

Water Quality Technical Report

State Highway 82 / Entrance to Aspen
Environmental Reevaluation

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Colorado Department of Transportation, Region 3
and
Federal Highway Administration, Colorado Division

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1.0 Affected Environment

This report provides a reevaluation of the water quality analysis presented in the 1997 State Highway 82 Entrance to Aspen Final Environmental Impact Statement (FEIS), for the Preferred Alternative selected in the Record of Decision (ROD) issued in August 1998.

1.1 Methodology

The water quality analysis prepared for the FEIS (pages IV-42, V-26 and VI-1) was reviewed, and current water quality regulations and standards were compared against those in force at the time of the FEIS. Additionally, recent databases listing impaired waters and the EPA Total Maximum Daily Load (TMDL) program were reviewed for the current status of waters in the project area.

1.2 Regulatory Overview

The 1997 FEIS states the name of the state water quality regulatory agency as the “Colorado Department of Health” in Section 2b, Stream Classification (page IV-42). The name of the state regulatory body has changed from the Colorado Department of Health to the Colorado Department of Public Health and Environment (CDPHE).

In 1998, the CDPHE instituted a 303(d) List. The 303(d) List identifies water quality limited segments still requiring Total Maximum Daily Loads (TMDLs) within Colorado. This list was prepared to meet Section 303(d) of the federal Clean Water Act which requires that states submit to the U.S. Environmental Protection Agency (EPA) a list of those waters for which technology-based effluent limitations and other required controls are not stringent enough to implement water quality standards (WQCD, 1998).

The State is required to prioritize the water bodies or segments (rivers, streams, lakes reservoirs) listed on the 303(d) list, based on the severity of pollution, and then to determine the causes of the water quality problem and allocate the responsibility for controlling the pollution. This analysis is called the TMDL Process, and results in the determination of the amount of a specific pollutant that a segment can receive without exceeding a water quality standard (the TMDL), and the apportionment to the different contributing sources of the pollutant loading (WQCD, 1998). The 303(d) list has been updated every year since 2000 (CDPHE, 2006).

1.3 Description of the Existing Condition

As reported in the 1997 FEIS, Castle Creek, Maroon Creek and the Roaring Fork River are the primary water bodies in the project area. The characteristics and status of waters within the project area have not changed since publication of the FEIS.

The designated beneficial uses of the water bodies in the project area have not changed since publication of the FEIS. However, the document that lists the designated uses has been updated. The bulleted list of designated uses in Section 2b of the FEIS (page IV-43) remains accurate, based on the latest information (CDPHE, Water Quality Control Division (WQCD), April 2004).

The regulatory segmentation of the streams in the project area has not changed (FEIS, page IV-43), but the document that defines the stream segments in the project area has been updated (CDPHE, WQCD, 2006).

No water bodies in the project area have been listed as impaired or added to the Colorado 303(d) list for water quality limited segments subject to TMDL regulations (Water Quality Control Commission, April 30, 2006), indicating that Castle Creek, Maroon Creek, and the Roaring Fork River currently meet all federal and state water quality standards. The water quality standards have been updated since publication of the FEIS. The most current standards are found in the Regulation 33 Tables (WQCD, 2006) and are presented in Table 1 in Appendix A.

Two components of the Preferred Alternative have been constructed since the publication of the FEIS and ROD: (1) Owl Creek Road and West Buttermilk Road have been relocated to create a new, signalized intersection with State Highway 82 near the Buttermilk Ski Area; and (2) the roundabout at the Maroon Creek Road intersection has been completed.

In addition, the Maroon Creek Bridge Replacement Project is currently under construction, scheduled for completion by spring of 2008. This project is being constructed as a bridge replacement without any increase in roadway capacity. However, it will accommodate the Entrance to Aspen Preferred Alternative in the future by removing the center median and re-striping for two general-purpose lanes and two exclusive bus lanes (see the Introduction to the Technical Report Volume for more detail).

The intersection of Truscott Drive and State Highway 82 was completed in 2001. While this intersection is not part of the Entrance to Aspen Project, its configuration accommodates the alignment for the east approach to the Maroon Creek Bridge Replacement Project.

A transportation easement across the Marolt-Thomas Open Space was conveyed from the City of Aspen to CDOT in August of 2002, as part of land exchange and mitigation agreements between CDOT and the City of Aspen and Pitkin County. (Refer to Appendix A and B in the 1998 Record of Decision for details of the open space conveyance agreements and mitigation commitments.)

