



# **Modified Phase I Environmental Site Assessment for the North Meadows Extension to US 85 and Interstate 25**

**February 2010**

**Prepared for:**

Town of Castle Rock  
Douglas County  
Colorado Department of Transportation  
Federal Highway Administration

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## APPENDIX

### APPENDIX A *EDR DATABASE REPORT*



## LIST OF ACRONYMS

AST	above ground storage tank
ASTM	American Society for Testing and Materials
ATSF	Atchison Topeka & Santa Fe Railway
bgs	below ground surface
BNSF	Burlington Northern Santa Fe Railway
CAPS	Colorado Aerial Photo Service
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
CORRACTS	RCRA Corrective Action
DEIS	Draft Environmental Impact Statement
D&RG	Denver & Rio Grande Railroad
D&SF	Denver & Santa Fe Railway
EA	Environmental Assessment
EDR	Environmental Data Resources, Inc.
EIS	Environmental Impact Statement
EPB	CDOT Environmental Programs Branch
ERNS	Emergency Response Notification System
FHWA	Federal Highway Administration
FHU	Felsburg Holt & Ullevig
FINDS	facility index system
ft	feet
gpm	gallons per minute
I-25	Interstate 25
LF	landfill
LUST	leaking underground storage tank
MESA	Modified Phase I Environmental Site Assessment
MMP	materials management plan



NEPA	National Environmental Policy Act
NFRAP	no further remedial action planned
NPL	National Priority List
OPS	Colorado Department of Labor and Employment Division of Oil and Public Safety
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
RCRIS	Resource Conservation and Recovery Information System
SWF	solid waste facility
TSD	RCRA treat, storage, or disposal facility
UPRR	Union Pacific Railroad
US 85	US Highway 85
USACE	US Army Corps of Engineers
USEPA	US Environmental Protection Agency
USFWS	US Department of Interior Fish and Wildlife Service
USGS	US Department of Interior Geological Survey
UST	underground storage tank
VCP	CDPHE voluntary clean-up program



## 1.0 INTRODUCTION

The National Environmental Policy Act (NEPA) of 1969 established a mandate for federal agencies to consider the potential environmental consequences of their proposed actions, to document the analysis, and to make the information available to the public for comment prior to implementation. In accordance with NEPA and related regulations, the Federal Highway Administration (FHWA), as the Lead Agency, in cooperation with the Colorado Department of Transportation (CDOT) as a Joint Lead Agency, has prepared this Environmental Assessment (EA) for a proposed extension of North Meadows Drive from The Meadows area to US Highway 85 (US 85) and to Interstate 25 (I-25) in Douglas County, Colorado. The proposed North Meadows Extension would cross the Burlington Northern Santa Fe (BNSF) Railway, East Plum Creek, and the Union Pacific Railroad (UPRR) (**Figure 1 Study Area**). The project is sponsored by the Town of Castle Rock and Douglas County. The US Department of the Interior Fish and Wildlife Service (USFWS) is a Cooperating Agency.

