outcome				
EPA has held ongoing discussions with the Rimini community with facilitation provided through a technical assistance grant (TAG). The TAG funded liaison has been working with the local sewer and water district to identify potable water sources and delivery infrastructure that best meets the community's needs. A ROD amendment was completed in 2008 committing to provide potable water from a surface water source. To date, the sewer and water district has refused EPA's offer of a potable water supply. The TAG group disbanded in December of 2012, but EPA continues outreach efforts. Landmark wells have been identified that exceed Maximum Contaminant Levels (MCLs). EPA is providing residents with bottled water. EPA is exploring more permanent options with State and County government agencies. EPA sent a letter to every landowner with drinking water contaminated above MCLs for arsenic, cadmium or lead and offered to provide bottled water until a permanent solution is implemented.				
The Remediation of 62 of the 67 residential properties (92.5%), identified as needing remedial action, has been completed. For many of these properties, sufficient work has been done to create a condition that is protective of human health. However, remaining partially remediated properties and non-remediated properties that are targeted for remedial action still are not protective of human health.	Continue to work with landowners to obtain access for the purpose of completing the five remaining properties identified for remedial action, as necessary to protect human health. However, access limitations may preclude remediation of all yards and implementation of engineering controls as well as Institutional Controls, with the help of Local Government, may be used to educate residents and the public to attempt to reduce exposure.	EPA	ICs 2018 Complete remedial action of five remaining properties as Access allows by 2023: Addendum per property	Construct Complete For Rimini & landmark Subdivi-sion June 20, 2013
Actions Taken and Outcome				
The previous goal for remediation of residential yards was met. However, an EPA HQ directive (Fall 2012) indicates the need to remediate one additional (unoccupied) rental property in the future should the property become occupied.				
Issues from Previous Review	**Recommendations/ Follow-up Actions**	**Party Responsible**	**Milestone Date**	**Date of Action**
Rimini Road remains un-remediated. However, as a temporary measure to suppress fugitive dust, at least four- inches of road-base was applied during 2007.	Perform Response Action.	EPA	Complete	6/29/11
Actions Taken and Outcome				
According to information in the remedial action report, the response action was completed and meets the RAOs established in the ROD.				

Issues from Previous Review	Recommendations/ Follow-up Actions	Party Responsible	Milestone Date	Date of Action
Issues from Previous Review	**Recommendations/ Follow-up Actions**	**Party Responsible**	**Milestone Date**	**Date of Action**
ICs on future groundwater wells have not been implemented.	Coordinate with Lewis & Clark County and MT DNRC to Implement institutional controls.	EPA	EPA October 2018	
Actions Taken and Outcome				
Ongoing: EPA has met with the Montana Department of Natural Resources to implement a controlled groundwater area. Lewis and Clark County Health Department has indicated a willingness to act as petitioner to designate the controlled groundwater area in the future as personnel and resources allow.				
Issues from Previous Review	**Recommendations/ Follow-up Actions**	**Party Responsible**	**Milestone Date**	**Date of Action**
ICs to prevent disturbance of capped mine wastes at the Red Water Mine have not been implemented.	Conduct Technical Evaluation to determine current stability and prepare action plan (based on priority) as necessary.	EPA	EPA July 2017	
Actions Taken and Outcome				
Ongoing: EPA is working with Lewis and Clark County and the local community regarding controls on 'waste left in place' for all residential properties. It appears that stakeholders prefer area-wide planning process with Geographic Information System (GIS) layers designating areas with waste left in place. The County appears willing to take on management responsibility.				
Issues from Previous Review	**Recommendations/ Follow-up Actions**	**Party Responsible**	**Milestone Date**	**Date of Action**
Many of the remedy components intended to address surface and groundwater quality have not been fully implemented.	Continue Response Actions. Per the ROD, these items are to be addressed after remediation of Mine Waste (Rock/Tailings) associated with the respective adit discharge.	EPA	July 2019 for Susie, Lee Mtn/Little Lily, Redwater, Bunkerhill, and National Extension Mine Adit Discharges : July 2023 for all others	
Actions Taken and Outcome				
Technical Evaluations and Remedy Designs are currently being developed with some elements are under construction.				
Issues from Previous Review	**Recommendations/ Follow-up Actions**	**Party Responsible**	**Milestone Date**	**Date of Action**

Issues from Previous Review	Recommendations/ Follow-up Actions	Party Responsible	Milestone Date	Date of Action
Performance standards and points of compliance have not been formalized under a Compliance Monitoring Plan (CMP) for the Luttrell groundwater monitoring network or treatment facility effluent discharge.	Develop and implement CMP (by 2016) for Luttrell Repository and upgrade efficiency of the system to treat discharge effluent	EPA	CMP by July 2017; Upgrade treatment system by October 2018	
Actions Taken and Outcome				
CDM has prepared a report for EPA making recommendations for discharge standards for leachate discharge from Luttrell. EPA is also working with the USGS to select existing long term "monitoring wells" to be designated "compliance wells." Both efforts will be consolidated into a CMP.				

VI. Five-Year Review Process

Administrative Components

This is the second Five-Year Review for the Site. The Five-Year Review was led by Tillman McAdams, EPA Remedial Project Manager. The following Team Members participated in the review:

- Richard Sloan DEQ Project Manager
- Mary Darling US Army Corps of Engineers, Omaha District
- David Shanight, CDM Smith.

This Five-Year Review consisted of the following activities: community involvement, data review, site inspection (**Attachment 4**), photo documentation (**Attachment 5**) local interviews (**Attachment 6**), a review of Site documents (**Attachment 7**) and the second Five-Year Review Report Development and Review.

The schedule for the review extended through July 2013. Due to problems experienced in getting documentation from the five-year review contractor (US Army Corps of Engineers) and a change in Remedial Project Manager during that timeframe, completion of the five-year review report was delayed through 2016.

Community Involvement

EPA continues to provide updates to the community via factsheets post the decision of the community to discontinue Technical Assistance Grant (TAG) participation in December of 2012. EPA, and its contractors, participates in Watershed meetings and communicates with Rimini residents, City, County and other stakeholders regularly. EPA discusses progress and plans associated with the five-year review at those meetings.

Upon completion of the Five-Year Review, a notice will be placed in the *Helena Independent Record* announcing that the Five-Year Review has been completed and that copies of the report are available for the public to review at EPA's Region 8 Montana Office Records Center and EPA's web page at http://www2.epa.gov/region8/upper-tenmile-creek-mining-area.

Document Review

This five-year review consisted of a review of relevant documents including ARARs, ROD, ROD Amendment, CCRs, EPA OSWER 9200.2-111, and monitoring data. A list of site documents used in the preparation of this five-year review is included as **Attachment 7**.

Data Review

The remedy includes monitoring water quality conditions. Surface water monitoring data is collected on a regular basis by the USGS at selected stream gauging stations (**Attachment 3**). The surface

water monitoring strategy was detailed in a Statement of Work (SOW) provided to the USGS by MDEQ, via agreement with EPA, and follows the USGS National Field Manual for the Collection of Water Quality Data. All samples are analyzed by a USGS laboratory. The appropriateness of the SOW is reviewed at an annual meeting between the USGS, DEQ and EPA with adjustments made, as appropriate. The data is provided on a public website at the following address: http://nwis.waterdata.usgs.gov/mt/nwis/qwdata and were used to create time vs. concentration graphs which are provided in **Appendices A1** and **A2** of this report.

Sitewide Surface Water Quality Data

Per the ROD, water quality and sediment quality in Tenmile Creek is to be monitored after waste rock/tailings and AMD remedial actions are complete. Because remedial actions are ongoing, analysis of trends was based on a limited data set for this review. Surface water trend data, provided in Appendix A, suggest that no discernible trend in surface water for contaminants of concern (arsenic, cadmium, lead, and zinc) concentrations are apparent at most stream gauging stations with exception to the Poison Creek Station. Trend data from the Poison Creek Station appear to show a decline in cadmium, copper, lead, and zinc concentrations since implementation of response actions associated with that drainage.

Site Inspection

The Site Inspection was performed on October 18, 2012. The following personnel attended the Site inspection:

- Tillman McAdams, US EPA
- Richard Sloan, Montana DEQ
- David Shanight, CDM Smith
- Karen Eckstrom, CDM Smith
- Mary Darling, USACE Omaha District Project Manager
- James Tiehen, USACE Project Chemist
- Jennifer Grimm, USACE Project Geologist
- Melissa Kemling, USACE Project Regulatory Specialist
- Gordon Lewis, USACE Project Geotechnical Engineer

The purpose of the Site Inspection was to assess the protectiveness of the remedy, observe current Site conditions and removal action elements (**Attachment 4**). However, given the large size of the Site (53 square miles), the remote location and difficult access of many mine sites, the Site inspection largely focused on remediation in the Landmark Subdivision and the community of Rimini. Information regarding the condition of other remedy elements away from Rimini such as water treatment at individual mine sites and the Luttrell Repository was provided by the EPA.

In the Landmark Subdivision, residential yards appeared vegetated and in good condition, indicating that post-soil removal restoration efforts were successful though one yard identified for remedial action remains un-remediated due to access issues (**Attachment 5** Photos 1 and 2). In the community of Rimini, those properties where remedial action was completed also appeared to be in good condition (Photos 3 and 4): four parcels identified for residential clean-up have not been addressed due to access/Legal issues. The unimplemented community wastewater treatment facility originally proposed to replace individual residential septic systems remains in good shape (Photo 5). Several of the replaced individual septic

systems were also observed (Photo 6). Evidence of community protest to EPA remedial work was observable in the form of yard signs (Photo 10).

Mine sites primarily contributing to AMD were observed by the USACE team during the site visit. The mines visited included the Red Water, Suzie and Lee Mountain mines (**Attachment 2**). Adit discharge water from the Suzie mine was actively flowing and discolored (Photo 7). According to CDM personnel, additional dye tracer studies were scheduled to commence for the Red Water mine (Photo 8) as part of the adit discharge source control investigation. At the Lee Mountain mine, reclamation progress was also observed (Photo 9).

Interviews

Interviews were conducted with Richard Sloan, Superfund Project Officer, DEQ; Bethany Ihle, On-Scene Coordinator, United States Forest Service; and Tillman McAdams, Remedial Project Manager, USEPA Region 8. Interview records are included in **Attachment 6**, and key topics are summarized below.

In general, the overall impression of the project is positive; however, it seems to be a common concern that the project has been ongoing for longer than expected. In the early years, the impression was project duration would be approximately 10 years, and subsequent designs reflected this assumption. Of particular note was the Luttrell repository which some mentioned is no longer cost effective when considering access challenges coupled with reduced waste volume. In addition, it was mentioned various times that communities are growing weary of EPA's presence and the accompanying inconveniences to everyday life. The uncertainties associated with funding the project seemed to be a common possible explanation for the extended removal phase.

Even though the communities are growing fatigued with the remediation process, they remain generally cooperative. Currently, the community interest is focused on Institutional Controls that have yet to be implemented and how this will affect use of their properties. It was noted several times that implementing institutional controls should be a focus in the near future. It was also noted that a community water system has not been developed for either the Landmark Subdivision or Rimini; because communities rely on individual systems it was emphasized that the County needs to enforce proper use of these systems if a community option is not developed. It was also suggested that the County address institutional controls to enable the EPA to pursue a permanent drinking water solution.

Interviewees were unified in recommending focus on completing the removal component of the project. A detailed plan was proposed to help focus the removal component effort, and suggestions were made to either close the Luttrell Repository or move waste disposal to a more accessible location.

VII. Technical Assessment

This section presents a technical assessment and is formulated based on the answers to Questions A, B, and C, presented below. Supporting information is provided in the previous sections. Documents reviewed for this assessment are included in **Attachment 7**.

Question A: Is the remedy functioning as intended by the decision documents?

At present, the remedy as defined in the decision documents is not complete. The status and performance of each remedy element is summarized below.

Table 7 Question A Evaluation

Remedy Element	Response Actions	Protectiveness Evaluation	Functioning as Intended?
Waste Rock and Tailings	Excavate and Dispose of contaminated materials from 70 high priority mine sites to Luttrell repository.	Remedial actions are ongoing but for the progress made to date, the actions taken meet ROD requirements of protectiveness.	Not completed: focus has been on mill sites and mine sites nearby Rimini &landmark
Acid Mine Drainage	Cap and re-grade collapsed adit/shafts and construct drainage features to prevent or reduce storm water and snowmelt from entering mine workings and contributing to AMD. Conduct a 4 phase program to develop and implement cost-effective control measures to eliminate metals loading from existing mine adit discharges.	An adit discharge source control investigation was completed in 2010 in support of the first phase of AMD remediation. Upon implementation, the Agency expects actions taken to meet ROD requirements of protectiveness.	No, Remedial Design in progress.
Groundwater	ICs in the form of controlled groundwater area	Controlled groundwater area IC not implemented.	No: awaiting Lewis & Clark County participation
Surface water	Removal of near-stream waste rock and tailings contaminant sources to eliminate leaching and erosion of contaminants into surface water, reduction of AMD loading of contaminants into surface water, and augmenting Tenmile Creek flows during low	Removal actions are on-going to address the waste rock and tailings. Reduction of AMD loading and creek augmentation activities have not begun at the time of this review. Rimini Water Supply System to be developed after addressing above actions which will dictate design.	No

	flow periods when water quality is significantly degraded. Rimini Drinking water system development after above activities.		
Stream Sediments	Long-term monitoring of sediment quality, followed by refinements in cleanup activities as necessary.	Contingency for removal of sediments remains as an option if other remedial activities do not produce adequate changes in contaminant loading.	N/A
Contaminated Yard Soils	Removal and disposal at residences and occasional-use recreational cabins to Luttrell repository. ICs such as deed notices and information to current and future property owners re: any inaccessible wastes with COCs above cleanup action levels will be implemented (ROD Amendment)	For 62 of the 67 properties, remedial action for residential soils have resulted in meeting ROD designated protectiveness. Legal/Access issues may result in the need for tracking un-remediated properties via Institutional Controls.	Not fully implemented: 92.5% of scheduled remediation is complete but need ICs for remaining properties or Access to conduct remediation.
Contaminated Roadway Materials-Rimini Road	Excavate, transport and dispose of contaminated materials to the Luttrell repository.	RA completed	Yes
Rimini Water Supply	Construct a reliable community water system drawing treated surface water from Tenmile Creek (ROD indicates mine waste rock/tailings and AMD will be addressed before surface water)	Community water system not implemented. EPA is providing bottled water to residents as an interim measure however, some residents are refusing the offer of bottled water.	No

The 2002 ROD anticipated a minimum ten-year remedy implementation period, and more than ten years have elapsed. Further, the ROD anticipated that a considerable period of time would elapse after full remedy implementation before it would be known whether the remedy will result in achievement of performance standards for surface and groundwater (as well as whether overall protectiveness has been achieved). Therefore, EPA has prioritized the implementation of remedy elements to first address risks to human health.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection still valid?

