3.11 HAZARDOUS MATERIALS

3.11.1 Introduction to Analysis

This section provides information regarding known contaminated sites and general areas of potentially contaminated properties along the proposed North Metro corridor alignment and station locations. Properties of primary concern are those that could substantially affect the feasibility or overall cost of the project. Impacts can result from current or historic land uses or releases of hazardous substances (i.e., pesticides, VOCs, semivolatile organic compounds, and heavy metals) or petroleum products (gasoline, diesel fuel, and lubricants). The presence of these materials can cause project delays and increased costs, particularly if they are not identified prior to construction. Hazardous material contamination would be avoided where possible, and adequate protective measures taken before, during, and after construction. For potentially contaminated properties acquired for project development, due diligence should be completed to provide all available purchaser protection under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Brownfields Act, and state programs. The project study area for hazardous materials includes lands within 500 feet of the centerline of the alignment and within 1,000 feet of station boundaries.

3.11.1.1 Summary of Results

Hazardous material sites were identified along all of the alignments. Generally, the most heavily contaminated areas extend from DUS to the Commerce City area. Fewer sites are present north of 84th Avenue. More than 1,000 hazardous material sites were identified within the project study area. The more significant hazardous materials sites identified in the environmental records search included CERCLA sites, Resource Conservation and Recovery Act (RCRA) sites, Colorado Voluntary Cleanup Program (VCUP) sites, UST sites, leaking underground storage tank (LUST) sites, and above ground storage tank sites. Environmental hazards associated with the Suncor refinery would likely have the greatest impact on the A-3 alignment. The B alignments skirt the west side of the refinery and would likely have less contact with contaminated materials in that area. However, the B alignments are located near the slurry wall and groundwater-barrier system at the refinery. Special consideration in designing the B alignments would be required to avoid impact to these features.

It is likely that during the construction of the CRMF Fox North Site, hazardous materials would be encountered due to historical and current industrial land uses that may have used, handled, or disposed of hazardous materials. Any hazardous materials encountered during construction would be remediated. The operation of the CRMF would involve the use of many regulated hazardous materials. RTD operations are required to adhere to many regulations requiring the safe use and disposal of such materials.

The projects included in the No Action Alternative are not anticipated to have any impacts along the alignments. Under the Build Alternative, impacts would be the same with either DMU or EMU. For the entire corridor, direct impacts among the alignments vary somewhat with 87 to 112 high-ranked sites within 500 feet of the alignment, all but three of which are in the Southern Section. A total of 23 to 36 potential landfill sites occur within 500 feet of the alignments in the Southern Section, depending on the alternative. The Coliseum/Stock Show South Station and the Coliseum/Stock Show North Station options have a number of potentially hazardous conditions. The Coliseum/Stock Show North Station option has more USTs than the Coliseum/Stock Show South Station option. The two Commerce City Station options are

similar. Considerably fewer high-ranked sites occur within the less developed Northern Section (three within 500 feet), and only one of the station areas (the 124th Avenue Station) has any hazardous waste sites within 1,000 feet. Potential indirect impacts would be similar among alignment and station options with most of the potential in the Southern Section. Temporary construction impacts could occur if hazardous materials are encountered during construction resulting in potential human health hazards and costs to remove. These potential impacts would be similar among alignment and station options with the majority of the potential occurring in the Southern Section.

3.11.1.2 Relevant Law

The principal agency regulating the generation, use, storage, and disposal of hazardous materials is the USEPA, under the authority of RCRA. The USEPA regulates hazardous substance sites under CERCLA. Additional federal regulations include the Community Environmental Response Facilitation Act of 1992, CWA, CAA, Safe Drinking Water Act, Occupational Safety and Health Act, Atomic Energy Act, Toxic Substances Control Act, and the Federal Insecticide, Fungicide and Rodenticide Act. EO 12088 — Federal Compliance with Pollution Control, mandates that necessary actions be taken to prevent and control environmental pollution with respect to federal facilities and activities. At the state level, the CDPHE, Hazardous Materials and Waste Management Division, regulates hazardous materials. State laws and regulations include the Colorado Voluntary Clean-up and Redevelopment Act of 1994, and Section 5.5.1 (A) of the Colorado Solid Waste Regulations pertaining to asbestos in soil.

