

### 3.6 Regulated Materials and Historic Mining

#### 3.6.1 What are the concerns related to regulated materials and historic mining and why are they important to this project?

Regulated materials are hazardous substances, hazardous waste, or petroleum products. The Colorado Department of Transportation (CDOT) evaluated the potential for harm from these regulated materials by identifying the presence or likely presence of an existing or past release of hazardous materials on a property. Historic mining is included in the discussion of regulated materials because there are mine tailings and other mining waste contamination in the Corridor (such as heavy metals and acids). Encountering contaminants in soils, groundwater, and surface water can:

- Increase worker health and safety requirements
- Result in project delays
- Increase construction costs due to remediation and disposal
- Increase land purchase liability



*Example of Historic Mining Site*

These contaminants can indirectly impact nearby habitats, residents, and employees if appropriate steps to contain them are not taken. Examples of commonly regulated materials are asbestos; lead-based paint; heavy metals such as cadmium, mercury, and zinc; dry-cleaning solvents; and materials stored in underground storage tanks, such as gasoline and diesel. Section 2 of the *I-70 Mountain Corridor PEIS Regulated Materials and Historic Mining Technical Report* (CDOT, March 2011) provides regulatory authority information for these materials.

The Colorado Department of Transportation identified known and potential contamination in the Corridor to help reduce the possibility of exposing people and the environment to regulated materials. Identifying contamination also helps to plan for project costs related to land purchase and to compare the costs of avoiding contamination with the costs for hazardous materials handling, disposal, and remediation requirements.

The project will use regulated materials during construction, which also increases the chances of unintended release into the environment. Likewise, the operation of the I-70 highway includes the transportation and use of regulated materials, which can also increase the likelihood of release along the Corridor.

#### 3.6.2 What study area and process were used to analyze regulated materials and historic mining sites?

The study area for regulated materials and historic mining sites varies depending on the typical extent of exposure. Larger or more contaminated sites, such as Superfund sites, often include a broad reach, while hazardous spill sites are usually cleaned up quickly and are more limited in extent. Federal and state agencies maintain databases for environmental records. Industry standards for the exposure areas (generally a radius) are used to search the different records. The search area radii range from a quarter of a mile to 1 mile.

The lead agencies reviewed these records and studied the locations of known or potential sites in relation to areas that construction of Action Alternatives may disturb. Additional research was conducted to identify and evaluate historic mining sites because stakeholders expressed particular concern about these sites and the potential for Action Alternatives to disturb them. Data for the evaluation of regulated

### 3.6. Regulated Materials and Historic Mining

materials and historical mining sites were primarily collected in the 2002 to 2003 timeframe. The Colorado Department of Transportation determined that these data remain valid for the purposes of this Programmatic Environmental Impact Statement (PEIS) because they provide an overall assessment of the magnitude of these issues and their potential impacts on the project. The number and locations of regulated material sites is dynamic because of changes in population and industry-base within the five county project area. Although what has been identified may change over time, the types of materials identified in this document are characteristic of what will be encountered during Tier 2 processes. This information will be identified for each Tier 2 process.

#### 3.6.3 What agencies have CDOT and the FHWA coordinated with and what are their relevant issues?

Agency comments regarding regulated materials and historic mining sites are summarized below. They come from the Colorado Department of Public Health and Environment, the Environmental Protection Agency, and municipalities and stakeholder groups along the Corridor.

The Clear Creek Foundation and Upper Clear Creek Watershed Association raised concerns about mill sites within the I-70 highway right-of-way in Clear Creek County. Additional surveys were conducted to identify all mill sites within the I-70 highway right-of-way. **Section 3.6.4** provides a summary of results.

Comments include concerns about the relative impacts of mills, mine waste, tunnel drainages, and exposed mineral veins (mineralized rock) on water quality that result from the Action Alternatives. **Sections 2.2 and 3.3** of the *I-70 Mountain Corridor PEIS Regulated Materials and Historic Mining Technical Report* (CDOT, March 2011) discuss how mine waste materials, tunnel drainage, and mineralized rock might affect water quality. Additional information is in the *I-70 Mountain Corridor PEIS Water Resources Technical Report* (CDOT, March 2011). Further studies will be conducted during Tier 2 processes (see **Section 3.6.6**).

Agencies requested more detail on avoidance and mitigation strategies for regulated materials and historic mine sites. **Section 3.6.7** summarizes mitigation strategies. More detailed mitigation strategies will be provided in Tier 2 when impacts are more clearly defined (see **Section 3.6.6**).

Agencies expressed concerns about the likelihood of road construction as a source of metals loading. Further detail will be provided during Tier 2 processes (see **Section 3.6.6**).

#### 3.6.4 Where are the areas of regulated materials and historic mining in the Corridor?

The Colorado Department of Transportation searched records to determine the presence or likely presence of hazardous substances (including those from historic mining activities) or petroleum products that have been released or are present in the Corridor. The following information summarizes findings on regulated material sites, incidents, and historic mining sites in the Corridor. The *I-70 Mountain Corridor PEIS Regulated Materials and Historic Mining Technical Report* (CDOT, March 2011) provides detailed information, including the location of all known regulated materials and historic mining sites in the Corridor.

Information gathered in January 2010 identified the locations of Superfund sites and mine-related mill sites in and surrounding the I-70 highway right-of-way (see **Table 3.6-1** and **Figure 3.6-1**). This information is important because a Superfund site is one where major contamination issues are present. Even though directly impacting these Superfund sites should be avoided, these contaminants may have leached from the site to the groundwater and could be encountered during construction if excavation encounters groundwater. Five historic mine-related cleanup sites (operable units) within the Clear Creek/Central City Superfund site are located within the Corridor. Several other Superfund-site operable

### 3.6. Regulated Materials and Historic Mining

units located near Black Hawk and Central City are outside the Corridor but contain mine-related materials that contribute to nonpoint source impacts in the lower Clear Creek Basin.