Yes, the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection are still valid.

Changes in Standards and To Be Considered (TBC)

Surface water and groundwater performance standards are based on "Contaminant-Specific" ARARs as per the ROD and ROD Amendment. The following tables outline the changes to ARARs that have occurred since the First Five Year Review.

Table 8 Changes to ARARs

Contaminant	Media	Cleanup Level	Standard		Citation/Year
Cadmium	Surface Water-Chronic Aquatic Life Standard	0.10 µg/L	Previous	0.10 µg/L	MDEQ Circular WQB-7, January 2002
			New	0.097 µg/L	DEQ-7 Circular, October 2012
Copper	Surface Water-Acute Aquatic Life Standard	3.8 µg/L	Previous	3.8 µg/L	MDEQ Circular WQB-7, January 2002
			New	3.79 µg/L	DEQ-7 Circular, October 2012
Copper	Surface Water-Chronic Aquatic Life Standard	2.8 µg/L	Previous	2.8 µg/L	MDEQ Circular WQB-7, January 2002
			New	2.85 µg/L	DEQ-7 Circular, October 2012
Lead	Surface Water-Acute Aquatic Life Standard	14	Previous	14 µg/L	MDEQ Circular WQB-7, January 2002
			New	13.98 µg/L	DEQ-7 Circular, October 2012
Lead	Surface Water-Chronic Aquatic Life Standard	0.54	Previous	0.54 µg/L	MDEQ Circular WQB-7, January 2002
			New	0.545 µg/L	DEQ-7 Circular, October 2012

The changes in the ARARs are limited to the number of significant digits reported and do not affect the overall protectiveness of the remedy. The changes were presented in the interest of thoroughness. There have been no changes in TBCs that affect the overall protectiveness of the remedy.

Changes in Exposure Pathways

There have been no known or expected land use changes on or near the site. There have been no newly identified or changes in human health or ecological routes of exposure. There are no newly identified contaminants or contaminant sources. There are no unanticipated toxic byproducts of the remedy. There have been no changes to physical site conditions that would affect protectiveness. There have been no changes in exposure pathways that affect the overall protectiveness of the remedy.

Changes in Toxicity, and Other Contaminant Characteristics

The ROD identified risk-based cleanup goals for soils and mine wastes present in residential yards. Arsenic is the primary COC with respect to carcinogenic and non-cancer health effects from solid media, surface water, sediment, and groundwater. The risk assessment indicated that incidental ingestion of solid media and ingestion of surface water and groundwater for drinking water consumption posed threats to current and potential future residents and workers. Arsenic and lead are the major COCs for sediment and surface soils, while arsenic, cadmium, and lead are the chemicals of concern in groundwater. The major COCs presenting a potential for adverse ecological effects relative to surface water are cadmium, copper, lead, and zinc.

The cleanup levels for arsenic in soil are equivalent to an estimated excess cancer risk level of approximately $1.0X\ 10^{-5}$ under the central tendency exposure (CTE) scenario. Under the reasonable maximum exposure (RME) the cleanup level for arsenic would equate to an estimated excess cancer risk of approximately $2X10^{-4}$. Background arsenic concentrations at the site are roughly equivalent to a risk level of $1X10^{-4}$, assuming a RME exposure (ROD, 2002).

There have been no changes in the soil toxicity factors that could affect the protectiveness of the remedy based on the comparison of the toxicity data provided in the ROD (2002) and the current toxicity values for arsenic and lead (EPA, 2012).

Changes in Risk Assessment Methods

During the review period (2008-2013), there were no changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy.

Expected Progress Towards Meeting Objectives of the Selected Remedial Actions

As part of the second five-year review, an evaluation of the RAOs stated in the ROD was conducted to determine whether the remedy is meeting or will meet RAOs. The RAOs for mine wastes, soils, and sediment remain valid. Acceptable exposure risks for residents and visitors have been achieved through remediation/reclamation of 62 of the 67 properties (92.5%) identified as requiring remedial action. However, five residential properties still require remedial action and are not protective of human health. EPA has continued its efforts to obtain access to remove contaminated soils, garner participation by all parties required to implement Institutional Controls. EPA awarded a Technical Assistance Grant (TAG) to Rimini Community, Inc. (RCI), a citizens group, to fund a liaison to facilitate discussions regarding 'waste left in place' and ROD required elements of the Site remedy from 2008 until December of 2012 when RCI representatives discontinued the TAG.

The RAOs for surface water and groundwater remain valid. From 2008 to December of 2012, EPA also discussed with RCI a potable water supply, controlled groundwater area,and continuing work to repair or replace disrupted waste water systems. Many of the remedy components intended to address surface and groundwater quality have not been fully implemented. EPA completed a ROD amendment in 2008 selecting a potable water supply derived from treated surface water for the community of Rimini;

however, this remedy has not been implemented and EPA is still providing bottled water to residents. ICs for future groundwater wells have not been implemented.

Question C: Has any other information come to light that could call into question the protectiveness of the response actions?

No.

Technical Assessment Summary

The remedy is still under construction. Remedy elements intended to mitigate risks to human health have been identified as a priority and have largely been completed. Remedy elements relevant to long-term protection of human health that have not yet been constructed/implemented include:

- A permanent water, surface water per the 2008 ROD Amendment, supply for Rimini
- Institutional control(s) to prevent the use of contaminated groundwater for drinking
- Remediation of remaining residential yards where remaining contaminated soils present a human health risk above a level of concern or Institutional Controls for properties with Legal issues such that remediation and reclamation are denied.
- CMP for the Luttrell repository
- A Technical Evaluation to determine what action is required for the capped mine wastes at the Red Water Mine
- Mitigation of AMD
- Excavation at remaining high priority mine sites

Adverse ecological impacts also remain throughout most of the Site. However, the ROD anticipated that such impacts might persist for some time even after completion of remedial action as remedies stabilize.

VIII. Issues

The following issues were raised during the second five-year review at Upper Tenmile Creek. These issues are presented in **Table 9**. Recommendations and follow-up actions are presented in **Section IX** of this report.

Table 9 Issues Raised During the Second Five-Year Review

Item No.	Issues	Affects Current Protectiveness (Y/N)?	Affects Future Protectiveness (Y/N)?
1	Landmark or Rimini residential water supply(s) may contain contaminants above MCLs at homes where landowners have declined offers of either bottled water or point of use water treatment systems.	Y	Y
2	Legal issues prevent remediation planned for 5 properties that are either partially remediated or properties at which no remediation has taken place.	Y	Y
3	Institutional controls on future groundwater wells have not been implemented.	N	Y
4	Institutional controls to prevent disturbance of capped mine wastes at the Red Water Mine have not been implemented.	N	Y
5	Remedy components intended to address surface and groundwater quality have not been fully implemented (Section IV).	Y	Y
6	Performance standards and points of compliance have not been formalized under a Compliance Monitoring Plan (CMP) for the Luttrell groundwater monitoring network or treatment facility effluent discharge.	Y	Y

IX. Recommendations and Follow-up Actions

Table 10 Recommendations and Follow-Up Actions

Item No.	Issues	Recommendations and Follow-up Actions	Party Responsible	Due Date
1	Landmark or Rimini residential water supply(s) may contain contaminants above MCLs at homes where landowners have declined offers of either bottled water or point of use water treatment systems.	Continue to offer bottled water until the 2008 ROD Amendment required surface water sourced drinking water supply can be constructed.	EPA	July 2023
2	Legal issues prevent remediation planned for 5 properties that are either partially remediated or properties at which no remediation has taken place.	Complete remedial action and/or implement ICs to meet protectiveness standard.	EPA	ICs by July 2018 Pursue Access to remediate 5 properties by July 2023
3	Institutional controls on future groundwater wells have not been implemented.	Implement an IC for controlled groundwater area.	EPA	July 2018
4	Institutional control to prevent disturbance of capped mine wastes at the Red Water Mine is not required by the ROD and has not been implemented.	Prepare a Technical Evaluation of the Red Water Mine capped waste and prioritize any future action required, if necessary.	EPA	July 2017
5	Remedy components intended to address surface and groundwater quality have not been fully implemented (Section IV p4-2)	Address Source Adit Discharge from Susie, Lee Mountain/Little Lily, Redwater, Bunkerhill, and National Extension mines.	EPA	July 2023
6	Performance standards and points of compliance have not been formalized under a Compliance Monitoring Plan (CMP) for the Luttrell groundwater monitoring network or treatment facility effluent discharge.	Develop a formalized singular plan, Compliance Monitoring Plan, that consolidates standards for leachate discharge and long term data from USGS and contractor monitoring wells.	EPA	July 2017

X. Protectiveness Statement(s)

Will be Protective

The remedy at OU4 is expected to be protective of human health and the environment upon completion. In the interim, remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risks in these areas.

XI. Next Review

The Site requires ongoing five-year reviews in accordance with CERCLA § 121 (c). While the next five-year review (covering the period of performance between July 2013 through July 2018) for the Site is required to be performed within five years of the signature date of this document, it is the intent of the Agency to provide information concerning the period of performance prior to the due date.

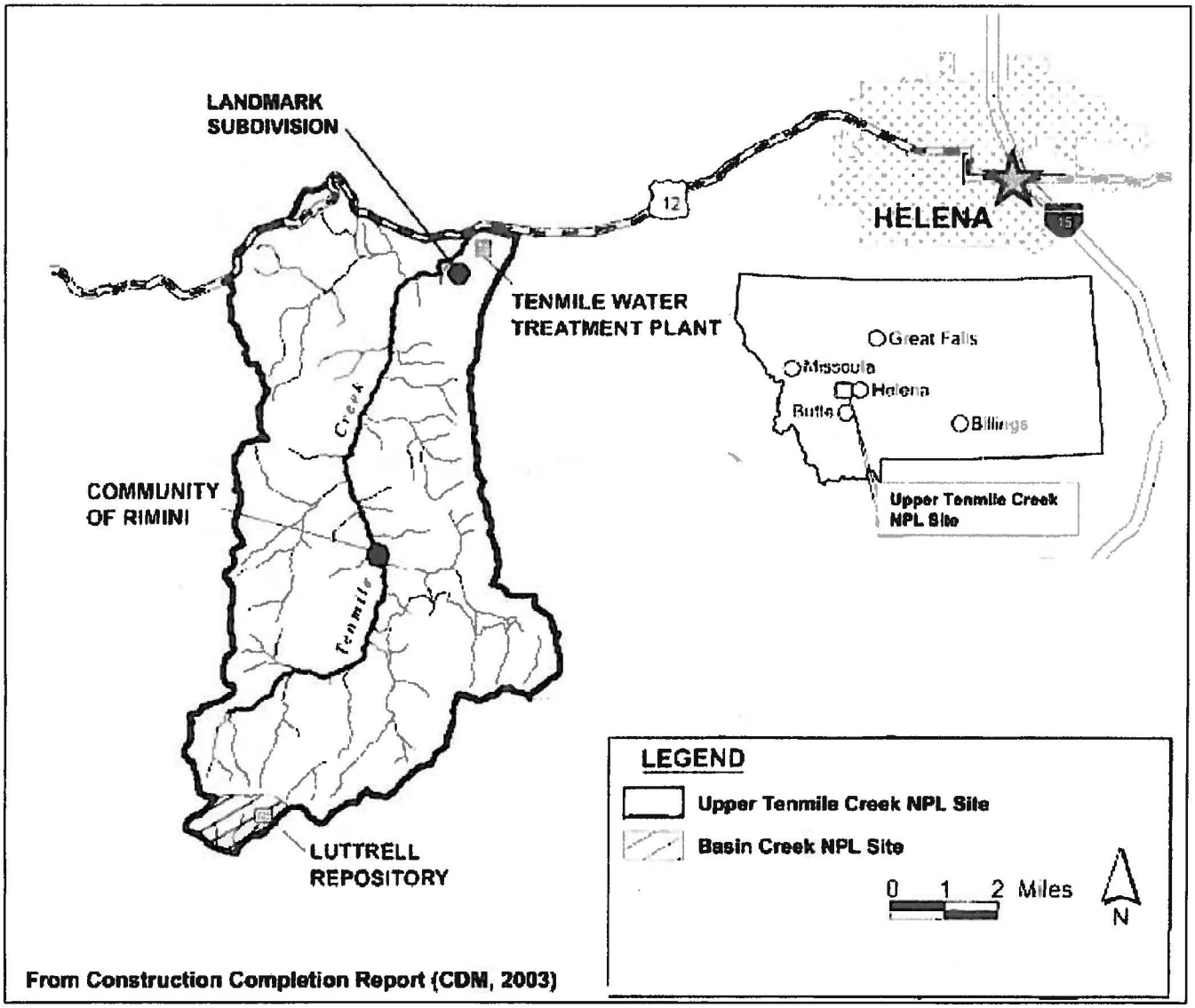
Second Five-Year Review Report
for the
Upper Tenmile Creek Mining Area NPL Site
Lewis and Clark County, Montana

Attachments

Attachment 1	Site Location Map
Attachment 2	Site Overview Map
Attachment 3	Surface Water Monitoring/Sampling Locations
Attachment 4	Site Inspection Checklist
Attachment 5	Photo Log
Attachment 6	Interview Records
Attachment 7	List of Documents Reviewed