3.11.2 Affected Environment

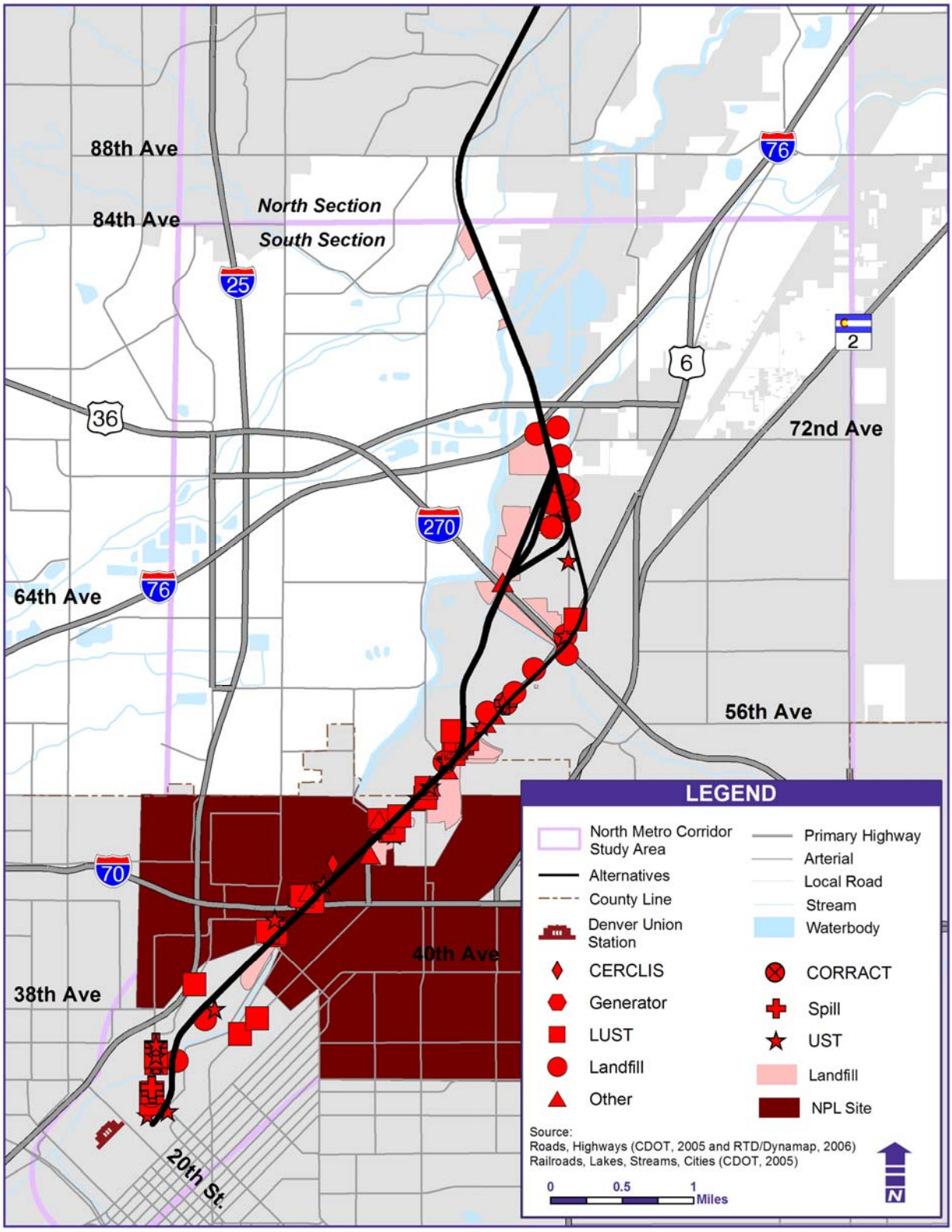
3.11.2.1 Southern Section — DUS Access to 84th Avenue

The neighborhoods adjacent to the alignments (A-3, B-2, B-3, and B-4) are primarily composed of commercial and industrial properties, with some residential areas. A total of 115 hazardous material sites were identified within 500 feet of the alignments from the DUS access area to 84th Avenue, and within 1,000 feet from the station options (see Figure 3.11-1). High-ranking sites within 500 feet and within 100 feet of the various alignments (A-3, B-2, B-3, and B-4) were also analyzed. The A-3 alignment has the greatest number of hazardous material sites in the Southern Section, with 109 sites identified within 500 feet of the alignment, and with 42 sites identified within 100 feet of the alignment. Hazardous material sites were identified near the B alignments, ranging from 84 to 94 high-ranked sites within 500 feet of each alignment, and 34 to 38 high-ranked sites within 100 feet of each alignment in the Southern Section. Sites were ranked based on the type of site and the distance from the alignment or station based on RTD criteria.