**Table 3.6-1** lists and **Figure 3.6-1** shows several known registered generators of waste in the Corridor. These registered generators could be a source of contamination if the materials were mismanaged. However, none of those sites were associated with contamination, and CDOT does not expect any of the sites to affect alternatives in the Corridor.

Two overlapping lists of reported hazardous substance spill incidents are from the Environmental Protection Agency Emergency Response Notification System and from the National Response Center Spill Sites. These lists denote areas of concern in the Corridor. See **Figure 3.6-1** and **Table 3.6-1**. These spills come from various sources. Materials spilled included petroleum, paint, acetylene cylinders, transformer oil with polychlorinated biphenyls, battery acid, sulfuric acid, hydrogen peroxide, formaldehyde mixture, antifreeze, asphalt, and calcium chloride. Although some include multiple spills along the I-70 highway from trucks transporting hazardous materials, the Colorado State Patrol and/or federal, state, and local hazardous materials emergency response personnel generally clean these spills up immediately to protect the environment. The number of transport spills has increased between 1990 and 2002.

**Table 3.6-1. Federal and State Superfund Sites, Generators, and Releases**

County	Superfund Sites	LQG Sites	SQG Sites	ERNS Spill Sites (1987 to 1997)	NRC Spill Sites (1990 to 2002)
Garfield	0	1	10	2	10
Eagle	0	0	8	15	14
Summit	0	0	4	6	22
Clear Creek	3	0	0	1	15
Jefferson	0	2	32	16	13
Total	3	3	54	40	74

**Key to Abbreviations/Acronyms**

ERNS = Emergency Response Notification System  
 NRC = National Response Center

LQG = Large Quantity Generator  
 SQG = Small Quantity Generator

To protect the traveling public from exposure to spills in the Eisenhower-Johnson Memorial Tunnels, transport of hazardous materials through the tunnels is not allowed during normal operations, and trucks carrying hazardous materials must reroute via US 6 over Loveland Pass. However, when Loveland Pass is closed (such as during adverse weather conditions), and the I-70 highway is open, placarded loads are escorted through the tunnel at the top of every hour spaced about 800 feet apart. Passenger vehicles and other traffic are not allowed in the tunnel while placarded loads are being transported.

Numerous sites were identified with underground storage tanks, aboveground storage tanks, and leaking underground storage tanks associated with retail fuel stations and vehicle maintenance facilities. See **Table 3.6-2**. These locations are also represented on **Figure 3.6-1** as large quantity generators. These tank locations are important because they could be the source of a contamination spill, even if it has not been reported as a leaking tank. The contamination leaks often occur over a long time undiscovered, traveling through the ground and entering the groundwater. Those contaminants in the groundwater then travel horizontally away from the source and could be encountered when a project conducts deep excavation, such as those for installing bridge piers. A majority of these sites are clustered at population centers along the I-70 highway and near interchanges. Additional information will be provided as well as maps depicting the locations of these sites during Tier 2 processes. See **Section 3.6.6**.

### 3.6. Regulated Materials and Historic Mining

**Table 3.6-2. Listed Storage Tank Sites**

County	Cities	Total USTs on Record	Active USTs on Record	Active ASTs	Inactive LUST Sites	Active LUST Sites
<b>Garfield</b>		154	49			
	Glenwood Springs			0	39	1
<b>Eagle</b>		297	123			
	Avon			0	10	3
	Eagle			6	12	0
	Edwards			4	4	1
	Gypsum			7	4	0
	Minturn			0	3	0
	Vail			4	13	3
	Wolcott			1	2	1
<b>Summit</b>		170	73			
	Dillon			0	7	1
	Frisco			0	9	3
	Silverthorne			1	15	8
<b>Clear Creek</b>		117	52			
	Idaho Springs			0	9	2
	Silver Plume			0	0	1
	Georgetown			0	4	2
	Downieville			0	1	1
	Dumont			0	0	1
<b>Jefferson</b>		3	3			
	Genesee			0	1	0
	El Rancho			0	1	0

*Inactive = LUST sites have been adequately addressed according to requirements of the Division of Oil and Public Safety.*

*Active = LUST sites are being investigated or cleaned up and monitored under the Division of Oil and Public Safety.*

#### Key to Abbreviations/Acronyms

AST = aboveground storage tank    LUST = leaking underground storage tanks    UST = underground storage tank

The Corridor passes through areas of substantial historic metals mining and other types of mining. The Environmental Protection Agency lists 789 historic mines within a 2-mile radius of the Corridor. There are approximately 754 historic mines located between I-70 highway milepost 222 and milepost 242. The exact location of many mine tailings and mill waste piles are unknown, but **Figure 3.6-1** shows the approximate locations of these sites along the Corridor. Some of the mining sites shown on the map are listed on the Clear Creek/Central City Superfund National Priorities List sites. The National Priorities List is the list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. These mine and mill waste piles are a source of contaminants if disturbed.

Many of the historic mines in the Corridor are in much the same condition as when mining activity ceased. Their present-day mine features pose hazards and constraints on proposed Corridor modifications.