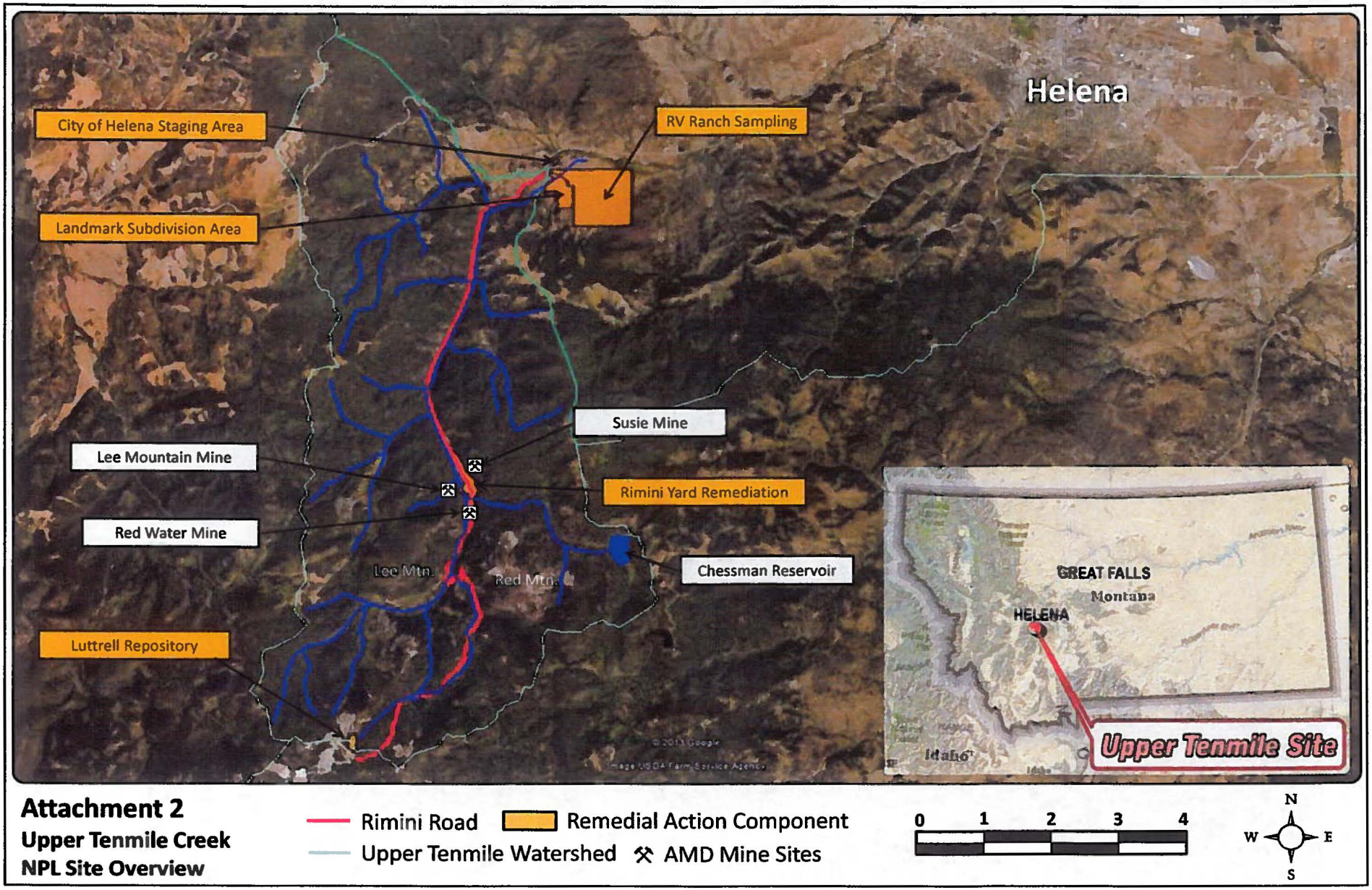
Appendices

Appendix A1	Surface Water Quality Since the Last Five Year Review
Appendix A2	Comprehensive Surface Water Quality Analysis

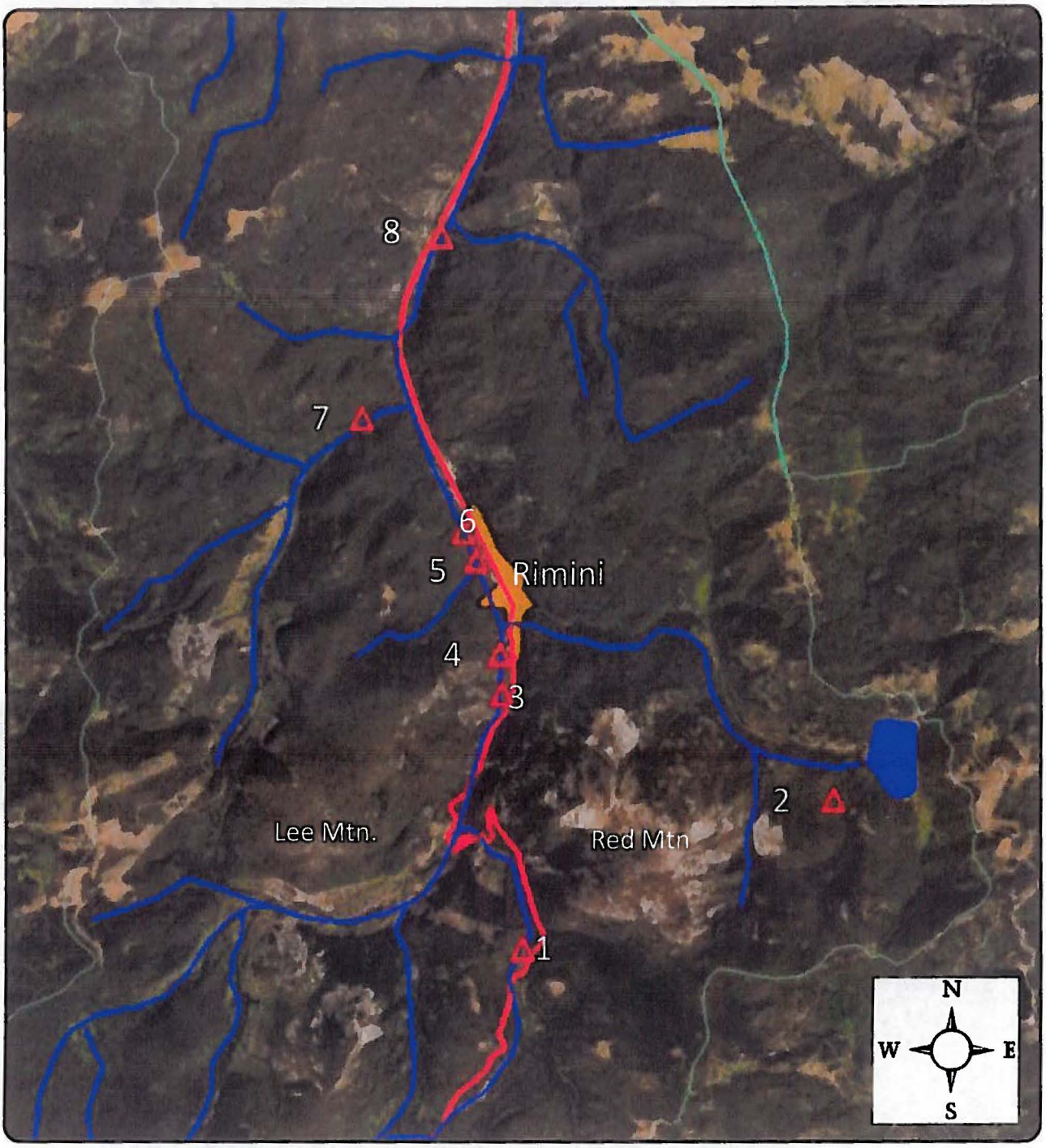


Attachment 1
Site Location Map

THIS SIDE BLANK



Attachment 2
Upper Tenmile Creek
NPL Site Overview



Attachment 3
Surface Water Monitoring Locations

Water-quality monitoring point

Station/USGS station number

1. Banner Cr. 0.5 mi ab City Diversion / 462657112143501
2. BeaverCr trib. no / 462758112123001
3. Poison Cr / 462538112143901
4. Tenmile ab City diversion / 462853112144101
5. Tenmile bl Spring Creek / 462922112145401
6. Moore's Spring Cr / 462932112142801
7. Minnehaha Cr above City diversion / 463023112153701
8. Tenmile nr Rimini / 06062500

Second Five-Year Review Report

Upper Tenmile Creek Mining Area

Superfund Site

Lewis and Clark County, Montana

ATTACHMENT 4

Site Inspection Checklist

Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: Upper Ten Mile Creek National Priority List Site	**Date of inspection:** 18 October, 2012
Location and Region: Lewis and Clark County MT, EPA Region VIII MT	**EPA ID:** MTSFN7578012
Agency, office, or company leading the five-year review: EPA Region VIII	**Weather/temperature:**

Remedy Includes: (Check all that apply)

Landfill cover/containment	√ Monitored natural attenuation- surface water
☐ Access controls	☐ Groundwater containment
√ Institutional controls	☐ Vertical barrier walls
Groundwater pump and treatment	
☐ Surface water collection and treatment	
√ ☐ Other: Waste Rock & Tailings, Excavation & Disposal	
√ ☐ Other: Acid Mine Drainage, Mitigation	

Attachments: None

II. INTERVIEWS (Check all that apply)

1. O&M site manager

INTERVIEW DATE: 3/25/2013
INTERVIEW METHOD: Email
NAME: Tillman McAdams
TITLE: Remedial Project Manager
ORGANIZATION: United States Environmental Protection Agency, Region 8, Montana Office
STREET ADDRESS: 10 West 15th Street, Suite 3200
CITY, STATE, ZIP: Helena, MT 59626
PHONE: (406) 457-5015
EMAIL: Mcadams.Tillman@epa.gov

2. O&M staff

No O&M Staff were interviewed.

3. Local regulatory authorities and response agencies (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

THIS SIDE BLANK

INTERVIEW DATE: 3/18/2013
INTERVIEW METHOD: Email
NAME: Bethany A. Ihle
TITLE: On-Scene Coordinator for USFS, Tenmile NPL Site
ORGANIZATION: Helena National Forest
STREET ADDRESS: 415 South Front St.
CITY, STATE, ZIP: Townsend, MT 59644
PHONE: (406) 439-0453
EMAIL: bihle@fs.fed.us

INTERVIEW DATE: 3/21/2013
INTERVIEW METHOD: Phone
NAME: Richard Sloan
TITLE: Superfund Project Officer
ORGANIZATION: Montana Department of Environmental Quality
STREET ADDRESS: 1100 North Last Chance Gulch
CITY, STATE, ZIP: Helena, MT 59620-0901
PHONE: (406) 841-5046
EMAIL: RSloan@mt.gov

4. Other interviews

No other interviews were conducted.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. O&M Documents

☐ O&M manual	☐	Readily available	☐ Up to date	√ N/A
☐ As-built drawings	☐	Readily available	☐ Up to date	√ N/A
☐ Maintenance logs	☐	Readily available	☐ Up to date	√ N/A

Remarks: All elements of the remedy are not yet in place. The site is not yet in the O&M Phase.

2. Site-Specific Health and Safety Plan √ Readily available √ Up to date N/A

☐ Contingency plan/emergency response plan √ Readily available √ Up to date N/A ☐

Remark: None

3. O&M and OSHA Training Records ☐ √ Readily available √ Up to date N/A

Remarks: Applicable to OSHA Training Records only.

4. Permits and Service Agreements

☐ Air discharge permit	☐	Readily available	☐ Up to date	√ N/A
☐ Effluent discharge	☐	Readily available	☐ Up to date	√ N/A
☐ Waste disposal, POTW	☐	Readily available	☐ Up to date	√ N/A
☐ Other permits_____	☐	Readily available	☐ Up to date	√ N/A

Remarks: Permits associated with the Luttrell Repository were not reviewed.

5. Gas Generation Records ☐ Readily available ☐ Up to date √ N/A

	Remarks: None	
6.	**Settlement Monument Records** ☐ Readily available ☐ Up to date √ N/A Remarks: None	
7.	**Groundwater Monitoring Records** Readily available Up to date☐ N/A Remarks: Groundwater is monitored in association with the Luttrell Repository only. To date (4/1/2013), monitoring records have not been provided.	
8.	**Leachate Extraction Records** ☐ Readily available ☐ Up to date √ N/A Remarks: None	
9.	**Discharge Compliance Records** ☐Air ☐ Readily available ☐ Up to date √ N/A ☐Water (effluent) ☐ Readily available ☐ Up to date √ N/A Remarks: Discharge compliance is monitoring in association with the Lutrell Repository only. To date (4/1/2013), monitoring records have not been provided.	
10.	**Daily Access/Security Logs** ☐ Readily available ☐ Up to date √ N/A Remarks: None	
	IV. O&M COSTS – N/A	
1.	**O&M Organization – N/A** ☐State in-house Contractor for State ☐PRP in-house ☐ Contractor for PRP ☐Federal Facility in-house ☐ Contractor for Federal Facility ☐Other: Remarks: All elements of the remedy are not yet in place. The site is not in the O&M Phase.	
2.	**O&M Cost Records – N/A** Readily available ☐Up to date Remarks: All elements of the remedy are not yet in place. The site is not in the O&M Phase.	
3.	**Unanticipated or Unusually High O&M Costs During Review Period – N/A** Remarks: All elements of the remedy are not yet in place. The site is not in the O&M Phase.	
	V. ACCESS AND INSTITUTIONAL CONTROLS	
A. Fencing – N/A		

1.	**Fencing** ☐	Location shown on site map ☐	Gates secure	√ N/A

Remarks: None

B. Other Access Restrictions – N/A

1.	**Signs and other security measures**	☐ Location shown on site map	√ N/A

Remarks: None

C. Institutional Controls (ICs) – See Remarks

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	Yes	☒No	☐N/A
Site conditions imply ICs not being fully enforced	Yes	☒No	☐N/A

Type of monitoring (*e.g.*, self-reporting, drive by)

.

Frequency _____

Responsible party/agency _____

Contact _____ _____ _____ _____

Name Title Date Phone no.

Reporting is up-to-date	☐Yes	No	☐N/A
Reports are verified by the lead agency	Yes	☐No	☐N/A
Specific requirements in deed or decision documents have been met	☐Yes	No	☐N/A
Violations have been reported	☐Yes	No	☐N/A

Other problems or suggestions:

Remarks: Institutional controls for groundwater are part of the remedy selected in the ROD; however, the controls are not yet in place. Per the ROD, the selected remedy provides for the implementation of institutional controls to prevent the installation and use of new drinking water wells where contaminated aquifers exist. EPA will coordinate with the Lewis and Clark County health department and DNCR in establishing an appropriate controlled groundwater area.

2.	**Adequacy**	☐ICs are adequate	ICs are inadequate	☐N/A

Remarks: Institutional controls for groundwater are not yet in place. Point-of-use systems are being offered in the interim.

D. General

1.	**Vandalism/trespassing**	☐Location shown on site map	√ No vandalism evident

Remarks: None

2.	**Land use changes on site** ☐

Remarks: No on-site land use changes were noted.

3. **Land use changes off site** ☐

Remarks: No off-site land use changes were noted.