At the Suncor refinery property, contaminated soil and groundwater are present. Refinery-related contamination is present in the subsurface with hydrocarbon thicknesses approaching 3.5 feet. A hydrocarbon mitigation barrier is located north of the refinery, south of Sand Creek. In addition, a slurry wall to the west of the property is an important feature to accommodate for the design of the alternatives.

In addition to potential hazardous material sites identified, debris and other solid wastes were disposed in many areas north of I-270.

FIGURE 3.11-1. HAZARDOUS MATERIAL SITES — SOUTHERN SECTION



3.11.2.2 Northern Section — 84th Avenue to 162nd Avenue Area

The Northern Section extends from 84th Avenue to 162nd Avenue and includes the cities of Northglenn and Thornton (see Figure 3.11-2). The alignment traverses residential and commercial areas between 84th Avenue and 136th Avenue, with commercial development becoming less predominant and residential neighborhoods becoming more predominant to the north. Small pockets of agricultural land are present between 84th Avenue and 136th Avenue. The land is primarily agricultural north of 136th Avenue. Three high-ranked sites were identified within 500 feet of the alignment, and one high-ranked site was identified within 100 feet of the alignment in the Northern Section. In addition, three high-ranked sites were identified within 1,000 feet of the 124th Avenue Station; no high-ranked sites were identified near the other stations in the Northern Section.