### 3.6. Regulated Materials and Historic Mining

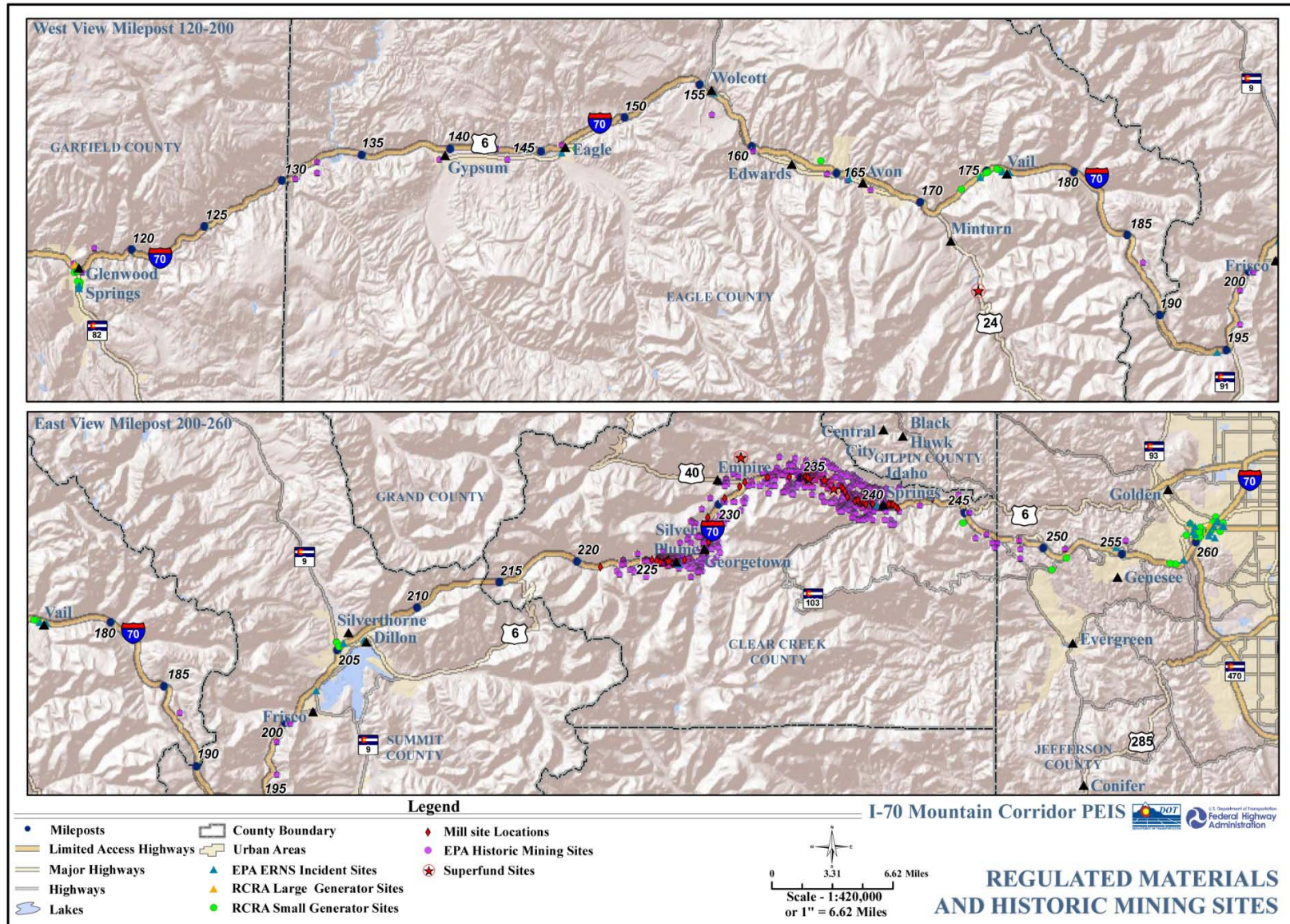
- Mill sites are a concern because ore that was processed in milling operations was ground to a fine powder (like talcum powder) and then mixed with chemicals or mercury to remove the gold. The material is so fine that it is much more reactive and more likely to leach pollutants into the environment than pebble, cobble, or boulder-sized material. Therefore, the fine size, the possible presence of processing chemicals, and local volumes of waste at mill sites combine to have the most potential environmental impacts of all mining sites. Mine waste is less of a concern than mill sites because the rock sizes at mine dumps vary from huge boulders to powder.
- Other mine wastes and metal-loading concerns include acid mine waters occurring in the Silver Plume, Georgetown, Empire Junction, Dumont, Fall River, Idaho Springs, and Hidden Valley areas adjacent to the I-70 highway that could be released into the environment if disturbed. All of these areas of historic mining also indicate high levels of natural metals in the substrate that could be a source of metal loading if disturbed sediments containing these metals are released into the streams.
- Mineralized rock is a concern because exposure of mineralized veins can also create metal-rich, acid rock drainage that might affect water quality. Veins have more metals than mine waste or mill tailings (since the waste is, by definition, too low in metals to be processed profitably). However, heavily veined areas that are exposed by road cuts along the I-70 highway are limited in size and are slower to react than crushed rock.

Below is a summary of the cleanup efforts that have been conducted or are ongoing in the Clear Creek Watershed to address historic mining contamination in this area.

- The Clear Creek Watershed Foundation has developed roughly 60 actual and/or potential watershed-based sustainability projects that promote innovation, cooperation, and cost-efficiency. Orphan (Abandoned) Mine Remediation is one project that Clear Creek Watershed Foundation has been conducting, facilitating, and expediting cleanup of the 1,600 or so remaining orphan mine/mill sites not listed as priorities in the Clear Creek/Central City Superfund Operating Units Record of Decision. This work supports remediation efforts in the Clear Creek/Central City Superfund Study Area.
- The Environmental Protection Agency Superfund Program has been ongoing since 1983. In 2009, the Environmental Protection Agency announced \$5 million in new funding through the American Recovery and Reinvestment Act of 2009 for the Clear Creek/Central City Superfund Site in Clear Creek and Gilpin counties. The funding was to accelerate the hazardous waste cleanup already underway at the site. Some of the activities during the 2010 construction season included a pipeline to transport the mine drainage and proposed plan to allow active treatment of mine wastes at a new water treatment plant.