VI. GENERAL SITE CONDITIONS

A. Roads

1. **Roads damaged** ☐ Location shown on site map ☐ √ Roads adequate

Remarks: None

B. Other Site Conditions

Remarks: None

VII. LANDFILL COVERS – N/A

A. Landfill Surface – N/A

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident
Areal extent_____ Depth_____
Remarks_____

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident
Lengths_____ Widths_____ Depths_____
Remarks_____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
Areal extent_____ Depth_____
Remarks_____

4. **Holes** ☐ Location shown on site map ☐ Holes not evident
Areal extent_____ Depth_____

5. **Vegetative Cover** Grass ☐ Cover properly established ☐ No signs of stress
☐ Trees/Shrubs (indicate size and locations on a diagram)

6. **Alternative Cover (armored rock, concrete, etc.)**
Remarks_____

7.	**Bulges** Areal extent_____ Remarks_____	☐ Location shown on site map Height_____	Bulges not evident
8.	**Wet Areas/Water Damage** ☐ Wet areas ☐ Ponding ☐ Seeps ☐ Soft subgrade Remarks_____	Wet areas/water damage not evident ☐ Location shown on site map ☐ Location shown on site map ☐ Location shown on site map ☐ Location shown on site map	 Areal extent_____ Areal extent_____ Areal extent_____ Areal extent_____
9.	**Slope Instability** ☐ Slides Areal extent_____ Remarks_____	☐ Location shown on site map	No evidence of slope instability
B. Benches – N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			
1.	**Flows Bypass Bench** Remarks_____	☐ Location shown on site map	☐ N/A or okay
2.	**Bench Breached** Remarks_____	☐ Location shown on site map	☐ N/A or okay
3.	**Bench Overtopped** Remarks_____	☐ Location shown on site map	☐ N/A or okay
C. Letdown Channels – N/A (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)			
1.	**Settlement** Areal extent_____ Remarks_____	☐ Location shown on site map Depth_____	☐ No evidence of settlement
2.	**Material Degradation** Material type_____ Remarks_____	☐ Location shown on site map Areal extent_____	☐ No evidence of degradation
3.	**Erosion** Areal extent_____ Remarks_____	☐ Location shown on site map Depth_____	☐ No evidence of erosion

4. **Undercutting** ☐Location shown on site map ☐No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ ☐No obstructions
☐Location shown on site map Areal extent_____ Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
☐No evidence of excessive growth
☐Vegetation in channels does not obstruct flow
☐Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations – N/A

1. **Gas Vents** ☐Active ☐Passive
☐Properly secured/locked ☐Functioning ☐Routinely sampled ☐Good condition
☐Evidence of leakage at penetration ☐Needs Maintenance
☐N/A
Remarks_____

2. **Gas Monitoring Probes**
☐Properly secured/locked ☐Functioning ☐Routinely sampled ☐Good condition
☐Evidence of leakage at penetration ☐Needs Maintenance ☐N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
☐Properly secured/locked ☐Functioning ☐Routinely sampled ☐Good condition
☐Evidence of leakage at penetration ☐Needs Maintenance ☐N/A
Remarks_____

4. **Leachate Extraction Wells**
☐Properly secured/locked ☐Functioning ☐Routinely sampled ☐Good condition
☐Evidence of leakage at penetration ☐Needs Maintenance ☐N/A
Remarks_____

5. **Settlement Monuments** ☐Located ☐Routinely surveyed ☐N/A
Remarks_____

E. Gas Collection and Treatment - N/A

1. **Gas Treatment Facilities**
☐Flaring ☐Thermal destruction ☐Collection for reuse
☐Good condition ☐Needs Maintenance
Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
☐Good condition ☐Needs Maintenance
Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
☐Good condition ☐Needs Maintenance ☐N/A
Remarks_____

F. Cover Drainage Layer – N/A

1. **Outlet Pipes Inspected** ☐Functioning ☐N/A
Remarks_____

2. **Outlet Rock Inspected** ☐Functioning ☐N/A
Remarks_____

G. Detention/Sedimentation Pond – N/A

1. **Siltation** Areal extent_____ Depth_____ ☐N/A
☐Siltation not evident
Remarks_____

2. **Erosion** Areal extent_____ Depth_____
Remarks_____

3. **Outlet Works** ☐Functioning ☐N/A
Remarks_____

4. **Dam** ☐Functioning ☐N/A
Remarks_____

H. Retaining Walls – N/A

1. **Deformations** ☐Location shown on site map ☐Deformation not evident
Horizontal displacement_____ Vertical displacement_____
Rotational displacement_____
Remarks_____

2. **Degradation** ☐Location shown on site map ☐Degradation not evident
Remarks_____

I. Perimeter Ditches/Off-Site Discharge – N/A

1. **Siltation** ☐Location shown on site map √Siltation not evident
Areal extent_____ Depth_____
Remarks_____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
√ Vegetation does not impede flow
Areal extent_____ Type_____
Remarks_____

3. **Erosion** ☐ Location shown on site map Erosion not evident
Areal extent_____ Depth_____
Remarks_____

4. **Discharge Structure** Functioning ☐ N/A
Remarks_____

VIII. VERTICAL BARRIER WALLS – N/A

1. **Settlement – N/A** ☐ Location shown on site map ☐ Settlement not evident
Areal extent_____ Depth_____
Remarks_____

2. **Performance Monitoring – N/A** Type of monitoring_____
Performance not monitored_____

Frequency_____ ☐ Evidence of breaching
Head differential_____
Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES

A. Groundwater Extraction Wells, Pumps, and Pipelines – N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
☐ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A
Remarks

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☐ Good condition ☐ Needs Maintenance
Remarks_____

3. **Spare Parts and Equipment**
☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks

B. Surface Water Collection Structures, Pumps, and Pipelines – N/A

1. **Collection Structures, Pumps, and Electrical** ☐ Good condition ☐ Needs Maintenance
Remarks_____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☐ Good condition ☐ Needs Maintenance
Remarks_____

3. **Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐Requires upgrade
☐ Needs to be provided
Remarks_____

C. Treatment System – N/A

1. **Treatment Train** (Check components that apply)
☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
☐ Air stripping ☐Carbon adsorbers
☐Filters _____
☐ Additive (*e.g.*, chelation agent, flocculent)_____
☐ Others_____
☐Good condition ☐Needs Maintenance
☐Sampling ports properly marked and functional
☐Sampling/maintenance log displayed and up to date
☐Equipment properly identified
☐Quantity of groundwater treated annually
☐ Quantity of surface water treated annually
Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
N/A ☐Good condition ☐Needs Maintenance
Remarks_____

3. **Tanks, Vaults, Storage Vessels**
N/A ☐Good condition ☐Proper secondary containment ☐Needs Maintenance
Remarks_____

4. **Discharge Structure and Appurtenances**
N/A ☐Good condition ☐Needs Maintenance
Remarks_____

5. **Treatment Building(s)**
N/A ☐Good condition (esp. roof and doorways) ☐Needs repair
☐Chemicals and equipment properly stored
Remarks_____

6. **Monitoring Wells** (pump and treatment remedy)
☐Properly secured/locked ☐Functioning ☐Routinely sampled ☐Good condition
☐All required wells located ☐Needs Maintenance N/A
Remarks_____

D. Monitoring Data

1. Monitoring Data

☐ Is routinely submitted on time ☐ Is of acceptable quality

Remarks: Monitoring data in association with the Luttrell Repository has not been submitted to date (4/1/2013) for review.

Surface water quality is routinely monitored and submitted in a timely manner; however, per the ROD, surface water quality data is not required to be monitored in Tenmile Creek until after waste rock/tailings and AMD cleanup actions are complete.

2. Monitoring data suggests:

Monitoring data from the Luttrell Repository has not been provided.

Water quality data is collected from various drainage basins to monitor natural attenuation of contaminants in surface water. Surface water quality trends are included in the Second Five-year Review; however the data was not evaluated because source removals, considered necessary for natural attenuation to occur, are not yet complete.

☐

E. Monitored Natural Attenuation

1. Monitoring Wells (natural attenuation remedy)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located Needs Maintenance ☑ N/A

Remarks: Surface water monitoring data is discussed above (Section D.2). Monitored natural attenuation of ground water is not a remedy component.

X. OTHER REMEDIES – N/A

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

During the Site Inspection, it was noted that that the remedy has not been fully implemented. Generally, contaminated yard soils, roadway materials, and waste rock and tailings removal is close to complete. The acid mine drainage remedy component is likely the next focus. In addition, institutional controls associated with ground water need to be put into place.

B.	Adequacy of O&M
	Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. All elements of the remedy are not yet in place. The site is not in the O&M Phase.
C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. Currently, some elements of the selected remedy are complete, but most are in progress. A protectiveness determination of the remedy will likely need to be deferred until all components are in place.
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. Considering the remedy is not fully implemented, optimization opportunities were not evaluated.

Second Five-Year Review Report
for
Upper Tenmile Creek NPL Site
Lewis and Clark County, Montana

Attachment 5
Site Photographs

Photo 1: Area of previous yard remediation in Landmark. Trees were excavated around by hand

Photo 2: Landmark yard unremediated due to access refusal. Extensive landscaping on the property is cited as a reason for the refusal.

Photo 3: Rimini residential yard previously remediated

Photo 4: Rimini residential yard previously remediated

Photo 5: Unimplementeded waste water treatment plant. Area of buried 5000ga fiberglass UST.

Photo 6: Raised septic tank next to Rimini school building.

Photo 7: Suzie mine horizontal drainage discharge pond

Photo 8: Red Water mine adit and discharge water

Photo 9: Lee Mountain mine reseeding and drainage control.

Photo 10: Protest sign in Rimini. "Rimini Independents – SAY NO TO EPA WATER & SEWER"

Second Five-Year Review Report

Upper Tenmile Creek Mining Area

Superfund Site

Lewis and Clark County, Montana

ATTACHMENT 6

Interview Records

Five-Year Review Interview Record – Tenmile Creek NPL site

INTERVIEW DATE: 3/18/2013
INTERVIEW METHOD: Email

NAME: Bethany A. Ihle
TITLE: On-Scene Coordinator for USFS, Tenmile NPL Site
ORGANIZATION: Helena National Forest
STREET ADDRESS: 415 South Front St.
CITY, STATE, ZIP: Townsend, MT 59644
PHONE: (406) 439-0453
EMAIL: bihle@fs.fed.us

1. What is your overall impression of the project?

The complexity and longevity of the project was not anticipated during the development of the RI or in the design and subsequent waste placement in the Luttrell repository. The public involvement efforts conducted in late 1990's and early 2000's gave the impression of a 10-year project life. This has not been the case. The extended project life has resulted in additional costs, and wearying of the local public. As a cooperator agency, we deferred some of our other land management projects in anticipation of timely completion of remedial activities. Now we have projects backed up and a cranky local public and local cooperators to work with.

While individual project activities have been successful and the Luttrell regional repository has been an economic and environmentally sound solution for hard rock mine waste remediation, we have slipped past our financial and public window of opportunity to wrap this site up and get it into O &M.

The Forest Service has funded a comprehensive watershed –based water quality study by the USGS for almost ten years. Generally we are seeing some improving trends in water quality but not as much as we anticipated.

2. What effects have site operations had on the surrounding community?

Surrounding community members who have had their property remediated are mostly okay with project activities. There are many other landowners in the Rimini area that are fatigued by superfund in their back yards. In the nearby Helena area, the Tenmile Superfund work has provided jobs for CDM and their subcontractors, as well as Montana- based construction companies. Montana has a 'reclamation economy' due to the efforts and resources of the federal and state agencies who do mine reclamation, as well as the collected resources of PRPs. This is not a bad thing for the economy. Local and state level leadership understands this tie to the economy.

EPA waste removal activities have also resulted in summer road closures for primary forest access routes in the drainage. This has disrupted public land users annually for almost 10 years.

3. Are you aware of any community concerns regarding the site?

Community (Rimini area) landowners want the work wrapped up and completed so they can get their summers back. EPA superfund work and Forest Service mine reclamation work has resulted in significant improvements to certain roads in the Tenmile drainage that will be expensive to maintain if they are not 'reclaimed' to a lower standard after mine waste hauling is done. Rimini still does not have a community water or waste water system and relies on individual systems. The county will need to enforce the issues of these systems down the road if a community-based solution is not developed.

4. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency response from local authorities?
The Forest Service has been contacted on numerous occasions for violations of their road closures by the public during EPA's mine waste hauling activities. The FS response has been mostly too little, too late which the locals know so road closure violations are fairly commonplace. There has been a couple of wildfires in the Tenmile watershed over the years that required emergency fire response.

5. Do you feel well informed about the site's activities and progress?

Yes

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

EPA needs to get the solid waste removal component of this site wrapped up and the Luttrell Repository closed and put into O&M. Basin Creek site wastes need to get moved also. It has been almost 15 years. Then we need to focus on the adit waters which require a much different, more contemplative approach to determine the right solutions.

7. Is there anyone you feel should be interviewed about the site?

Bob Kirkpatrick, USDA Forest Service Region One Director of Engineering and Regional Environmental Engineer. (406) 329-3307

Five-Year Review Interview Record – Tenmile Creek NPL site

INTERVIEW DATE: 3/25/2013
INTERVIEW METHOD: Email

NAME: Tillman McAdams
TITLE: Remedial Project Manager
ORGANIZATION: United States Environmental Protection Agency, Region 8, Montana Office
STREET ADDRESS: 10 West 15th Street, Suite 3200
CITY, STATE, ZIP: Helena, MT 59626
PHONE: (406) 457-5015
EMAIL: Mcadams.Tillman@epa.gov

1. What is your overall impression of the project?

The complexity of the Site tends to have individuals and groups questioning what phase of the project is next and why. There are always competing issues at a Site and with this Site the inclusion of multiple agencies with responsibility and interest, along with the MDEQ, requires more contingency plans for flexibility in the process so as to best utilize funding from any and all sources when those funds are available. From my review of the progress prior to my acceptance of the RPM position for this site, I note that the previous RPM attempted to incorporate the ideas and direction of as many parties of interest as possible and achieved much success in the area of Human Health Protection. The primary focus was fulfilling requirements to have directive documents in place to proceed with remedial design and action. The most obvious success is the actual remediation of residential soils (Human Health component) for all but those properties where the owner refused access and a rental property (currently vacant) that came to my attention at the completion of the 2012 field season. The previous RPM did encounter resistance to the incorporation of a community waste water system that was mandated in the Record of Decision: the residents of the Rimini community had originally indicated that the system would be incorporate per the ROD then individuals moved out and the dynamics of the community changed and a vote was taken and the system (currently located on USFS property just North of Rimini) was voted out. This change was one of the items of the 2008 ROD Amendment in which the original requirement of a community waste water system was replaced with individual septic systems; protectiveness of the remedy was maintained and achieved either way. Progress concerning Institutional Controls and a source of drinking water for the Landmark Subdivision and Rimini community have come to a halt as Lewis & Clark County has been unable to participate in development of plans for these issues.

2. What effects have site operations had on the surrounding community?

As with every community, there are those that are in full support and those that are in complete opposition to Site activities. I have not encountered those individuals with an absolute negative stance regarding the Site. Most of the property owners I have encountered are pleased with the soil remediation and their only complaint is the amount of time they have dealt with the Superfund Process. The community is ready for Superfund Operations to be completed so they can just enjoy living in the community without any disruption.