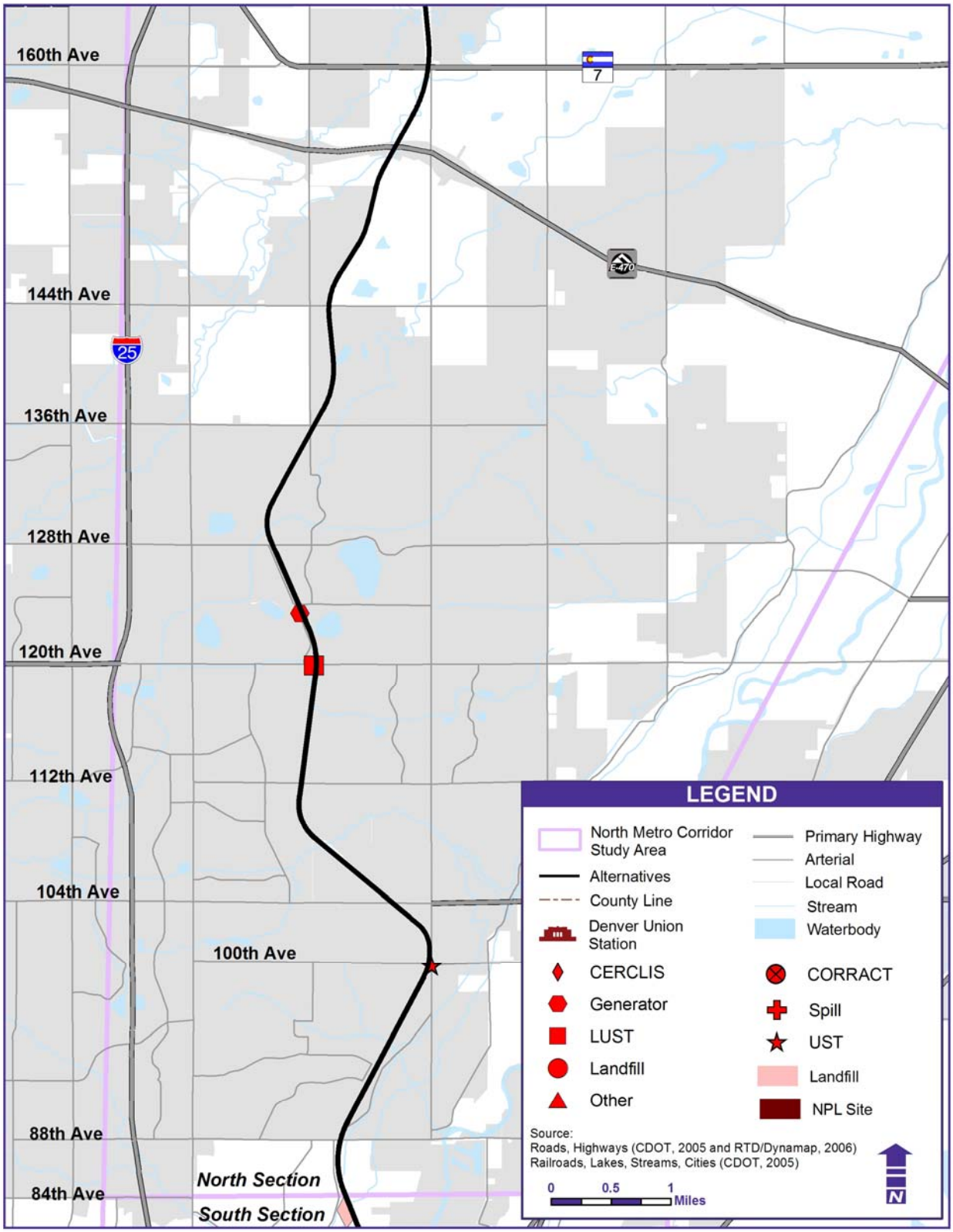
3.11.3 Impact Evaluation

This evaluation includes analysis of potential DMU and EMU vehicle technology impacts. When the technology impact is vehicle specific to this resource, it is described below in the Results subsection.

3.11.3.1 Methodology

Information contained in the *Hazardous Materials Technical Report FasTracks — North Metro Corridor* (LT Environmental 2006) and environmental records and database searches conducted along the project footprint in October 2006, were used to identify hazardous material sites. Field reconnaissance provided additional information. An environmental database search was conducted using American Society for Testing and Materials (ASTM) Standard E 1527-05 protocol and identified specific federal and state environmental sources and search distances (ASTM 2005). All potentially hazardous sites are reported within the project study area and direct impact area, which are the same size for hazardous materials. These direct impacts are sources of *potential* risk of contamination and cost. Proper mitigation measures, as described in Section 3.11.4, will be followed to properly identify, handle, and dispose of hazardous substances, so that the residual potential for adverse impacts such as environmental contamination or human health risk is low. Sites were ranked based on the type of site and the distance from the alignment or station based on RTD criteria. High-ranked sites are defined by RTD as sites that are within 500 feet of the alignment or 1,000 feet of station boundaries. High-ranked sites within 100 feet were further identified as having a higher potential for impacts. Additional assessment of each site was then conducted to determine the type and quantity of contaminant release distance from the alignment, direction of groundwater flow and pertinent file information about the specific release.

FIGURE 3.11-2. HAZARDOUS MATERIAL SITES — NORTHERN SECTION



3.11.3.2 Results

Table 3.11-1 summarizes the anticipated direct and indirect impacts associated with each of the alternatives, alignments, options, and stations. The projects included in the No Action Alternative are not anticipated to have any impacts within the project study area. Under the Build Alternative, impacts would be the same with either DMU or EMU. For the entire corridor, the A-3 alignment would have the greatest number of potential direct impacts (112 high-ranked sites), compared to the B alignments that would have 87 to 97 high-ranked sites within 500 feet of the alignment, all but three of which are in the Southern Section. The A-3 alignment traverses along Brighton Boulevard between the Suncor refinery properties where contaminated soil, groundwater, and hydrocarbon plumes up to 3.5 feet of thickness are present. The B alignments are also near the Suncor refinery and traverse along O'Brian Canal to the west of the refinery.

At Suncor, a groundwater-barrier system south of Sand Creek prevents migration of sub-surface contaminants to the north and west. The A-3 alignment avoids this feature. The B alignments are on structure within the vicinity of this feature. In addition to the groundwater-barrier system, there is another feature to the west of the refinery, slurry walls, to consider in designing the commuter rail system. The B alignments, which are on structure, traverse on the west side of Suncor along the O'Brian Canal (Burlington Ditch) and are in close proximity to this facility. The A-3 alignment is not near this feature.