### 3.6. Regulated Materials and Historic Mining

Figure 3.6-1. Regulated Materials and Historic Mining Sites



### 3.6.5 How do the alternatives potentially affect regulated materials and historic mining sites?

Direct and indirect impacts are associated with construction of all Action Alternatives, including the Preferred Alternative. Regulated materials and mining wastes in the vicinity of the project can cause increased cost to a project due to having to properly handle or mitigate for encountered contaminants. The project also uses these regulated materials and creates subsequent wastes from their use; these materials could accidentally be released into the project site and enter the environment during construction or operation.

#### How do the alternatives directly affect regulated materials and historic mining sites?

Direct impacts are associated with construction of all Action Alternatives, including the Preferred Alternative. All the Action Alternatives cause similar impacts on regulated and hazardous materials such as affecting underground storage tank/leaking underground storage tank sites and encountering residual spill material at spill sites. Construction of all Action Alternatives in Clear Creek County require the disturbance and reworking of many mine waste piles, including some designated Clear Creek/Central City Superfund sites. All Action Alternatives likely affect mine and mill waste, and acid mine drainage in the Silver Plume, Georgetown, Empire Junction, Dumont, Fall River, Idaho Springs, and Hidden Valley areas. A higher degree of impact is expected for the Rail with Intermountain Connection Alternative, Highway alternatives in Clear Creek County, Combination alternatives, and the Preferred Alternative if the Maximum Program of Improvements is implemented. There are no direct impacts from the No Action Alternative because improvements are not proposed for this alternative. In the process of constructing any of the Action Alternatives that will affect the I-70 highway roadbase, there is the potential to disturb historic mine waste located under the roadway, where there are potential unknown and uncharacterized mine waste materials in Clear Creek County.

Notable differences among alternatives include:

- The Advanced Guideway System Alternative results in fewer surface impacts of known regulated materials and wastes, such as mining/mill waste piles from the Superfund site along the old Clear Creek channel, mineralized veins, and storage tanks than the Rail with Intermountain Connection or Bus in Guideway Alternatives, since the Advanced Guideway System is capable of being fully elevated and has a smaller surface disturbance footprint than the other Transit alternatives.
- The Advanced Guideway System Alternative results in greater potential for subsurface impacts, such as by encountering contaminated groundwater, than the Rail with Intermountain Connection or Bus in Guideway Alternatives, because the pier construction for the Advanced Guideway System Alternative requires deeper excavation. Building of piers require considerably less surface disturbance and, if accurately mapped and carefully planned, could avoid mine adits that contain water.
- The Bus in Guideway Alternatives likely result in fewer impacts than the Rail with Intermountain Connection Alternative because the Bus in Guideway Alternatives are largely constructed in the median (a previously disturbed area) and require less surface excavation than for the Rail with Intermountain Connection Alternative.
- The Highway alternatives have similar overall impacts because they have comparable footprints. The highway consists of structured lanes through much of the ore body near Idaho Springs and Dumont. Reconstruction of the highway in this area will require considerable excavation and disturbance of underlying soil, some of which will be mine waste residual or mine adits containing water. An adit is a nearly horizontal passage from the surface into a mine.

### 3.6. Regulated Materials and Historic Mining

- The Highway alternatives likely have more impacts on historic mine waste materials than the Advanced Guideway System and Bus in Guideway Alternatives because less excavation is required for the latter alternatives. The Highway alternatives have fewer impacts compared to the Rail with Intermountain Connection Alternative because more excavation is required for the Rail with Intermountain Connection Alternative.
- The Combination Six-Lane Highway with Rail and Intermountain Connection Alternative has the most direct impacts on historic mine waste materials. This alternative has a greater construction footprint (as discussed above) that increases the likelihood for encountering historic mine waste.
- The Preferred Alternative has a range of impacts depending on adaptive management strategies used as the need arises. The Minimum Program includes non-infrastructure related components, Advanced Guideway System, and highway improvements. If later phases of improvements under the Maximum Program are implemented, it includes the same components as the Combination Six-Lane Highway with Advanced Guideway System Alternative with greater impacts due to additional areas of highway widening. For more detailed information on the Preferred Alternative, see **Chapter 2** of this document.

**Table 3.6-3** summarizes direct impacts on regulated materials and historic mine waste by alternative.

#### How do the alternatives indirectly affect regulated materials and historic mining sites?

Indirect impacts are those that could arise from the operations of the Corridor that are not directly related to the alternative component construction. The following impacts could occur during or after construction is complete:

- Future predictions indicate that truck traffic would increase considerably in western areas of the Corridor on summer weekdays, summer weekends, winter weekdays, and winter weekends. Increased truck traffic may be associated with a higher incidence of crashes and hazardous materials spills.
- Induced growth caused by easier access provided by the transportation improvements could increase travel demand and increase the number of traffic crashes because of this traffic increase.
- Induced growth also brings more regulated materials, including fertilizers and petroleum products, into the Corridor as demand for these materials increases.
- Construction detours temporarily reroute traffic, thereby exposing new areas to increased tanker truck traffic that could cause a spill if the truck is involved in an accident.
- Transit, Highway, and Combination alternatives have the potential to induce growth primarily in Summit and Eagle counties, which might cause indirect impacts from increased residential, industrial, and commercial activities.
- Positive indirect impacts could occur by correcting a problem in the area that affects the release of regulated materials, such as by addressing the curve safety issues that are associated with large tanker truck crashes along the Corridor or by improving a spill plan in the area where spills are more prevalent.