2.0 Environmental Consequences

2.1 Methodology

The assessment of water quality impacts from construction, operations and maintenance in the FEIS was reviewed for the ROD Preferred Alternative based on updated information. Officials with CDOT, Pitkin County and the City of Aspen were consulted to determine current ice and snow management practices

within the project corridor, and the potential effects of applicable snow and ice management on water quality were reviewed in existing literature. To update the FEIS information regarding potential hazardous materials storage or transport during construction, the Colorado State Patrol (CSP) was contacted to verify its current role in hazardous materials spill response.

2.2 Preferred Alternative

The information below provides updates on current conditions in the project area related to potential water quality impacts. The impacts as presented in the 1997 FEIS are still valid and no new or greater impacts to water quality were identified in this reevaluation.

Water quality in the project area could be affected by excess sediment being released to water bodies or by spills of hazardous materials during construction, operation and maintenance activities. The FEIS characterization of potential water quality impacts in Section 4b (page V-26) remains valid.

Based on existing water quality in the study area, there is no evidence of any substantive, long-term effect on water quality from the intersection or roundabout construction. The current construction of the Maroon Creek Bridge is being done using Best Management Practices (BMPs) to reduce erosion and sedimentation, and is in compliance with the National Pollutant Discharge Elimination System (NPDES) permit. There have been no reported hazardous material spills related to construction of any of the Preferred Alternative components. The CSP (Troop 8-C Hazardous Materials Transport Safety and Response) remains the Designated Emergency Response Authority, as described in the 1997 FEIS.

Management of snow and ice has changed from those described in the “Winter Runoff Constituents” section in the FEIS (page V-27). Roads in the project study area are maintained by the City of Aspen and CDOT. Each entity uses different methods of winter road maintenance. CDOT maintains State Highway 82 near the Pitkin County Airport to the intersection with Cemetery Lane. CDOT uses magnesium chloride in this area which includes the State Highway 82 crossing of Maroon Creek (Mertes, 2006). The City of Aspen maintains State Highway 82 from Cemetery Lane to and within the city limits. In this area, the City of Aspen does not use chemical deicers. The City plows and uses 3/8-inch washed chips for sanding. The City also sweeps and flushes the streets (Krueger, 2006; Cassin, 2006). This area includes the State Highway 82 crossing of Castle Creek.

In 2001, CDOT published a study (Fischel, 2001) describing the environmental effects of different deicers. According to the study, magnesium chloride can increase the salinity of the soil near roadways where it is applied. Magnesium chloride may also contribute to the mobilization of trace metals from the soil to surface- and groundwater. Chloride-based deicers have the potential to increase the salinity of rivers, streams and lakes. Since the dilution of deicers from the roadways to nearby streams is estimated to range from 100- to 500-fold, salinity increases are only likely to occur in slow-flowing streams and small ponds. Because water bodies in the project area are generally fast-moving, it is not likely that Maroon Creek, Castle Creek or the Roaring Fork River would be noticeably impacted. Because increased salinity has been reported in groundwater at a distance of more than 300 feet from roadways (Fischel, 2001), some wetlands and areas of standing water could be affected.

The FEIS acknowledges the potential for some increased salinity and trace-metal impacts due to deicing in the study area. Based on current de-icing practices and water quality in the study area, none of these impacts is expected to be significant, and no water quality violations are expected to occur. The FEIS conclusion that potential water quality impacts would not be significant remains valid.

3.0 Mitigation Measures

The mitigation measures described in the 1997 FEIS (page VI-1) have been implemented for components of the Preferred Alternative already constructed or currently under construction. These measures also would be implemented during construction of future components of the Preferred Alternative, and are adequate to protect water resources in the project area. No additional mitigation would be needed, based on current conditions and regulations. Impacts and mitigation measures are summarized in the following section.

4.0 Summary of Impacts and Mitigation

Impacts are summarized below in Table 4-1 as identified in both the FEIS and this reevaluation. Mitigation measures listed in the table are those from the 1998 ROD, unless additional measures are noted as being required due to findings of the reevaluation.

**Table 4-1
Summary of Impacts and Mitigation Measures**

Topic	FEIS Impact	Reevaluation Impact	Mitigation Measures
Water Quality	<p>Construction</p> <p>Sediment discharges during construction of footings in Maroon and Castle Creeks resulting in increased suspended solids and turbidity</p> <p>Sediment discharges resulting in loss of water clarity, impacts to trout spawning areas, and increases in soluble constituents</p> <p>Spills resulting in water surface sheen and coating of vegetation and shoreline rocks</p> <p>Large spill resulting in wildlife mortality</p>	No change	<p>Adhere to conditions described in the NPDES Stormwater Permit</p> <p>Adhere to CDOT BMPs</p> <p>Develop and implement a water quality and stormwater management plan</p> <p>Use of water quality and erosion control specifications</p> <p>Develop and implement a spill prevention and emergency response plan</p>