Potential hazardous material sites are depicted on Figure 3.11-1 and Figure 3.11-2. The Coliseum/Stock Show South Station and the Coliseum/Stock Show North Station options have a number of potentially hazardous conditions. The Coliseum/Stock Show North Station option has more LUSTs and USTs than the Coliseum/Stock Show South Station option, and a Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) site within 1,000 feet. The two Commerce City Station options are similar. Considerably fewer potential impacts would occur within the less developed Northern Section (three sites), and only the 124th Avenue Station area has any potential hazardous waste sites. Potential indirect impacts would be similar among alignment and station options with most of the potential in the Southern Section. Temporary construction impacts could occur if hazardous materials are encountered during construction resulting in potential human health hazards and costs to remove. These potential impacts would be similar among alignment and station options with the majority of the potential occurring in the Southern Section.

TABLE 3.11-1. DIRECT AND INDIRECT IMPACTS SUMMARY — HAZARDOUS MATERIALS

Alternative/Alignment	Direct Impacts	Indirect Impacts
NO ACTION ALTERNATIVE *SOUTHERN SECTION AND NORTHERN SECTION*	• Although hazardous materials are present within the project study areas of some of the No Action Alternative projects, no adverse impacts are anticipated from implementing these projects.	• No indirect impacts are anticipated.

TABLE 3.11-1. DIRECT AND INDIRECT IMPACTS SUMMARY — HAZARDOUS MATERIALS

Alternative/Alignment	Direct Impacts		Indirect Impacts
BUILD ALTERNATIVE			
SOUTHERN SECTION — DUS Access to 84th Avenue			
Alignments			
A-3	• One-hundred-nine high-ranked sites within 500 feet of the alignment consisting of an NPL, USTs, LUSTs, CORRACTS, SQGs, landfill sites, and multiple spill sites. • Forty-two high-ranked sites within 100 feet of the alignment, consisting of an NPL site, USTs, LUSTs, CORRACTS, landfill sites, and multiple spill sites.		• Indirect impacts could include reduction in landfill capacity due to excavation and disposal of contaminated soils.
B-2	• Eighty-four high-ranked sites within 500 feet of the alignment consisting of an NPL, USTs, LUSTs, CORRACTS, SQGs, landfill sites, and spill sites. • Thirty-four high-ranked sites within 100 feet of the alignment consisting of NPL, USTs, LUSTs, landfills, and spill sites. • Within the vicinity of the slurry wall and hydrocarbon barrier at Suncor.		• Indirect impacts could include reduction in landfill capacity due to excavation and disposal of contaminated soils.
B-3	• Eighty-nine high-ranked sites within 500 feet of the alignment consisting of an NPL, USTs, LUSTs, CORRACTS, VCL, SQGs, landfill sites, and spill sites. • Thirty-six high-ranked sites within 100 feet of the alignment consisting of USTs, LUSTs, landfills, and spill sites. • Within the vicinity of the slurry wall and hydrocarbon barrier at Suncor.		• Indirect impacts could include reduction in landfill capacity due to excavation and disposal of contaminated soils.
B-4	• Ninety-four high-ranked sites within 500 feet of the alignment consisting of an NPL, CERCLIS, USTs, LUSTs, CORRACTS, SQGs, landfill sites, and spill sites. • Thirty-eight high-ranked sites within 100 feet of the alignment consisting of CERCLIS, USTs, LUSTs, landfills, SQGs, and spill sites. • Within the vicinity of the slurry wall and hydrocarbon barrier at Suncor.		• Indirect impacts could include reduction in landfill capacity due to excavation and disposal of contaminated soils.
Stations			
Station Target Area	**Station Option**		
Coliseum/Stock Show (Denver)	Coliseum/Stock Show South	Within 1,000 feet: • 1 UST. • 1 NPL. • 2 landfills. • 2 SQGs. • Acquired property for this station may have recognized environmental conditions.	• Indirect impacts could include reduction in landfill capacity due to excavation and disposal of contaminated soils.