3. Are you aware of any community concerns regarding the site?

I have been informed, by the primary contractor, of individuals that are completely aware of the material identified by EPA as above action levels and the exceedence of drinking water standards yet want nothing to do with EPA and don't see the need for any remedial operations. Again, the primary questions are:

--what operations are to be conducted next?
-- why are those the next steps given all the elements of the Site?
-- how much longer?

4. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency response from local authorities?

Not to my knowledge.

5. Do you feel well informed about the site's activities and progress?

I became the RPM for the Site in May of 2012 and have been provided many hours of update concerning Site elements, past issues, progress, and external (as well as internal) limitations associated with the Site. I have addressed site direction issues and have implemented plans to address issues where EPA has full control and directed the contractor to pursue other issues delayed by other agencies to the maximum extent we can proceed until those agencies provide input. Primary focus as of 2012 is on remediation of waste sources/mine sites along Tenmile Creek in the Rimini Community and upstream thus reducing source impact to the extent practicable attempting to cut off source contribution downstream. Remedial Design will focus on source adit contribution and options to reduce the volume of contamination by technical methods (i.e. dewatering water source contributing to adits) then prepare designs for the best technical option to address adit source control for the next phase of the Site remediation.

When Lewis & Clark County can address Institutional Controls, EPA will resume pursuit of a permanent drinking water solution for the Landmark Subdivision and Rimini Community (in the meantime, perhaps reduction of Source contribution will provide more options for drinking water in the future).

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

I will take consideration of any comments or better approaches. I have no control over previous site activities and must focus on what items I can pursue to problem solve and make a plan for the future. I will focus on actual physical site remediation as it seems logical that if one is to have more options available for remediation, reduction in source contribution is the most probable way to potential gain more options.

7. Is there anyone you feel should be interviewed about the site?

Beth Ihle of the USFS: (406) 439-0453.

Five-Year Review Interview Record – Tenmile Creek NPL site

INTERVIEW DATE: 3/21/2013
INTERVIEW METHOD: Phone

NAME: Richard Sloan
TITLE: Superfund Project Officer
ORGANIZATION: Montana Department of Environmental Quality
STREET ADDRESS: 1100 North Last Chance Gulch
CITY, STATE, ZIP: Helena, MT 59620-0901
PHONE: (406) 841-5046
EMAIL: RSloan@mt.gov

1. What is your overall impression of the project?

The project has been going on for close to 12 years. In the early years, the Remedial Action was effective. In retrospect, the current location and use of the Luttrell repository has not been very cost effective or efficient. The repository is effective for disposal of many wastes from multiple sites. But it has a negative impact with respect to the Tenmile site because of high altitude and difficult access limiting use to approximately 3 months a year. A repository near the city of Helena or along another more accessible area would have helped speed things along by being available for a longer period each year.

At the current stage, the major parts of the remediation have been done; probably 20% left. The project needs a specific, detailed plan to complete the last bits. The project seems to be drifting a bit in terms of focus. When 80% of a project is done, the last 20% can become a challenge to complete.

2. What effects have site operations had on the surrounding community?

Much of the Remedial Action directly impacted the community with the use of heavy equipment, trucks, noise, dust, etc. The EPA and the State made reasonable efforts to minimize impacts and communicate plans. Personnel were available on a daily basis to respond to issues and community concerns. Even though there were effects from site operations, there were no long-term negative impacts.

3. Are you aware of any community concerns regarding the site?

The biggest issue at this site is community diversity in terms or socio-economic status and environmental concerns. The mining community of Rimini is much different from the Landmark Subdivision. The Landmark Subdivision is more modern while Rimini is a historic mining town. The result is, significant difference in terms of concern. Many Rimini residents don't like government influence. For instance, Rimini residents were against the long-term cost of a water supply and are concerned with the 10 plus timeframe to get things done. Both communities are concerned with upcoming land-use controls, what those might be, and how they may impact use of their property.

4. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency response from local authorities?

There has been some damage to the road access gates in the Basin Mine area (hunters, ATV riders, snowmobilers), but not really significant vandalism. Some Rimini residents have been vocal in opposition to site activities, but there haven't been direct threats or incidents. There was verbal opposition to the proposed sewage treatment system, but the opposition was more about cost.

5. Do you feel well informed about the site's activities and progress?

Up until the middle of last year, activities, plans, and progress were well communicated. Since that time, the project has lost some focus as to what will be required to de-list the site. Some explanation is from budget uncertainties. What funding will be provided to the EPA or State is uncertain, and may explain some loss of focus. A detailed plan needs to be developed to complete the project.

6. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Just to repeat, objectively evaluating lower cost repository options is a big issue. The Luttrell repository made sense when dealing with a million cubic yards coming from three counties. The current volume of three cubic yards coming from maybe three sites is not cost effective.

We should thoroughly evaluate the environmental/public health benefit versus the cost of all removal actions, and consider in place-stabilization as an option to protect public health and the environment.

The institutional controls are of major interest to the public, so that needs to be expedited for both Rimini and the Landmark Subdivision.

Rerouting the creek around the National Extension tailings and stabilizing the tailings in place should be a focus. A focus should also be placed on defining and controlling the water sources for the major acid mine drainages, such as Susie, Lee Mountain, and Red water).

7. Is there anyone you feel should be interviewed about the site?

Mike Bishop, (406) 431-1829
Pat Keim, (406) 442-0249 – Property owner in Landmark,
Beth Ihle, (406) 439-0453 (USFS),
Tom Cleasby (406) 457-5919 (USGS)

Second Five-Year Review Report

Upper Tenmile Creek Mining Area

Superfund Site

Lewis and Clark County, Montana

ATTACHMENT 7

List of Documents Reviewed

Construction Completion Report, Landmark Subdivision Residential Yards Remediation (CDM, 2007).

2006 Construction Completion Report, Community of Rimini Residential Yards Remediation (CDM, 2007).

2003 Construction Completion Report, Landmark Subdivision Residential Yards Remediation, Upper Tenmile Creek Mining Area Site (CDM, 2004).

Record of Decision, June 28, 2002.

ROD Amendment, Sept 2008

Streamflow, Water Quality, and Quantification of Metal Loading in the Upper Tenmile Creek Watershed, Lewis and Clark County, West-Central Montana, September 1998.

Final Human Health Risk Assessment Report for Upper Tenmile Creek Mining Area Superfund Site (CDM, 2001).

Ecological Risk Assessment Report for Upper Tenmile Creek Mining Area Superfund Site (CDM, 2001).

Public Health Assessment, Upper Tenmile Creek Mining Area, Rimini/Helena, Lewis and Clark County, Montana (ATSDR, 2001).

Surface Water Quality Data, 1997-2006, provided by USGS, July 2007

2010 Construction Completion Report Rimini Road Remediation Upper Tenmile Creek Mining Area Site Lewis and Clark County, Montana (June 2011)

Lee Mountain Luttrell Specs 2007 / Lee Mountain Luttrell Drawings 2007

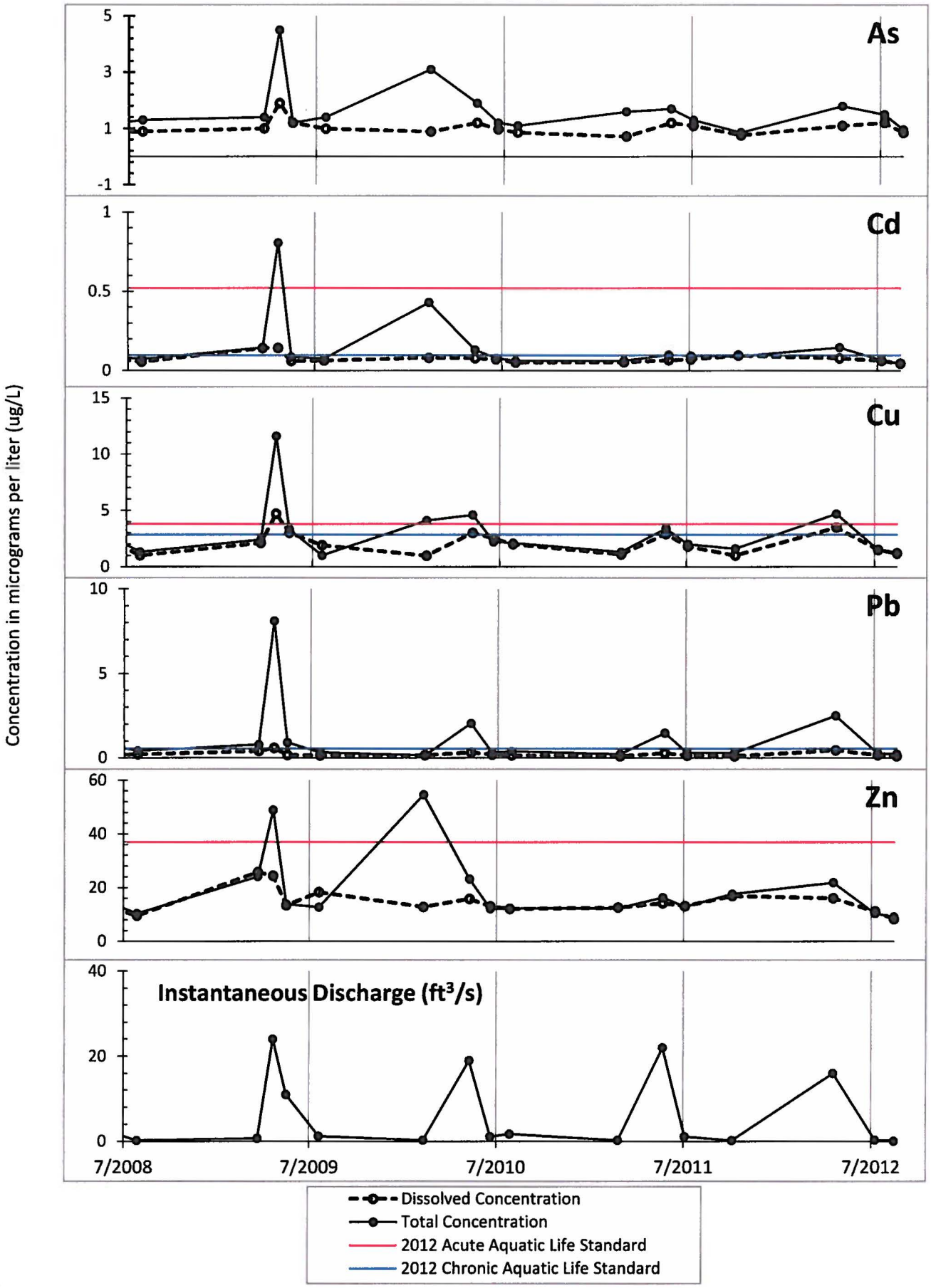
Landmark Yards Spec 2010 / Landmark Yards Drawings 2010

THIS SIDE BLANK

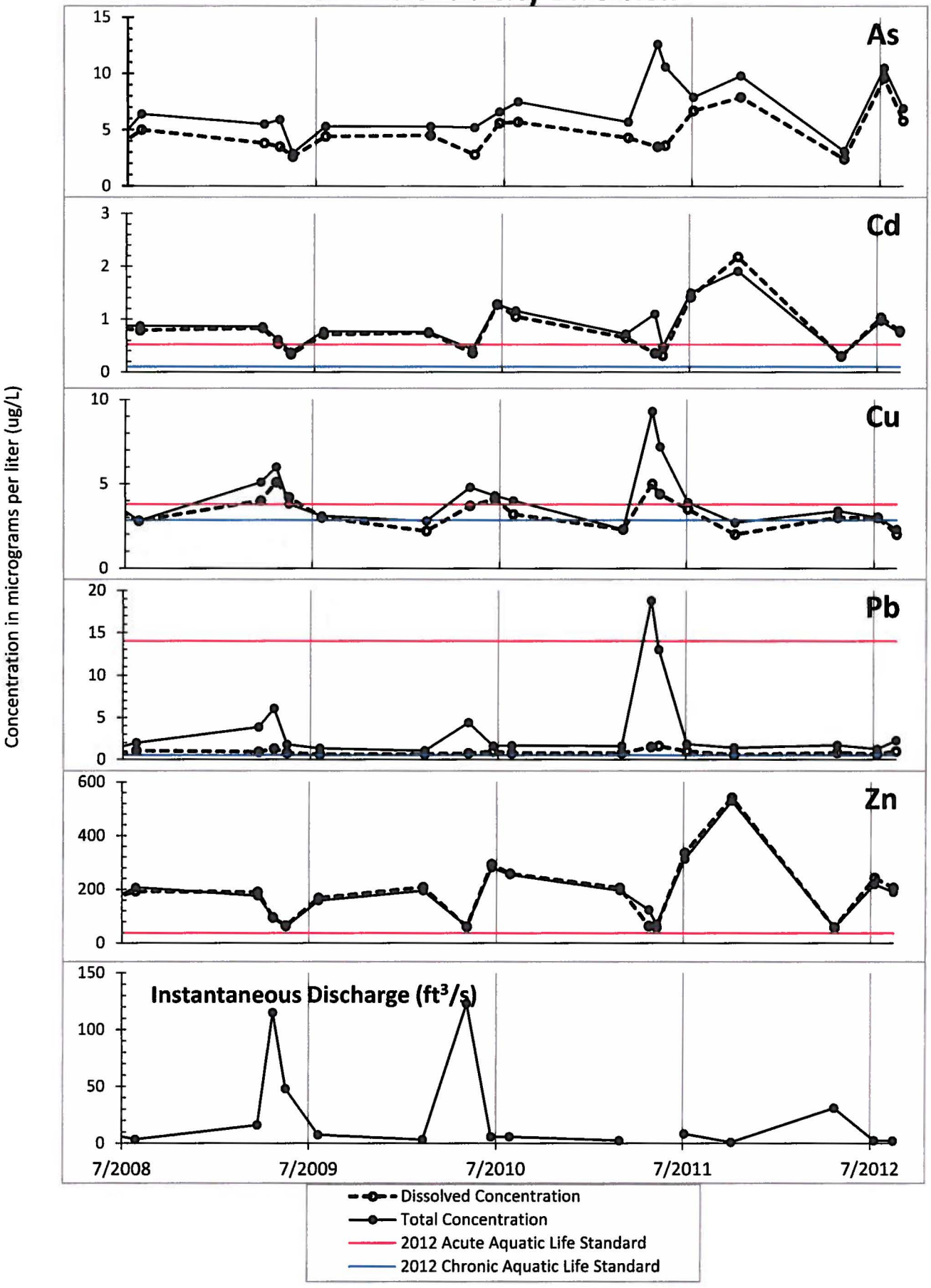
Second Five-Year Review Report
for
Upper Tenmile Creek National Priority List Site
Lewis and Clark County, Montana