The No Action Alternative and Minimal Action Alternative are expected to have the fewest induced growth related impacts. However, these alternatives are associated with a higher incidence of crashes and spills as a result of on-going traffic delays and congestion.

The Highway alternatives may result in increased truck transport; however, they also address safety issues and crash areas, especially sharp curves that have high incidents of crashes, which is expected to lower the overall truck spill incidences. Changes in land use patterns may require added truck service, which could increase truck travel on the I-70 highway.



### 3.6. Regulated Materials and Historic Mining

The Combination Alternatives have the widest footprint that could impact mineralized veins in the mountain side, exposing these veins to weathering that increase the acid water and metal content leaving the site and entering the Corridor waterways. These alternatives could also destabilize mine wastes such as mine tailings or acid mine waters that could enter the environment over time if not properly addressed at the time of disturbance. The Combination alternatives contain highway safety improvements that would be expected to reduce crashes and lower the overall number truck spill incidences.

**Table 3.6-3** summarizes indirect impacts on regulated materials and historic mine waste by alternative.

#### How does construction of the alternatives affect regulated materials and historic mining sites?

Vehicles and equipment such as fuel storage tanks used during construction activities have the potential to release hazardous materials, mainly petroleum products. Appropriate construction safety procedures and equipment stockpiling methods will be used to minimize releases. All releases will be reported and addressed under appropriate regulatory guidance. **Section 3.6.7** summarizes mitigation strategies.

Construction activities increase the likelihood for encountering existing and unknown regulated materials. These concerns include impacting historic mining wastes including tailings and contaminated water trapped in old mining tunnels; the likelihood of encountering these kinds of issues is higher in the Middle and Lower Clear Creek areas where mining activities were prevalent. In addition, dewatering activities during construction could potentially alter existing groundwater contamination plumes and potentially affect additional properties. Construction dewatering requires coordination with Colorado Department of Public Health and Environment to determine necessary treatment and handling of extracted water before final discharge/disposition. Heavy truck traffic may also increase with an increase in construction, which has the potential for higher material spills.

#### What are the alternative effects on regulated materials and historic mining sites in 2050?

There may be changes to regulated materials and historic mining sites by the year 2050. Further, acidic, heavy-metal laden mine water that drains from historic mines, and mine wastes, such as tailings and waste rock, contribute to the nonpoint source impacts on the Clear Creek basin that are anticipated to occur through 2050. However, the Environmental Protection Agency and local watershed groups will continue remedial efforts by installing erosion control best management practices and treating acid mine drainage. Construction of the Action Alternatives in the Corridor results in additional erosion further exposing historic mining tailing and/or mineralized rock unless this material is handled to reduce releases into the environment. A contingency plan for handling these materials will be implemented to mitigate these impacts. The impact from historic mining sites is expected to continue to decrease over time, as trends indicate improvements in water quality over the past 30 years. The Action Alternatives are not expected to have any effect on these improving trends through 2050.

Clear Creek is a drinking water source for more than 350,000 people living in the Denver metropolitan area and is a favored place for kayaking, rafting, fishing, and wildlife observation. There will be continued efforts to reduce human exposure to heavy metals, primarily lead, arsenic, and cadmium associated with these sites. For more on cumulative effects, see **Chapter 4, Cumulative Impact Analysis**.

### 3.6. Regulated Materials and Historic Mining

**Table 3.6-3. Summary of Impacts**

Alternative	Areas Likely to Be Encountered				Identified Direct Impacts
	Potential Direct Impacts (Potential to Encounter Regulated Materials or Historic Mine Waste)				
	Residual Spill Materials	LUST / UST Sites	Historic Mine Waste Materials	Acid Rock / Acid Mine Drainage	
No Action	No	No	No	No	No
Minimal Action	Yes	LUST sites in Corridor communities	Possible effects from disturbance of placer mines along Clear Creek. Potential unknown / uncharacterized mine waste materials in Clear Creek County.	Possible acid rock / acid mine drainage from tunnel enhancements and rock cuts in Clear Creek County.	All mine waste material areas listed in Table 6 of the <i>I-70 Mountain Corridor PEIS Regulated Materials and Historic Mining Technical Report</i> (CDOT, March 2011), except the Excelsior Mine / Mill Site (milepost 200) and the Johnny Bull Mine (milepost 224.2). Acid rock / acid mine drainage (milepost 237 to milepost 239).
Rail with IMC	Yes	LUST sites in Corridor communities	Possible effects from disturbance of placer mines along Clear Creek. Potential unknown / uncharacterized mine waste materials in Clear Creek County.	Possible effects from acid rock / acid mine drainage due to tunnel construction and rock cuts in Clear Creek County. Specific areas of concern include milepost 223 to milepost 228 and milepost 233 to milepost 245.	All mine waste material areas listed in Table 6 of the <i>I-70 Mountain Corridor PEIS Regulated Materials and Historic Mining Technical Report</i> (CDOT, March 2011). Acid rock / acid mine drainage (milepost 237 to milepost 239).
AGS	Yes	LUST sites in Corridor communities	Possible effects from disturbance of placer mines along Clear Creek. Potential unknown / uncharacterized mine waste materials in Clear Creek County.	Possible effects from acid rock / acid mine drainage due to tunnel construction and rock cuts in Clear Creek County. Specific areas of concern include milepost 223 to milepost 228 and milepost 233 to milepost 245.	All mine waste material areas listed in Table 6 of the <i>I-70 Mountain Corridor PEIS Regulated Materials and Historic Mining Technical Report</i> (CDOT, March 2011). Acid rock / acid mine drainage (milepost 237 to milepost 239).
Dual-Mode and Diesel Bus in Guideway	Yes	LUST sites in Corridor communities	Possible effects from disturbance of placer mines along Clear Creek. Potential unknown / uncharacterized mine waste materials in Clear Creek County.	Possible effects from acid rock / acid mine drainage due to tunnel construction and rock cuts in Clear Creek County. Specific areas of concern include milepost 223 to milepost 228 and milepost 233 to milepost 245.	All mine waste material areas listed in Table 6 of the <i>I-70 Mountain Corridor PEIS Regulated Materials and Historic Mining Technical Report</i> (CDOT, March 2011). Acid rock / acid mine drainage (milepost 237 to milepost 239).