TABLE 3.11-1. DIRECT AND INDIRECT IMPACTS SUMMARY — HAZARDOUS MATERIALS

Alternative/Alignment	Direct Impacts		Indirect Impacts
Coliseum/Stock Show (Denver) (continued)	Coliseum/Stock Show North	Within 1,000 feet: • 1 CERCLIS. • 7 LUSTs. • 1 NPL. • 11 USTs. • 1 SQG. • 1 landfill. • 3 other. • Acquired property for this station may have recognized environmental conditions.	• Indirect impacts could include reduction in landfill capacity due to excavation and disposal of contaminated soils.
Commerce City	68th Avenue	Within 1,000 feet: • Two former landfills near 72nd Avenue and Colorado Boulevard and near 68th Avenue and Colorado Boulevard. • UST sites. • Acquired properties for the 68th Avenue Station may have recognized environmental conditions.	• Indirect impacts could include reduction in landfill capacity due to excavation and disposal of contaminated soils.
	72nd Avenue South	Within 1,000 feet: • Two former landfills near 72nd Avenue and Colorado Boulevard and near 68th Avenue and Colorado Boulevard. • UST sites. • Acquired properties for this station may have recognized environmental conditions.	• Indirect impacts could include reduction in landfill capacity due to excavation and disposal of contaminated soils.
NORTHERN SECTION— 84th Avenue to 162nd Avenue Area			
Alignment		• Three high-ranked sites within 500 feet of the alignment that include 1 UST, 1 LUST, and 1 SQG. • One high-ranked site within 100 feet of the alignment that includes 1 UST and 1 SQG.	• Indirect impacts could include reduction in landfill capacity due to excavation and disposal of contaminated soils.

TABLE 3.11-1. DIRECT AND INDIRECT IMPACTS SUMMARY — HAZARDOUS MATERIALS

Alternative/Alignment	Direct Impacts		Indirect Impacts
Stations			
Station Target Area	**Station Option**		
88th Avenue (Thornton)	88th Avenue	• No direct impacts from hazardous materials are expected. No sites are present within 1,000 feet of the station footprint.	• No indirect impacts from hazardous materials are expected.
	88th Avenue Welby Road Relocation	• No direct impacts from hazardous materials are expected. No sites are present within 1,000 feet of the station footprint.	• No indirect impacts from hazardous materials are expected.
104th Avenue (Thornton)	104th Avenue	• No direct impacts from hazardous materials are expected. No sites are present within 1,000 feet of the station footprint.	• No indirect impacts from hazardous materials are expected.
112th Avenue (Northglenn/ Thornton)	112th Avenue Parking West of York Street	• No direct impacts from hazardous materials are expected. No sites are present within 1,000 feet of the station footprint.	• No indirect impacts from hazardous materials are expected.
	112th Avenue Parking East of York Street	• No direct impacts from hazardous materials are expected. No sites are present within 1,000 feet of the station footprint.	• No indirect impacts from hazardous materials are expected.
124th Avenue (Thornton)	124th Avenue	• Three sites (two SQGs and one field observation) within 1,000 feet of the station footprint).	• Indirect impacts could include reduction in landfill capacity due to excavation and disposal of contaminated soils.
144th Avenue (Thornton)	144th Avenue West	• No direct impacts from hazardous materials are expected.	• No indirect impacts from hazardous materials are expected.
	144th Avenue East	• No direct impacts from hazardous materials are expected.	• No indirect impacts from hazardous materials are expected.
	144th Avenue Split	• No direct impacts from hazardous materials are expected.	• No indirect impacts from hazardous materials are expected.

TABLE 3.11-1. DIRECT AND INDIRECT IMPACTS SUMMARY — HAZARDOUS MATERIALS

Alternative/Alignment	Direct Impacts		Indirect Impacts
162nd Avenue (Thornton)	162nd Avenue West	• No direct impacts from hazardous materials are expected.	• No indirect impacts from hazardous materials are expected.
	162nd Avenue East	• No direct impacts from hazardous materials are expected.	• No indirect impacts from hazardous materials are expected.

Source: Satisfi Database, 2006; National Fire Academy/OPS, 2007.

Notes:

CERCLIS	=	Comprehensive Environmental Response, Compensation, and Liability Information System
CORRACTS	=	Corrective Action Site
DUS	=	Denver Union Station
LUST	=	leaking underground storage tank
NPL	=	National Priorities List
SQG	=	small quantity generator
Suncor	=	Suncor Energy (U.S.A.) Inc.
UST	=	underground storage tank
VCL	=	Voluntary Cleanup

No Action Alternative

Direct Impacts

Hazardous material locations exist within the vicinity of roadway and FasTracks projects proposed under the No Action Alternative within the North Metro corridor study area. Road widening would occur on 128th Avenue between I-25 and York Street, on 144th Avenue between Washington Street and Colorado Boulevard, and along SH 7 between I-25 and US 85. However, no direct adverse impacts are anticipated from their presence. No direct impacts would result from hazardous materials in the No Action Alternative roadway, transit, or pedestrian/bicycle improvements along any of the alignments.

Indirect Impacts

No indirect impacts are anticipated from hazardous materials from construction of the No Action Alternative projects along any of the alignments.