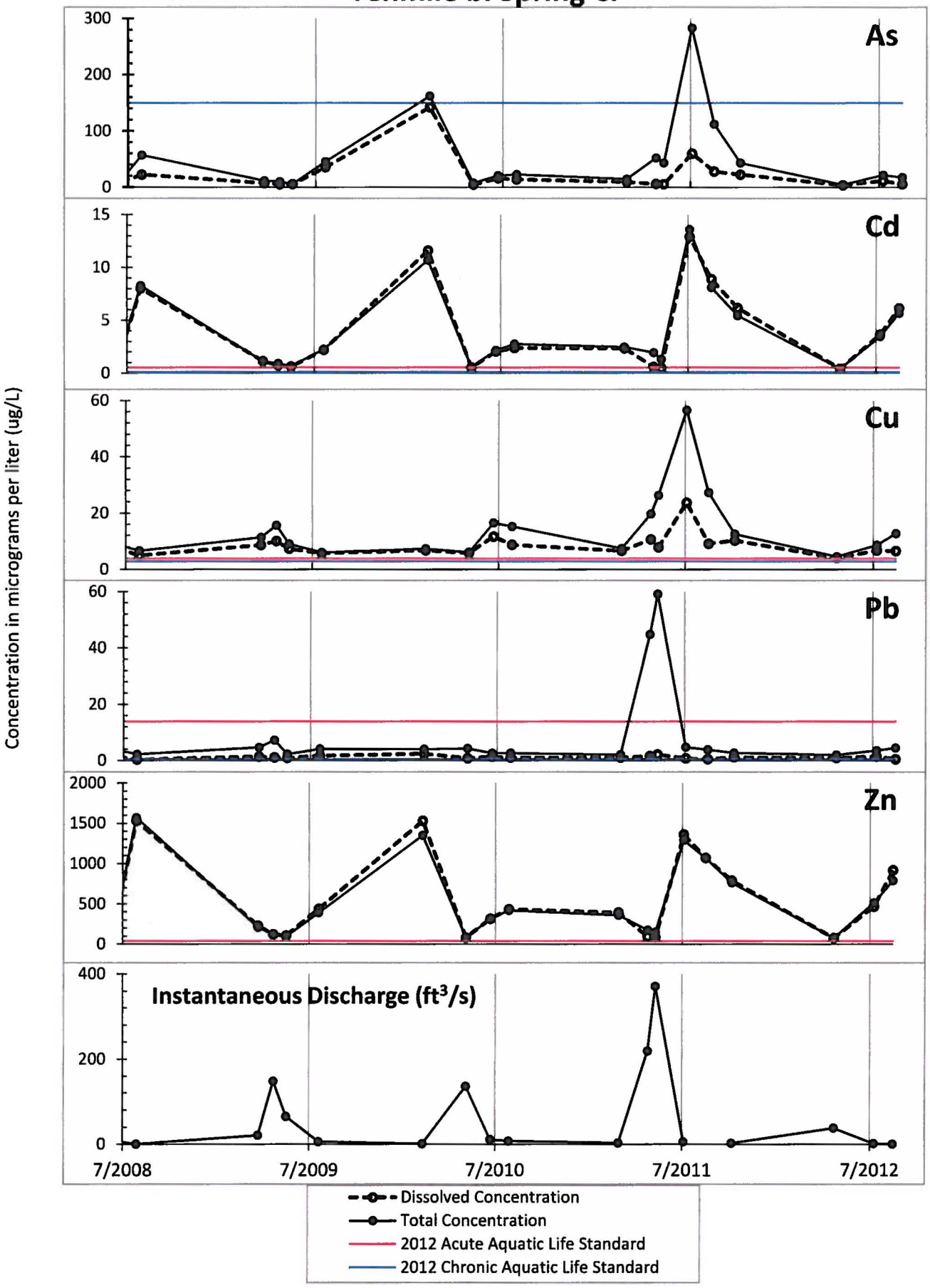
Appendix A1
Surface Water Quality Trends Since the Last Five Year Review

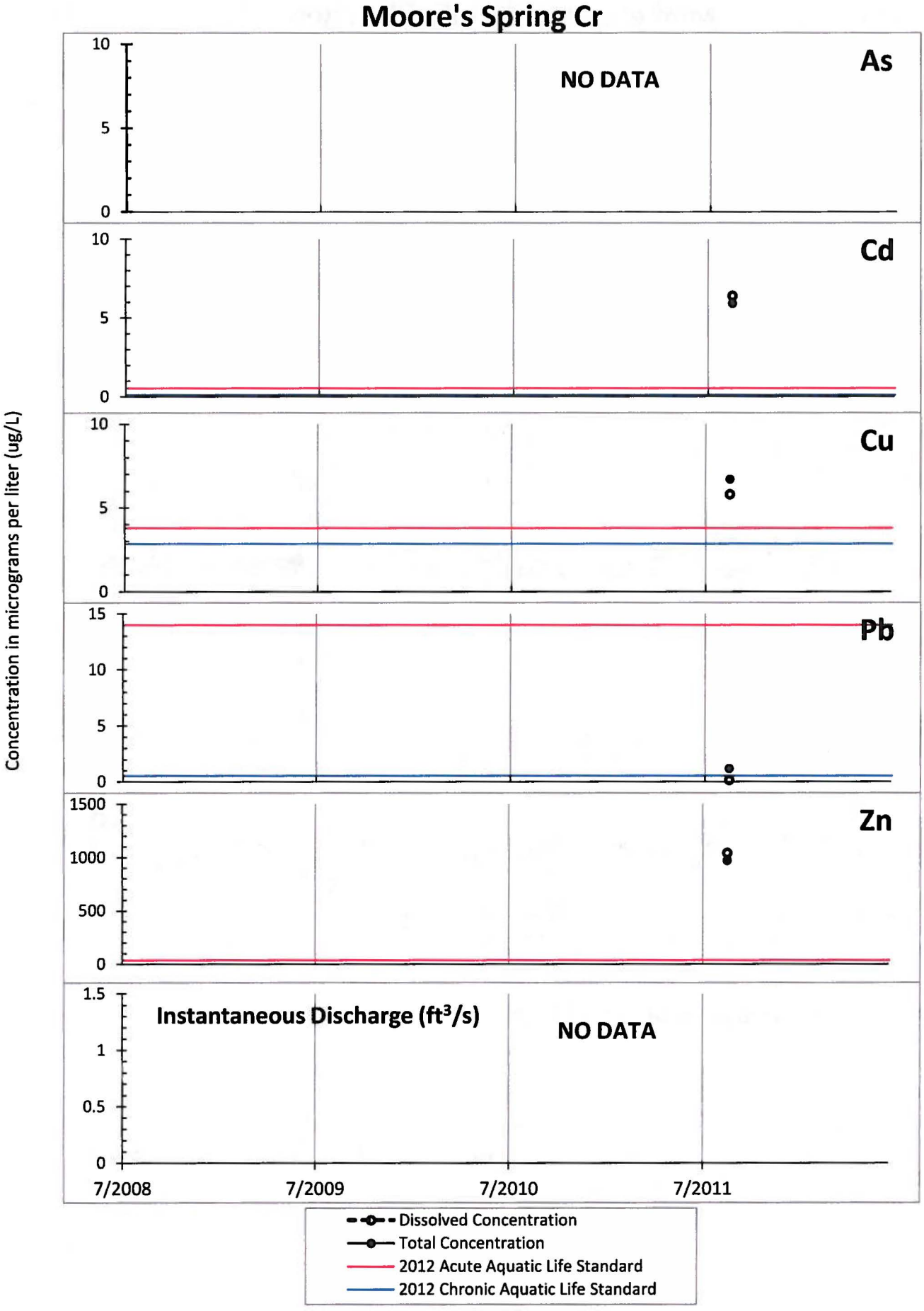
Banner Creek



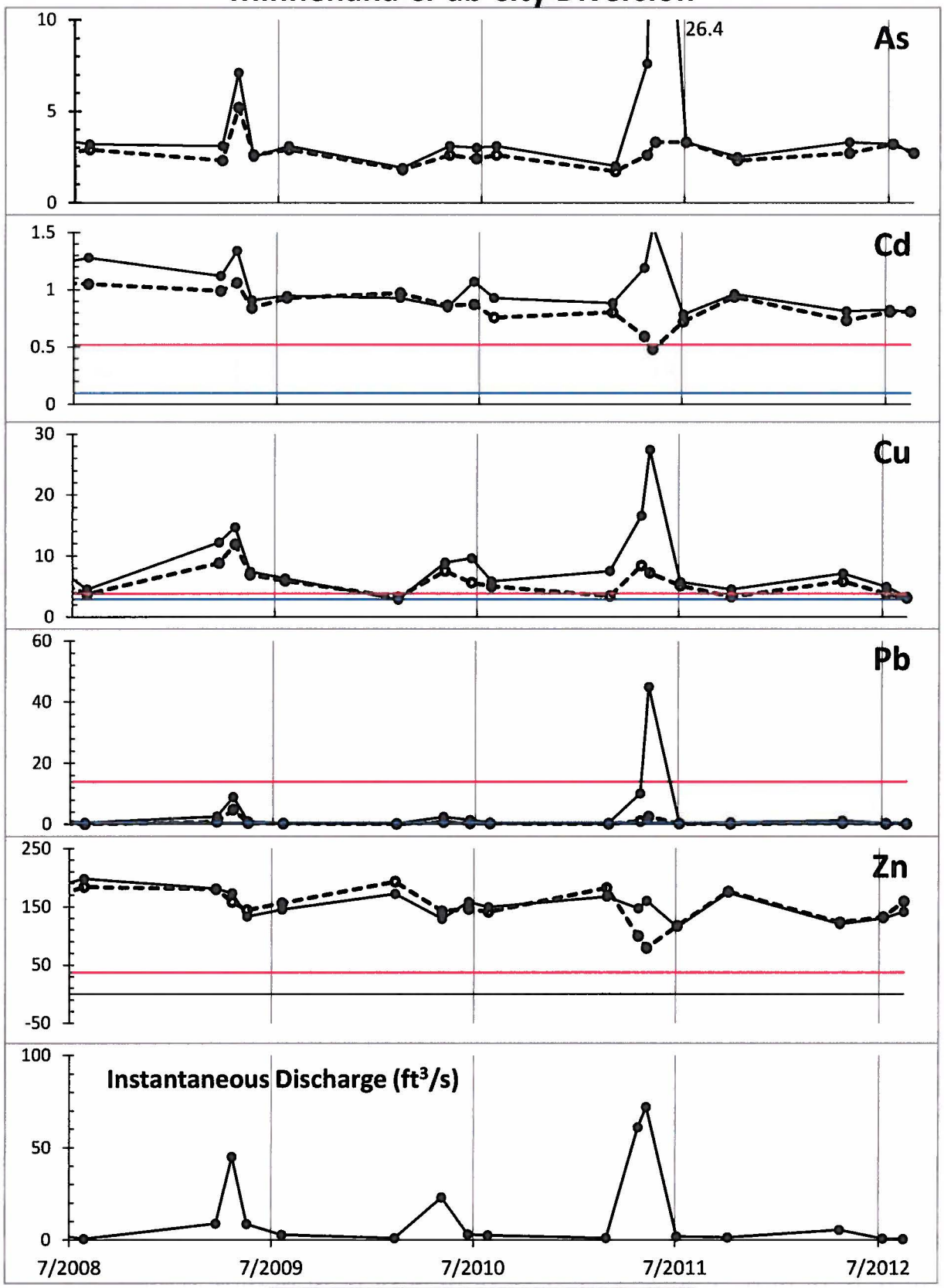
Tenmile Cr ab City Diversion



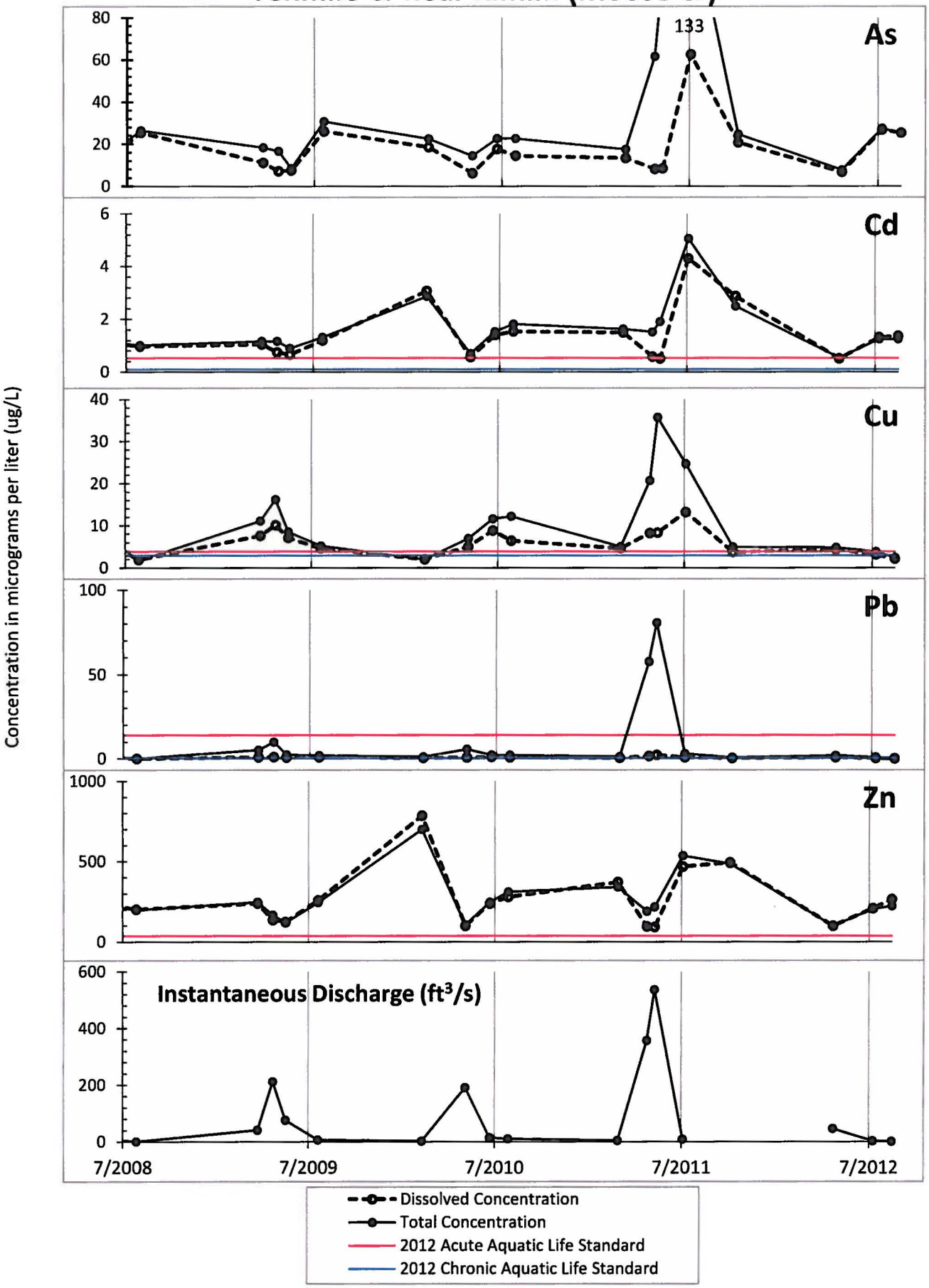

Tenmile bl Spring Cr
As
Cd
Cu
Pb
Zn
Instantaneous Discharge (ft³/s)
Concentration in micrograms per liter (ug/L)
7/2008
7/2009
7/2010
7/2011
7/2012
Dissolved Concentration
Total Concentration
2012 Acute Aquatic Life Standard
2012 Chronic Aquatic Life Standard