Topic	FEIS Impact	Reevaluation Impact	Mitigation Measures
	<p>Operations and Maintenance</p> <p>PCBs and organic priority pollutants resulting from a hazardous waste spill that enters local streams</p>	No change.	
	<p>Winter Runoff Constituents</p> <p>Potential water quality impacts of salts being carried into streams with winter runoff (because the existing and proposed road surface areas are similar, there should be little if any difference in this impact)</p>	No change. (City no longer uses de-icers; CDOT uses them at east end of study area. Potential salinity impacts likely less than reported in FEIS due to current City de-icing practices)	

5.0 Agency Coordination

The following entities were contacted for information included in this reevaluation:

- City of Aspen, Environmental Health Department
- City of Aspen, Transportation

All agency and organizational contacts, as well as other data sources, are listed in Section 6.0.

6.0 References

Cassin, Lee. June 19, 2006. City of Aspen Environmental Health Director. Personal communication with HDR Engineering via e-mail. Snow and ice control practices within the project area.

Colorado Department of Public Health and Environment (CDPHE). 2006. "Section 303(d)/Total Maximum Daily Load (TMDL) Program." Site accessed August 15, 2006.

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CDPHE, Water Quality Control Commission. April 30, 2006. "Section 303(d) List Water-Quality-Limited Segments Requiring TMDLs." 5CCR 1002-93. Regulation #93.

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- CDPHE, WQCD. March 24, 1998. "Water Quality Limited Segments Still Requiring TMDLs: Colorado's 1998 303(d) list and related water quality management lists."
[http://www.cdphe.state.co.us/op/wqcc/SpecialTopics/303\(d\)/303dtext.pdf](http://www.cdphe.state.co.us/op/wqcc/SpecialTopics/303(d)/303dtext.pdf)
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- Krueger, John. June 14, 2006. City of Aspen Director of Transportation. Personal communication with HDR Engineering via e-mail. Snow and ice control practices within the project area.
- Mertes, Pete. June 13, 2006. Colorado Department of Transportation Resident Engineer. Personal communication with HDR Engineering via e-mail. Snow and ice control practices within the project area.

7.0 List of Preparers

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APPENDIX A – WATER QUALITY

Table 1
Numeric Water Quality Standards for the Roaring Fork River and Tributaries within the Project Area - 2006

Parameter	Units	Maximum	Minimum
Dissolved Oxygen			
	w/o spawning	mg/l	-
	w/ spawning	mg/l	-
pH	S.U.	9.0	6.5
Fecal Coliforms			
	F. Coli	/100 m	200
	E. Coli	/100 ml l	126
Ammonia			
	acute	mg/l	TVS ¹
	chronic	mg/l	0.02
Chloride			
	acute	mg/l	0.019
	chronic	mg/l	0.011
Cyanide		mg/l	0.005
Sulfur		mg/l	0.002
Boron		mg/l	0.75
Nitrite		mg/l	0.05
Nitrate		mg/l	10.0
Chlorine		mg/l	250
Sulfate		mg/l	WS ²
Arsenic			
	acute	µg/l	50 (total recoverable)
Cadmium			
	acute	µg/l	TVS (dissolved) (trout)
	chronic	µg/l	TVS (dissolved)
Chromium			
	III acute	µg/l	50 (Trec)
	VI acute	µg/l	16
	VI chronic	µg/l	11
Copper			
	acute/chronic	µg/l	TVS
Iron			
	chronic	µg/l	WS (dissolved)
	chronic	µg/l	1000 (total recoverable)

Parameter		Units	Maximum	Minimum
Lead	acute/chronic	µg/l	TVS	-
Manganese	chronic	µg/l	WS	-
	acute/chronic	µg/l	TVS	-
Mercury	chronic	µg/l	0.01 (total)	-
Nickel	acute/chronic	µg/l	TVS	-
Selenium	acute	µg/l	18.4	-
	chronic	µg/l	4.6	-
Zinc	acute/chronic	µg/l	TVS	-

Source: Colorado Department of Public Health and Environment, Water Quality Control Division. 2006. Regulation No. 33 Tables – Stream Classifications and Water Quality Standards. <http://www.cdphe.state.co.us/op/regs/waterregs/33tables122005.pdf>

Notes:

- 1: Table Value Standard (TVS). This designation refers to a numerical criteria set forth in the Basic Standards and Methodologies for Surface Water. Some of the standards involve equations that factor in the hardness of the water.
- 2: For Water Supply, the standard is the less restrictive of either the existing quality as of January 1, 2000 or 250 mg/l for Sulfate; 300 mg/l for Iron and 50 mg/l for Manganese