Temporary Construction Impacts

No temporary construction impacts are anticipated from hazardous materials under the No Action Alternative along any of the alignments.

Cumulative Impacts

Cumulative impacts include all impacts from past, present, and future projects on a particular resource. For hazardous materials, this includes historic contamination that was released prior to the development of environmental regulations, and existing and future contamination that is or could be released due to accidents or negligence and in spite of existing regulations. By developing mitigation measures and hazardous material management plans, and by following established procedures, no releases from hazardous material sites would be likely to occur. Therefore, no cumulative impacts would result from hazardous materials in the No Action Alternative along any of the alignments.

Build Alternative

Direct Impacts

Southern Section — DUS Access to 84th Avenue

Potential direct impacts resulting from alignments A-3, B-2, B-3, and B-4, and station options in the Southern Section are described in Table 3.11-1 and shown on Figure 3.11-1. The A-3 alignment has the greatest number of high-ranked sites within 500 feet of the alignment (109). The A-3 alignment also traverses between the Suncor refinery properties where soil and groundwater contamination are present. The A-3 alignment does not impact the Suncor hydrocarbon barrier or slurry walls. A total of 36 potential landfill sites occur within 500 feet of the A-3 alignment.

Potential direct impacts among alignments B-2, B-3, and B-4 include 84, 89, and 94 high-ranked sites within 500 feet of the alignments, respectively. The B alignments are within the vicinity of the Suncor hydrocarbon barrier and the slurry wall; however, they are on bridge structure in these locations. A total of 23 to 29 potential landfill sites occur within 500 feet of all the B alignments. The Coliseum/Stock Show North Station and the Coliseum/Stock Show South Station options have a number of potentially hazardous conditions. The Coliseum/Stock Show North Station option has more USTs and LUSTs than the Coliseum/Stock Show South Station option. The two Commerce City Station options are similar.

Northern Section — 84th Avenue to 162nd Avenue Area

Direct impacts resulting from the alignment and station options in the Northern Section are described in Table 3.11-1 and shown on Figure 3.11-2. The number of high-ranked sites along the Northern Section Alignment (three sites) is considerably less than in the Southern Section. Only the 124th Avenue Station area has any high-ranked sites within 1,000 feet.

Indirect Impacts

Due to the presence of contaminated materials in the Northern Section project study area, excavation and removal of contaminated material may be required during construction, as described above in Direct Impacts. If such excavation were needed, the material would be transported off site for treatment or disposal at a landfill. Indirect impacts could include reduction in landfill capacity due to excavation and disposal of contaminated soils. In addition, indirect impacts associated with transporting hazardous materials could result. These indirect impacts would be similar among the alignment and station options within the Southern Section and Northern Section. There would generally be more indirect impacts in the Southern Section than in the Northern Section because there is the potential for more excavation and more areas of contaminated soil.

Temporary Construction Impacts

Construction impacts associated with the Build Alternative can result in health and safety concerns during construction if hazardous materials are encountered. Costs associated with contaminated soil removal and disposal could be significant. If contaminated groundwater is encountered, treatment may be required during excavation and construction. There would generally be more temporary construction impacts in the Southern Section than the Northern Section because there is the potential for more excavation and more areas of contaminated soil.

Connected Action – CRMF Fox North Site

According to the *Commuter Rail Maintenance Facility Supplemental Environmental Assessment to FasTracks Commuter Rail Corridors* (FTA and RTD 2009), it is possible that during the construction of the CRMF, hazardous materials would be encountered due to the historical and

current industrial land uses that may have used, handled, or disposed of hazardous materials. Any hazardous materials encountered during construction would be remediated.

The operation of the CRMF would involve the use of regulated hazardous materials. RTD's operations are required to adhere to many regulations requiring the safe use and disposal of such materials. Adherence to these regulations will mitigate potential impacts to human health and the environment.

Cumulative Impacts
Other actions in the area may also involve excavation of contaminated materials. If proper controls and methods for handling and disposal of contaminated materials are employed on this project and other projects, no substantial cumulative impacts are likely to occur.