### 3.6. Regulated Materials and Historic Mining

Alternative	Areas Likely to Be Encountered				
	Potential Direct Impacts (Potential to Encounter Regulated Materials or Historic Mine Waste)				Identified Direct Impacts
	Residual Spill Materials	LUST / UST Sites	Historic Mine Waste Materials	Acid Rock / Acid Mine Drainage	Impact Areas
Six-Lane Highway (55 and 65 mph)	Yes	LUST sites in Corridor communities	Possible effects from disturbance of placer mines along Clear Creek. Potential unknown / uncharacterized mine waste materials in Clear Creek County.	Possible effects from acid rock/acid mine drainage due to tunnel construction and rock cuts in Clear Creek County. Specific areas of concern include mileposts 223 to 228 and mileposts 233 to 245.	All mine waste material areas listed in Table 6 of the <i>I-70 Mountain Corridor PEIS Regulated Materials and Historic Mining Technical Report</i> (CDOT, March 2011), except the Excelsior Mine / Mill Site (milepost 200). Acid rock / acid mine drainage (milepost 237 to milepost 239).
Reversible/HOV/HOT Lanes	Yes	LUST sites in Corridor communities	Possible effects from disturbance of placer mines along Clear Creek. Potential unknown / uncharacterized mine waste materials in Clear Creek County.	Possible effects from acid rock / acid mine drainage due to tunnel construction and rock cuts in Clear Creek County. Specific areas of concern include mileposts 223 to 228 and mileposts 233 to 245.	All mine waste material areas listed in Table 6 of the <i>I-70 Mountain Corridor PEIS Regulated Materials and Historic Mining Technical Report</i> (CDOT, March 2011), except the Excelsior Mine / Mill Site (milepost 200). Acid rock / acid mine drainage (milepost 237 to milepost 239).
Combination Six-Lane Highway with Rail and IMC	Yes	LUST sites in Corridor communities	Possible effects from disturbance of placer mines along Clear Creek. Potential unknown / uncharacterized mine waste materials in Clear Creek County.	Possible effects from acid rock / acid mine drainage due to tunnel construction and rock cuts in Clear Creek County. Specific areas of concern include milepost 223 to milepost 228 and milepost 233 to milepost 245.	All mine waste material areas listed in Table 6 of the <i>I-70 Mountain Corridor PEIS Regulated Materials and Historic Mining Technical Report</i> (CDOT, March 2011). Acid rock / acid mine drainage (milepost 237 to milepost 239).
Combination Six-Lane Highway with AGS	Yes	LUST sites in Corridor communities	Possible effects from disturbance of placer mines along Clear Creek. Potential unknown / uncharacterized mine waste materials in Clear Creek County.	Possible effects from acid rock / acid mine drainage due to tunnel construction and rock cuts in Clear Creek County. Specific areas of concern include milepost 223 to milepost 228 and milepost 233 to milepost 245.	All mine waste material areas listed in Table 6 of the <i>I-70 Mountain Corridor PEIS Regulated Materials and Historic Mining Technical Report</i> (CDOT, March 2011). Acid rock / acid mine drainage (milepost 237 to milepost 239).

### 3.6. Regulated Materials and Historic Mining

Alternative	Areas Likely to Be Encountered				
	Potential Direct Impacts (Potential to Encounter Regulated Materials or Historic Mine Waste)				Identified Direct Impacts
	Residual Spill Materials	LUST / UST Sites	Historic Mine Waste Materials	Acid Rock / Acid Mine Drainage	Impact Areas
Combination Six-Lane Highway with Dual-Mode and Diesel Bus in Guideway	Yes	LUST sites in Corridor communities	Possible effects from disturbance of placer mines along Clear Creek. Potential unknown / uncharacterized mine waste materials in Clear Creek County.	Possible effects from acid rock / acid mine drainage due to tunnel construction and rock cuts in Clear Creek County. Specific areas of concern include milepost 223 to milepost 228 and milepost 233 to milepost 245.	All mine waste material areas listed in Table 6 of the <i>I-70 Mountain Corridor PEIS Regulated Materials and Historic Mining Technical Report</i> (CDOT, March 2011). Acid rock / acid mine drainage (milepost 237 to milepost 239).
Preferred Alternative – Minimum Program*	Yes	LUST sites in Corridor communities	Possible effects from disturbance of placer mines along Clear Creek. Potential unknown / uncharacterized mine waste materials in Clear Creek County.  However, no widening from milepost 223 to milepost 242 where the majority of the mill sites and historic mining sites are located.	Possible acid rock / acid mine drainage from tunnel enhancements and rock cuts in Clear Creek County. Specific areas of concern include milepost 223 to milepost 228 and milepost 233 to milepost 245.  However, no widening from milepost 223 to milepost 242 where the majority of the mill sites and historic mining sites are located.	All mine waste material areas listed in Table 6 of the <i>I-70 Mountain Corridor PEIS Regulated Materials and Historic Mining Technical Report</i> (CDOT, March 2011), except the sites located between milepost 200 to milepost 235.7. Acid rock / acid mine drainage (milepost 237 to milepost 239).
Preferred Alternative – Maximum Program*	Yes	LUST sites in Corridor communities	Possible effects from disturbance of placer mines along Clear Creek. Potential unknown / uncharacterized mine waste materials in Clear Creek County.	Possible acid rock / acid mine drainage from tunnel enhancements and rock cuts in Clear Creek County. Specific areas of concern include milepost 223 to milepost 228 and milepost 233 to milepost 245.	All mine waste material areas listed in Table 6 of the <i>I-70 Mountain Corridor PEIS Regulated Materials and Historic Mining Technical Report</i> (CDOT, March 2011), except the Excelsior Mine / Mill Site (milepost 200). Acid rock / acid mine drainage (milepost 237 to milepost 239).