Moore's Spring Cr
As
NO DATA
Cd
Cu
Pb
Zn
Instantaneous Discharge (ft³/s)
NO DATA
Concentration in micrograms per liter (ug/L)
10
5
0
15
1500
1000
500
1.5
1
0.5
7/2008
7/2009
7/2010
7/2011
Dissolved Concentration
Total Concentration
2012 Acute Aquatic Life Standard
2012 Chronic Aquatic Life Standard

Minnehaha Cr ab City Diversion



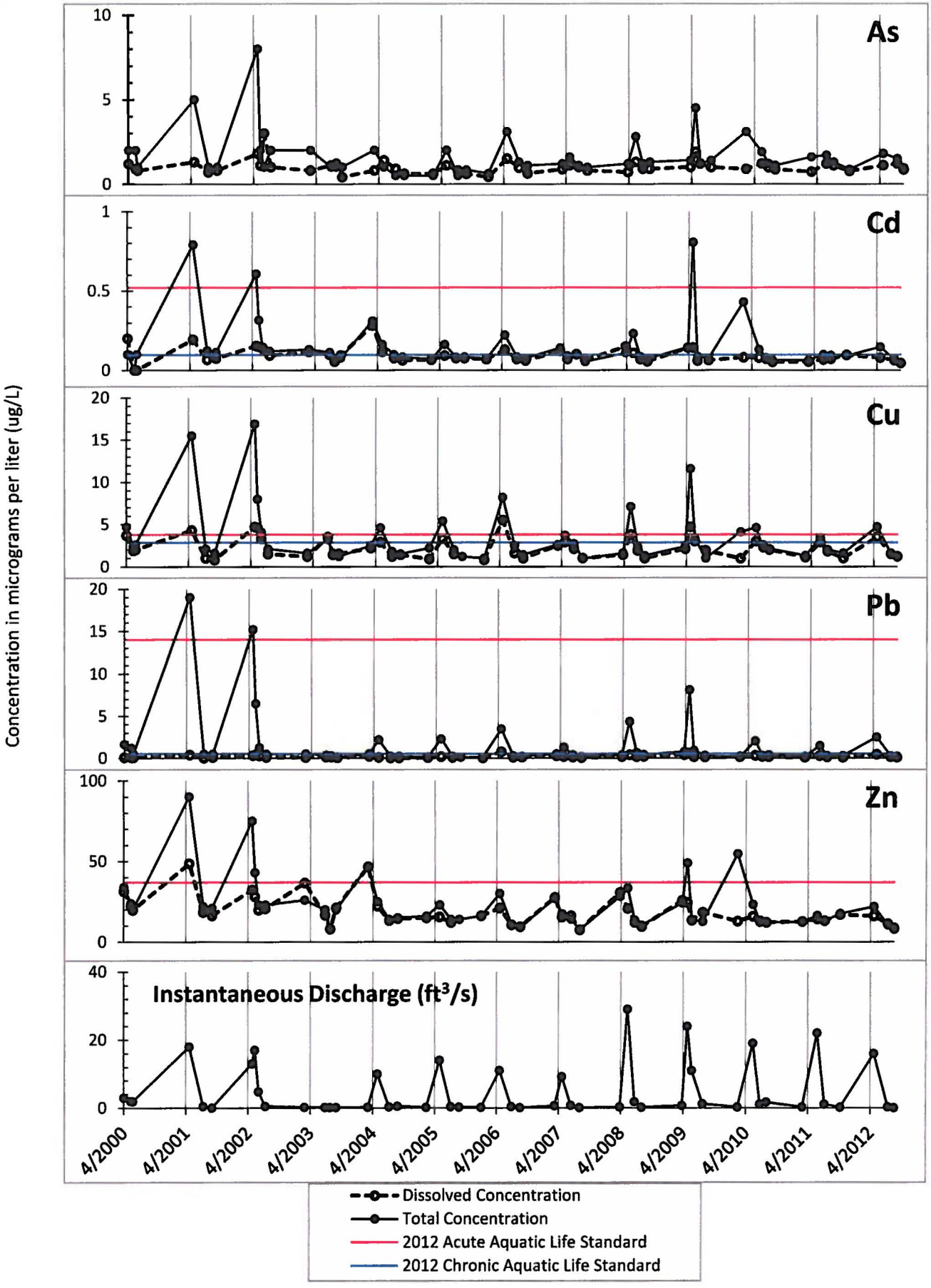
Tenmile Cr near Rimini (Moose Cr)



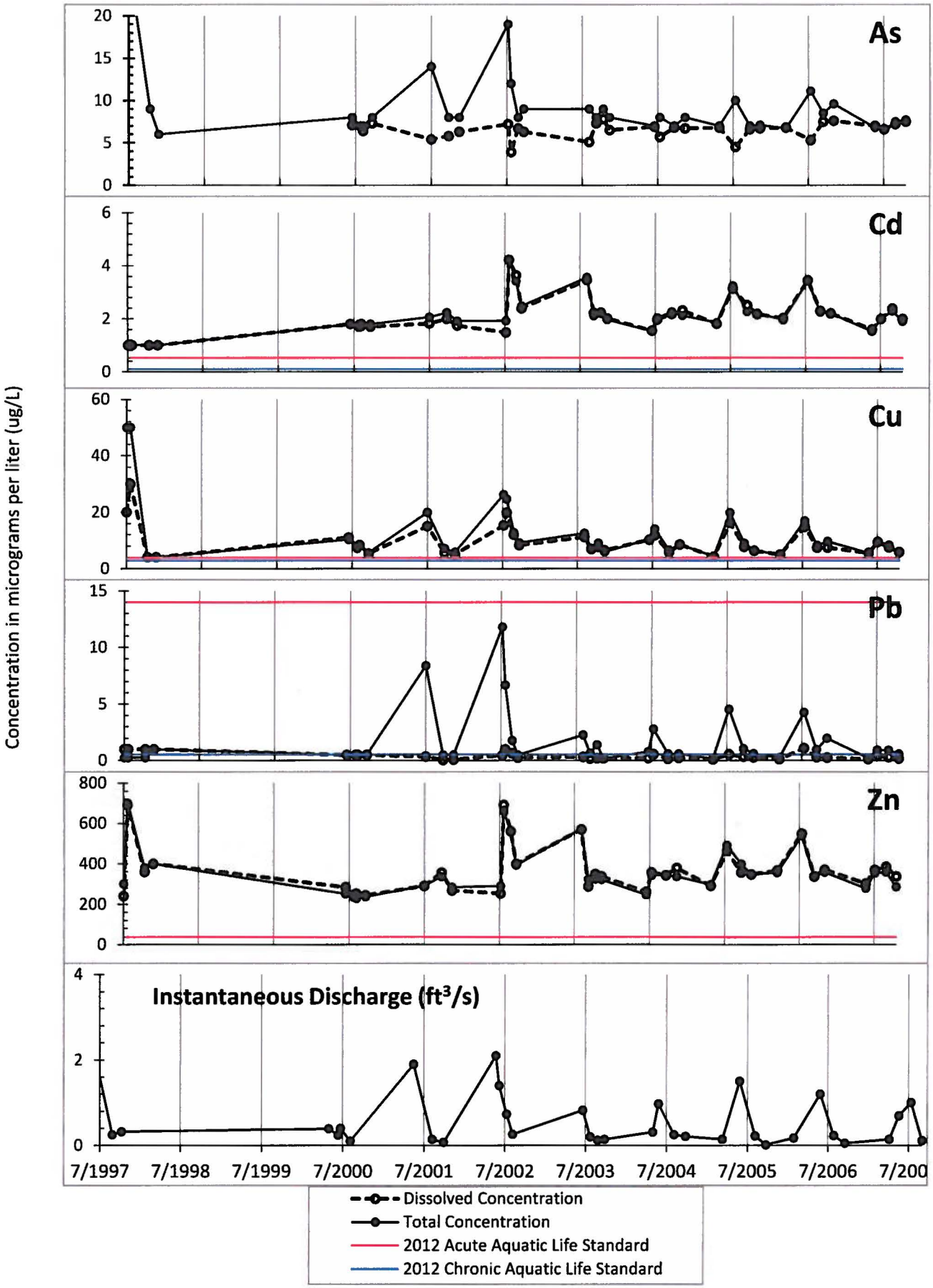
Second Five-Year Review Report
for
Upper Tenmile Creek National Priority List Site
Lewis and Clark County, Montana

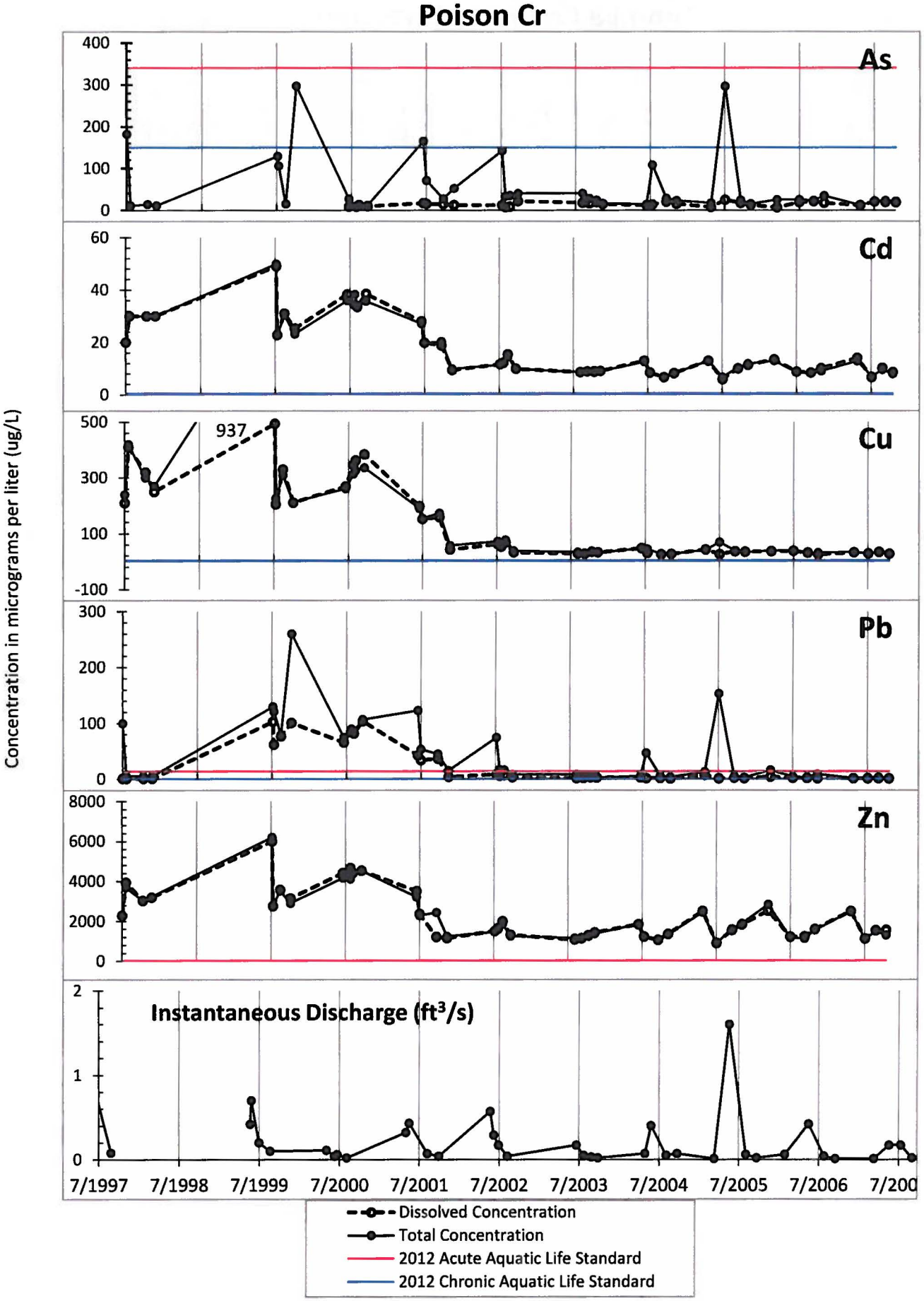
Appendix A2
Comprehensive Surface Water Quality Trends