3.11.4 Mitigation

Mitigation of impacts would consist of modifying design elements and construction activities to avoid conflict with subsurface contamination. Opportunities to avoid and minimize impacts associated with hazardous material sites will be identified during final design. These will include, but not be limited to, modifications to the location of the track, and avoidance of excavation in areas such as the groundwater barrier in the Suncor refinery and near landfills or contaminated soils identified beneath or adjacent to the alignment. Coordination with regulatory agencies will be conducted prior to site-specific data review. An update of the hazardous materials database should be performed prior to property acquisition, final design, and construction to identify any new sites or changes in existing conditions. Property acquisition will result in a site-specific investigation that may consist of a preliminary type assessment, a Phase I investigation, or a more complex Phase II type investigation. The type of investigation selected would depend on site-specific conditions and the availability of existing soil and groundwater quality data. A Phase II investigation that includes field sampling and laboratory analysis will be undertaken at sites where existing soil and groundwater contamination may affect the project design. Areas adjacent to hazardous material sites where construction activities, excavation, and property acquisition occur, will also be evaluated for possible migration of existing contamination. For moderate-ranked sites, additional information from regulatory agencies and landowners will be obtained to further evaluate the potential for impact.

A materials handling plan will be developed to properly handle and dispose of contaminated materials generated during the project. A material abatement plan will be developed for asbestos and lead-based paint in any identified or acquired structures. A stormwater pollution prevention plan will be developed and monitoring of stormwater quality performed prior to discharge from the alignment or station target areas.

Because sections of the project are located in highly industrialized areas, contaminated soil and groundwater are likely to be encountered. Soils beneath and adjacent to the track itself may be contaminated from historic and current rail use. It may not be practicable to avoid all areas of contamination along the alignment, although during final design some accommodations may be made for highly contaminated areas. Where grade separation or other excavations occur, environmental sampling of affected media will be necessary. Unknowingly encountering contaminated sites can affect the project in terms of cost and schedule as well as agency and public relations. Acquisition of properties with contaminated soil and/or groundwater can lead to liability concerns related to the remediation of those properties. Long-term cleanup and remediation systems can add costs to the project.

It is anticipated that soil and groundwater in the refinery area will be contaminated with petroleum hydrocarbons. In addition, debris and other solid wastes were disposed in many areas north of I-270. These landfill sites are poorly delineated in National Fire Academy files, and locations are often imprecise.

Construction in these areas will require hazardous waste and solid waste management. A materials handling plan to deal with contaminated materials and a health and safety plan will be used throughout the project footprint. Acquisition of any properties or easements could also necessitate the following:

- Site investigation where drilling and sampling established environmental conditions of a particular area or property
- Remedial investigation/feasibility study where the magnitude of contamination on a property is established and mitigation and cleanup remedies are devised

Engineering controls to minimize the amount of contaminated materials requiring long-term maintenance will be addressed in the final design. Responsibility for designing, building, and operating any remediation systems and cost recovery must be established.

With the exception of the Northern Section, all of the alignments are located in areas with long histories of industrial and commercial uses. Areas of known soil and groundwater contamination are present in industrial areas and include:

- Suncor refinery, where special care will need to be taken with the existing contamination and the slurry wall and groundwater barrier system present along the west side of the refinery and on the south side of Sand Creek
- Commerce City area, especially north of I-270, due to the many historic landfills where actual locations are no longer certain
- Commerce City Station area, aggregate industries operated by Albert R. Frei, LLP

Other sites described along the alignment and in or adjacent to station target areas may also have impacted soil and groundwater. Table 3.11-2 presents proposed mitigation measures.

TABLE 3.11-2. PROPOSED MITIGATION MEASURES — HAZARDOUS MATERIALS

Impact	Impact Type	Mitigation Measures
Contaminated Soil and/or Groundwater	Construction (Temporary) Operations (Permanent)	• A site investigation plan for sampling and analysis will be developed where excavation or property acquisition occurs. • A materials handling plan will be developed to address contaminated soil and groundwater. • Engineering controls will be determined to minimize quantity of contaminated materials. • Responsible parties will be determined for design, build, and operation of remediation systems. • Cost recovery of hazardous material sites where removal actions and long-term maintenance is required will be determined. • A heavy-metal-based paint survey will be prepared of bridges in the project study area. • An asbestos survey will be prepared in the event of building and structure acquisition or demolition, or if asbestos is known to be present. • Soil characterization and management plans will be prepared according to National Fire Academy HMWMD if construction debris is encountered during activities and is suspected to contain asbestos.

Source: North Metro Corridor Project Team, 2007.

Note:

HMWMD = Hazardous Materials and Waste Management Division