\*The adaptive management approach of the Preferred Alternative allows the project components and mitigations to be phased or adapted in implementation, which could result in impacts that differ from those presented here. Impacts will be refined and differences will be evaluated during Tier 2 processes.

#### Key to Abbreviations/Acronyms

AGS = Advanced Guideway System  
 HOV = high-occupancy vehicle  
 mph = miles per hour

CDOT = Colorado Department of Transportation  
 IMC = Intermountain Connection  
 UST = Underground Storage Tank

HOT = high-occupancy toll  
 LUST = Leaking Underground Storage Tank

### 3.6.6 What will be addressed in Tier 2 processes?

Before properties are acquired, Phase I Environmental Site Assessments will be conducted in accordance with the American Society for Testing and Materials E1527-05 standard practice. Detailed information will be collected about possible contamination from all known or suspected sites to determine actual direct impacts on these sites as a result of the Action Alternatives. Further assessments will be conducted of mine mills, mine waste dumps, Clear Creek/Central City Superfund sites, and areas of intense metal veining, including environmental conditions along Colorado Boulevard in Clear Creek County, where previous Initial Site Assessments identified mining activities and potential groundwater plumes.

The following activities will be done during Tier 2 processes:

- Involve stakeholders in the discussion of mine waste and regulated materials mitigation and develop specific mitigations and best management practices for each project.
- Consider alignments that avoid hazardous materials.
- Conduct a thorough analysis of the potential disturbance of acid mine drainage and acid rock drainage and recommend construction methods and best management practices in areas of mineralized rock.
- Provide a comprehensive listing and description of current regulations for regulated materials, including regulatory requirements for superfund and historic mining materials.
- Look at road construction as a source of metal loading from disturbance of mineralize veins in further detail and provide mitigation strategies to minimize or reduce metal loads from road construction.
- Provide procedures on identifying, characterizing, and handling waste in the study area. Information on contacting local authorities will also be provided in the event waste is encountered.
- Update information on regulated materials and historic mining.

### 3.6.7 What are the approaches to programmatic mitigation planning for regulated materials and historic mining sites?

The Colorado Department of Transportation will take the following steps to minimize and avoid potential environmental impacts resulting from regulated materials and historic mine waste. See also **Section 3.19** of this document.

- Minimize property acquisition and disturbance of mine wastes, tailings, and drainage tunnels and areas adjacent to or within active/inactive leaking underground storage tank sites.
- Minimize impacts on Clear Creek channel and floodplain both during and after disturbance of mine waste, tailings, and drainage tunnels.
- Manage mine waste and tailings materials onsite, when possible, to minimize potential disposal problems and costs.
- Minimize wind-blown dust from mine tailings on construction sites by wetting or other appropriate dust control measures. If dust control occurs near surface waters, ensure that proper stormwater management best management practices are in place to protect surface waters from runoff if water is applied excessively for dust control.
- Manage mine waste and tailings materials under Colorado Department of Public Health and Environment and Environmental Protection Agency guidance and authority.

### 3.6. Regulated Materials and Historic Mining

- Manage contaminated soil and groundwater under applicable Colorado Department of Public Health and Environment, Division of Oil and Public Safety, Environmental Protection Agency, and CDOT regulations and guidance.
- Follow CDOT procedures and other applicable guidance for the storage and handling of regulated materials and historic mine waste during construction activities.
- Work cooperatively with various local, state, and federal agencies and local watershed groups to avoid further impacts on and possibly improve water quality.
- Develop a monitoring and sampling program, as necessary, to monitor contamination, with consideration of the mining history in the Corridor. Previous studies have identified the need to monitor and sample eight metals regulated under the Resource Conservation and Recovery Act due to extensive historic mining in the Corridor.
- Any soil removed during trenching or augering will be conducted in accordance with specified health and safety regulations concerning the handling of soils with heavy metal content.

#### Leaking Underground Storage Tank Sites

Disturbance of identified leaking underground storage tank sites will require coordination with Division of Oil and Public Safety to ensure proper handling and disposal of contaminated materials (also see CDOT requirements and best management practices below). Construction activities associated with the alternatives may also uncover petroleum contamination from identified leaking underground storage tank sites or from leaking underground storage tank site contamination that was not indicated by research activities (or during subsequent research). Should contamination be discovered, construction activities will be temporarily halted until characterization/storage/disposal/cleanup requirements can be discussed with the Division of Oil and Public Safety or a professional familiar with Division of Oil and Public Safety procedures and requirements. Non-petroleum contaminants might also be encountered and will be handled under Colorado Department of Public Health and Environment Solid Waste or Resource Conservation and Recovery Act Hazardous Materials regulations and requirements, and Environmental Protection Agency toxic substances requirements if applicable.