Banner Creek

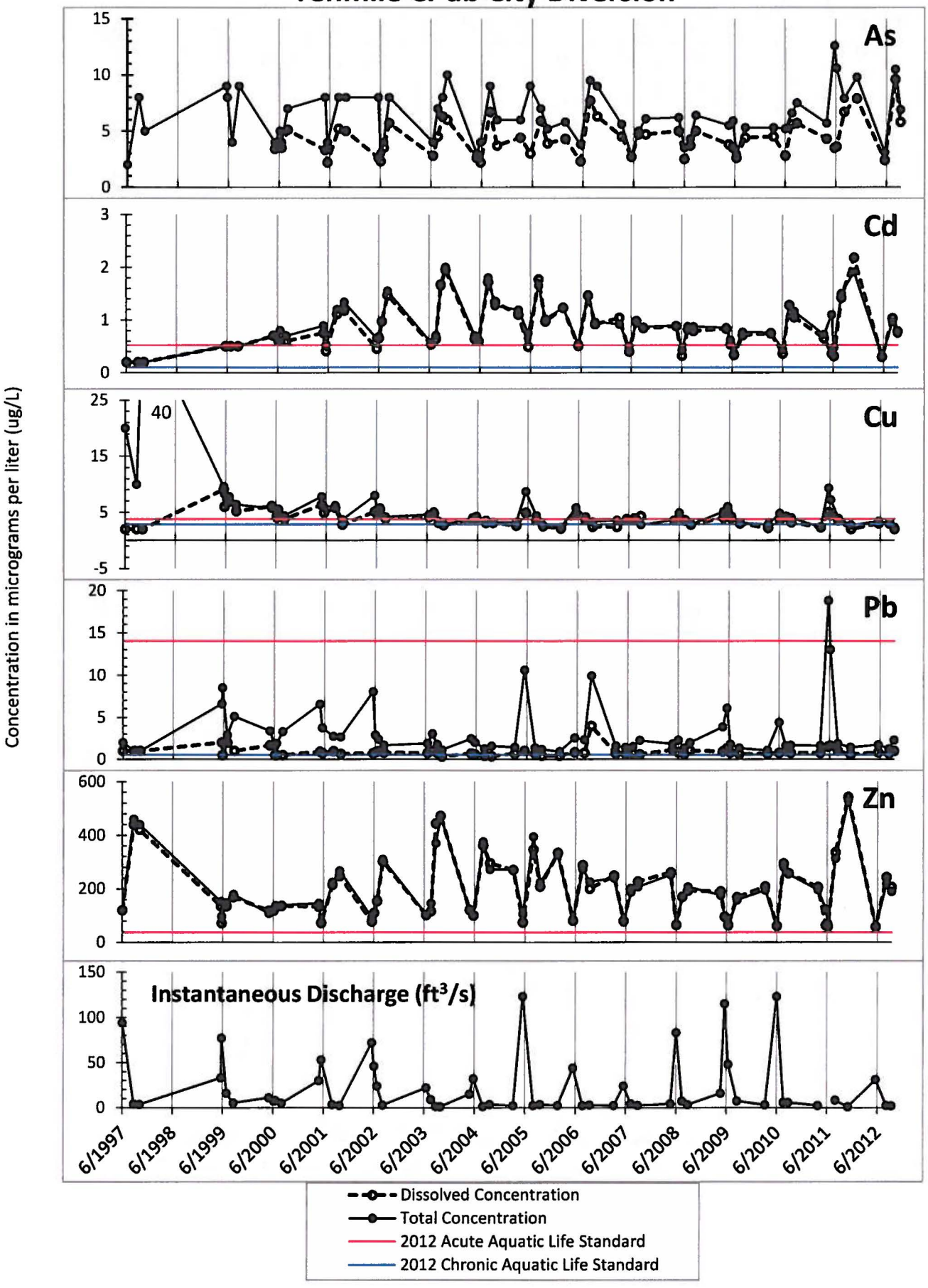


Beaver Cr Trib #2

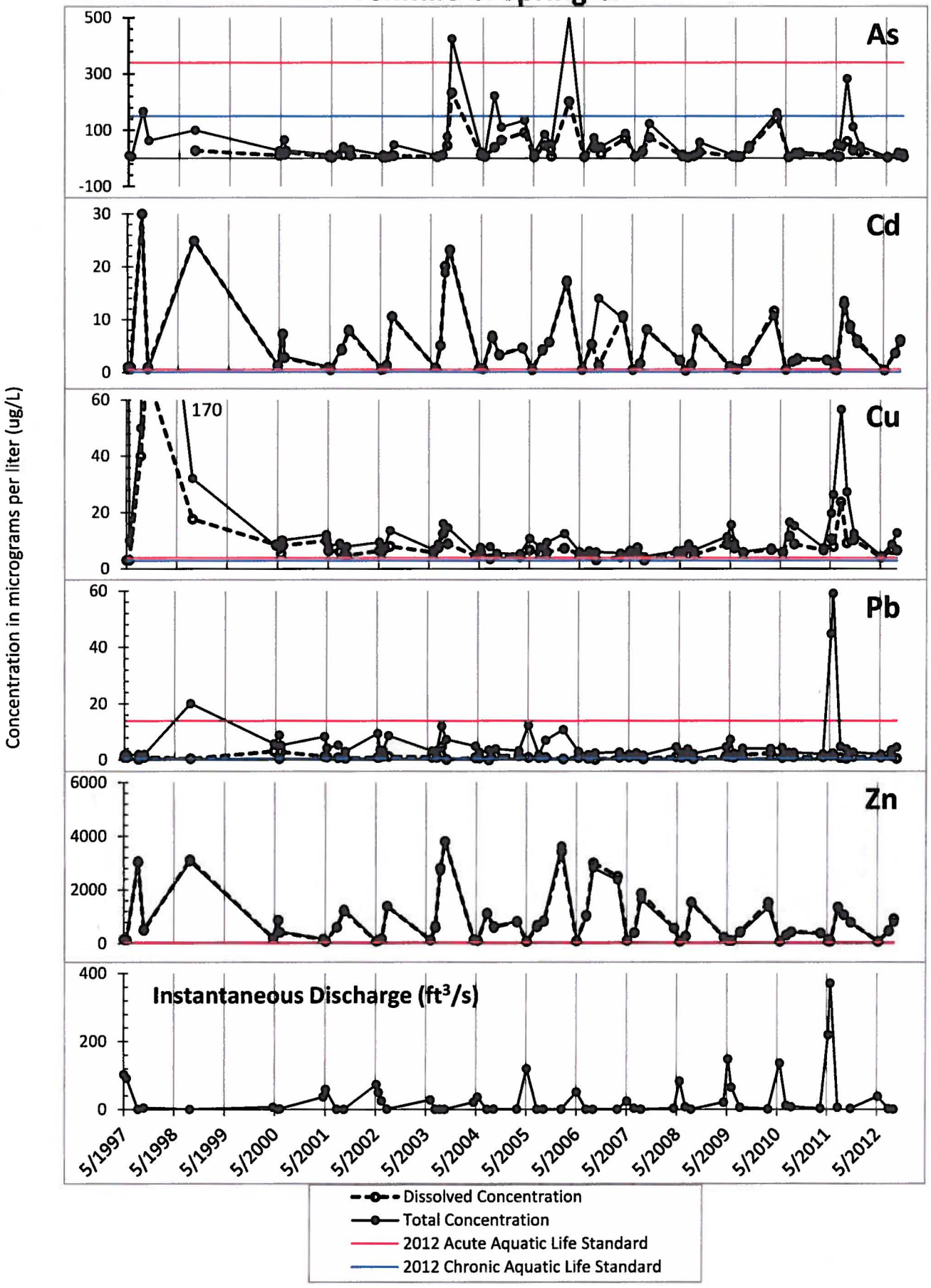


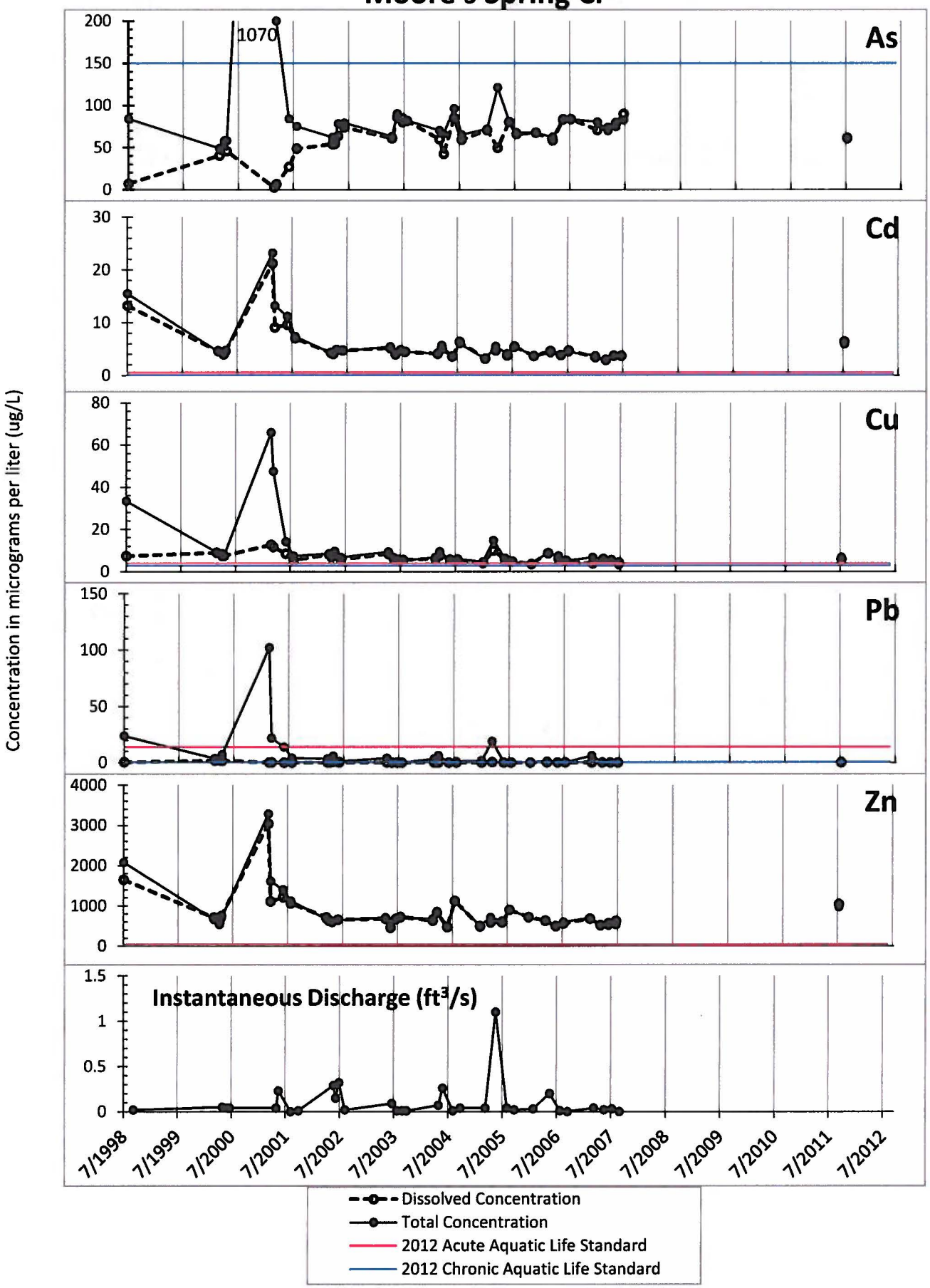

Poison Cr
As
Cd
Cu
937
Pb
Zn
Instantaneous Discharge (ft³/s)
Concentration in micrograms per liter (ug/L)
7/1997
7/1998
7/1999
7/2000
7/2001
7/2002
7/2003
7/2004
7/2005
7/2006
Dissolved Concentration
Total Concentration
2012 Acute Aquatic Life Standard
2012 Chronic Aquatic Life Standard

Tenmile Cr ab City Diversion

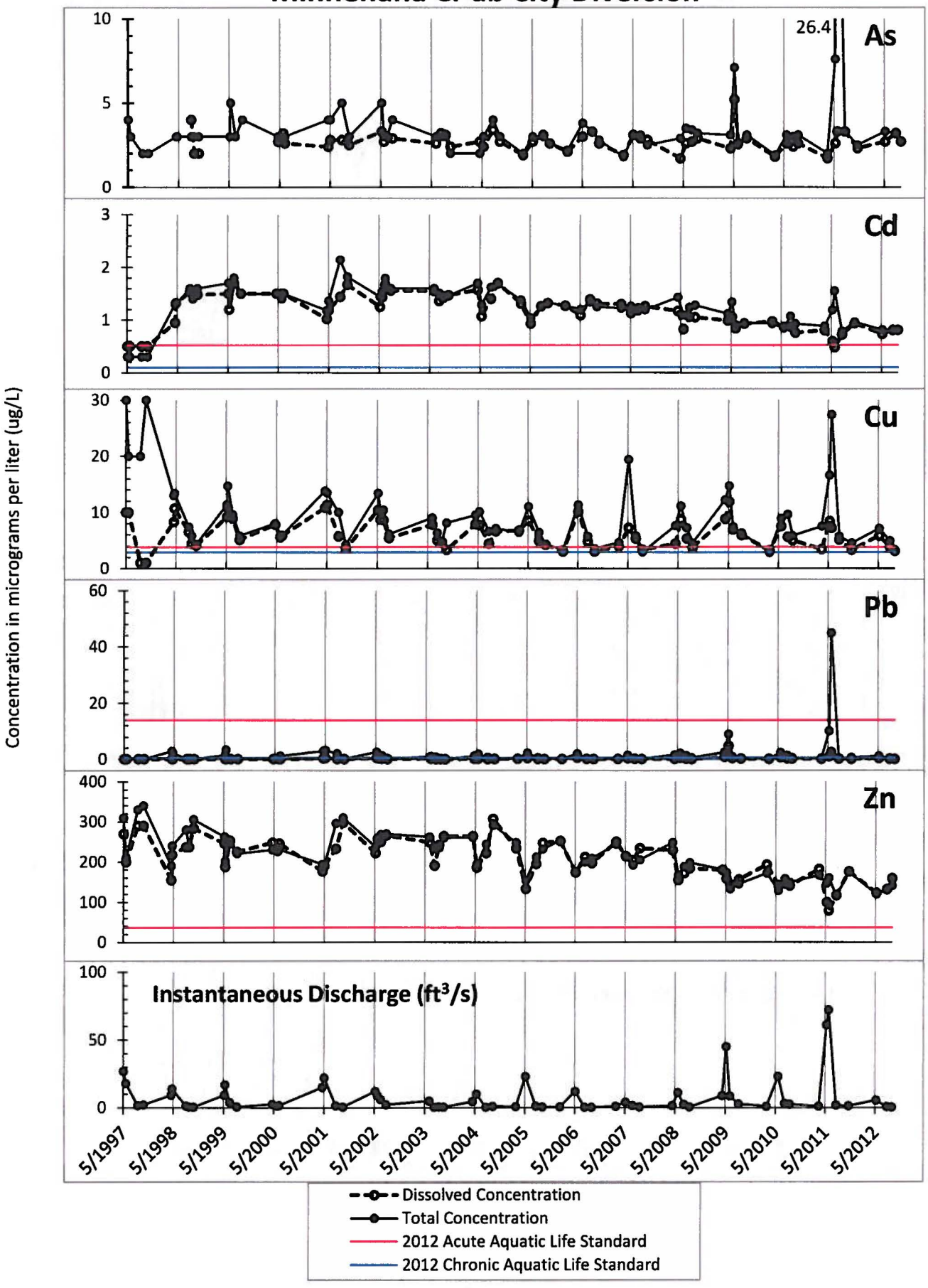


Tenmile bl Spring Cr




Moore's Spring Cr
As
Cd
Cu
Pb
Zn
Instantaneous Discharge (ft³/s)
1070
Concentration in micrograms per liter (ug/L)
7/1998
7/1999
7/2000
7/2001
7/2002
7/2003
7/2004
7/2005
7/2006
7/2007
7/2008
7/2009
7/2010
7/2011
7/2012
Dissolved Concentration
Total Concentration
2012 Acute Aquatic Life Standard
2012 Chronic Aquatic Life Standard

Minnehaha Cr ab City Diversion



Tenmile Cr near Rimini (Moose Cr)