#### Underground Storage Tank Sites

Underground storage tanks from existing and historic service stations might also be encountered. Underground storage tanks must be removed according to Division of Oil and Public Safety requirements during excavation/construction activities for any of the alternatives where they are affected by the project footprint. Tank removal will include sampling and analysis of underlying soil and soil removal (if necessary) to meet Division of Oil and Public Safety designated standards.

#### Dewatering

Excavation and grading activities for all of the alternatives, especially those that will include tunnel construction, might encounter groundwater and require dewatering activities. Tunnel construction practices will include consolidation grouting to minimize inflow into the tunnel. However, dewatering activities will be required on the tunnel and at the waste disposal (spoil) areas. Permit acquisition (from Colorado Department of Public Health and Environment) for discharge of groundwater into nearby surface water will require water analyses, removal of specific contaminants to Colorado Department of Public Health and Environment and Environmental Protection Agency approved levels, and lowering of total suspended solids to acceptable levels. Groundwater treatment will be accomplished by filtration, air stripping for volatile compounds, or stage dewatering methods. A permit variance will be necessary for effluent parameter to meet discharge standards. Construction dewatering will require coordination with Colorado Department of Public Health and Environment to determine necessary treatment and handling of extracted water before final discharge/disposition.

### Acid Rock Drainage

Excavation of road cuts in areas of mineralized rock will have the potential to introduce conditions for the leaching of metals from these excavated materials. Potential areas of mineralized rock requiring excavation will be specifically identified during Tier 2 processes. Tier 2 mitigation plans will ensure that acid rock drainage will not affect Corridor water quality through the implementation of appropriate best management practices and appropriate disposition activities for these materials.

### Metal Highway Structures

Disturbance or replacement of highway structures such as painted guardrails, signs, or metal bridge components will require appropriate characterization and disposal according to Colorado Department of Public Health and Environment guidelines and requirements.

### CDOT Requirements and Best Management Practices

The Colorado Department of Transportation contractors are required to comply with Section 250, Environmental, Health and Safety Management of CDOT Standard Specifications, when applicable. The specifications provide guidelines and requirements for health and safety measures during construction, the investigation and testing of contaminated materials, and procedures to use if contamination is encountered during construction.

All petroleum products and other hazardous materials, such as fuel and solvents, used for Action Alternatives' construction purposes will be handled and stored per CDOT best management practices to prevent accidental spillage or other harm to the project area. If suspected hazardous or petroleum products were encountered during construction, samples of the material will be collected and analyzed for metals, hydrocarbons, organic chemicals (volatile or semivolatile organic compounds), and other parameters to determine what special handling and disposal requirements are appropriate. The telephone numbers for medical and emergency services will be maintained onsite. If any unplanned occurrence requires assistance, the site supervisor or designated person will contact the appropriate response team.

### Historic Mine Waste

The Colorado Department of Public Health and Environment and Environmental Protection Agency coordination will be required for the handling of mine waste materials, and specific Colorado Department of Public Health and Environment and Environmental Protection Agency approval will be required for construction disturbance of sites that are currently designated as National Priority List sites within the Clear Creek/Central City Superfund Area. Other Clear Creek historic mining sites that pose considerable threats to Clear Creek will also require specific regulatory actions under the Comprehensive Environmental Response, Compensation, and Liability Act. Regulatory authority for mine tailings and waste fall under various state and federal programs, depending on where the waste is located and its designation under the Comprehensive Environmental Response, Compensation, and Liability Act. The Colorado Department of Public Health and Environment will be the lead agency (working with Environmental Protection Agency) for regulatory actions at the Clear Creek/Central City Superfund Area, and Colorado Department of Public Health and Environment Solid Waste Division will have authority for mine tailings not covered by the Comprehensive Environmental Response, Compensation, and Liability Act.

In addition, the Federal Highway Administration (FHWA) encourages "participation in transportation projects that include the use and redevelopment of contaminated sites when appropriate." Alternative implementation might offer a means to clean up contaminants that might not otherwise be addressed by means of the FHWA 1998 Brownfields Economic Redevelopment Initiative. The initiative, administered by Environmental Protection Agency, provides assistance and incentives to agencies for the assessment, cleanup, and economic reuse of contaminated properties known as Brownfields.

### 3.6. Regulated Materials and Historic Mining

The Colorado Department of Transportation will attempt to avoid disturbance of mine waste wherever possible. If avoidance is not feasible, CDOT will characterize the mine materials and reuse the material onsite, if possible. Offsite disposal of mine waste materials will be the least desirable mitigation option. Long-term impacts will include the potential to release contaminants from disturbance of mine waste (or other contaminants encountered in soil or groundwater) during construction activities. Such impacts could be avoided with appropriate handling of materials and implementation of state-of-the-practice erosion and sediment control plans.

Although contaminant sampling and testing has not yet specifically been performed for mine waste materials within the alternative footprints, it is expected (based on previous studies) that much of these waste materials will have relatively low levels of contaminants and will not be within or from sites requiring specific Comprehensive Environmental Response, Compensation, and Liability Act remedial actions. Such materials are suitable for construction material uses, including backfill and landscaping. These materials will be stabilized and maintained during and after construction to minimize environmental impacts. In certain cases, highway improvements through proper handling and stabilization of these materials, will serve to enhance environmental conditions in the Corridor.