### 1.1 Purpose

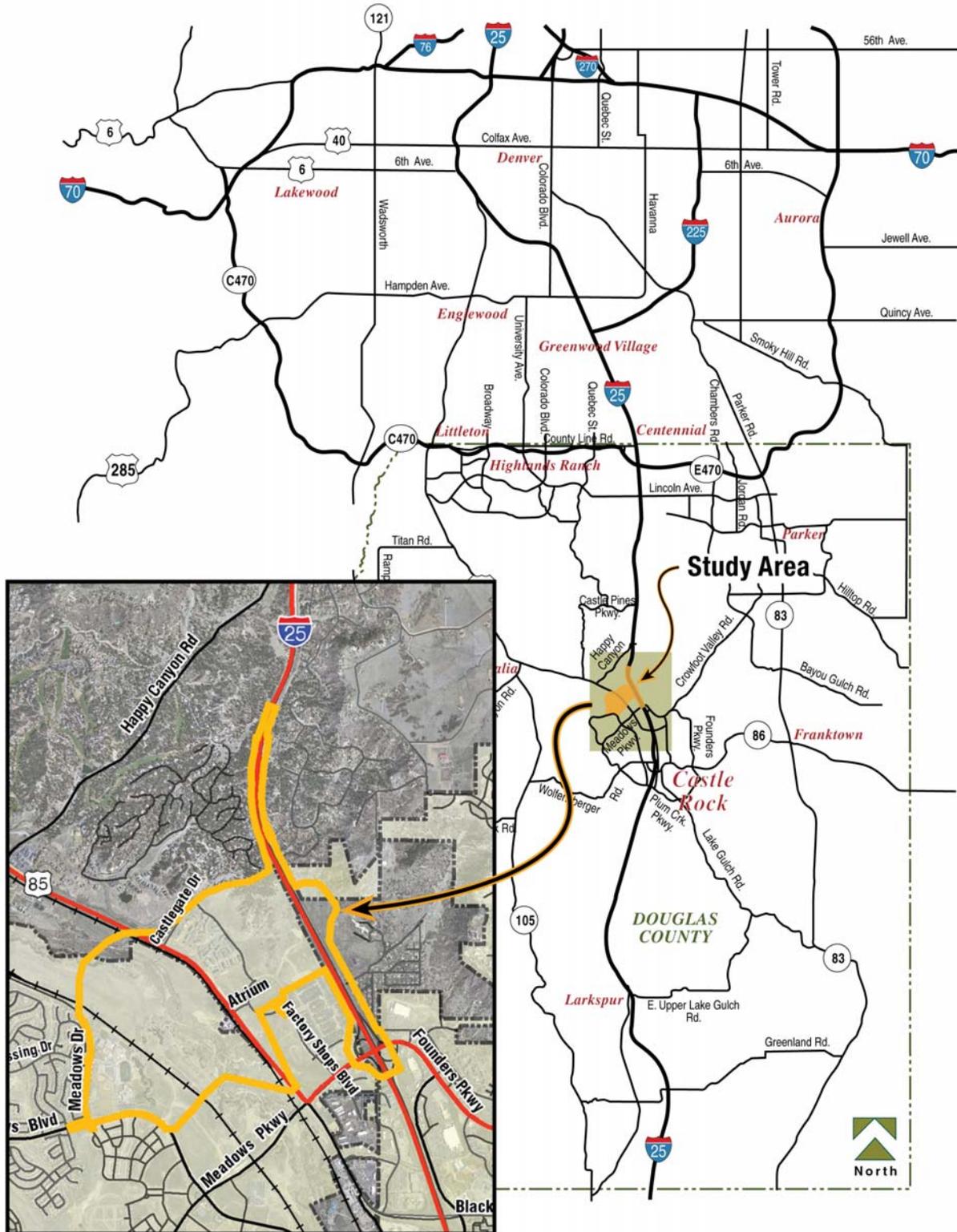
The objective of this Modified Phase I Environmental Site Assessment (MESA) is to provide information needed for planning efforts related to properties (sites) within the study area that pose a potential risk of environmental contamination from hazardous materials. A thorough assessment and investigation of properties within the study area for past or present soils and/or groundwater contamination is an integral component of the planning process. These planning efforts include right-of-way acquisition costs and property appraisals, the options for owner funded site remediation prior to acquisition, property avoidance, and planning for engineering options to minimize the necessary remediation and treatment of residual hazardous materials.

Due to their contaminated nature, hazardous materials require specific materials management, handling, worker health and safety, and disposal practices. In the case that contamination of soils and/or groundwater is suspected, avoidance or mitigation measures can be implemented when reasonably possible. Encountering soil and groundwater contamination during the construction process without prior knowledge of contamination has the potential to affect the project in terms of mitigation, cost, schedule, and project personnel health and safety issues.

The level of detail in this MESA is appropriate for the development, screening, and advancement of Refined Alternatives 6 and 7. In certain cases, potential or historic recognized environmental conditions may be present but could not be confirmed without additional inspection or investigation, which is beyond the scope of this MESA.

Accordingly, it is anticipated that additional assessment and/or field investigations may be required in support of project design, right-of-way acquisition, and the development of specific materials management or institutional controls required during construction. Recommendations pertaining to additional assessment and investigation are provided in **Section 6.0 Findings and Recommendations**.

Figure 1 Study Area





## 1.2 Methodology

A methodology was prepared for this MESA in general accordance with American Society for Testing and Materials (ASTM) E 1527-05, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (ASTM 2005), US Environmental Protection Agency (USEPA) Standards and Practices for All Appropriate Inquiries [40 Code of Federal Regulations (CFR) Part 312], and CDOT hazardous materials guidance [CDOT Environmental Programs Branch (EPB) 2005]. Modifications to the ASTM methodology are presented in **Section 1.3 Guidance Modifications and Limitations**.

The methodology to assess the presence of sites with recognized environmental conditions or potential environmental conditions within the study area included the following steps:

- Step 1:** Performance of a limited site reconnaissance, “windshield survey,” to identify site activities with potential soil or groundwater contamination concerns (**Chapter 3.0 Site Reconnaissance**);
- Step 2:** Review of readily available documents, such as aerial photographs, that identify historical uses of the sites within the study area (**Chapter 4.0 Historical Use Information**);
- Step 3:** Review of readily available local, state, and federal environmental agency databases within the study area from 0.125 mile to 1.0 mile from the Castlegate Drive West/Atrium Drive intersection as dictated by the ASTM Standard E1527-05 (**Chapter 5.0 Agency Records and Previous Investigations Review**);
- Step 4:** Review of previous CDOT investigations, Colorado Department of Public Health and Environment (CDPHE) records, Colorado Department of Labor and Employment Division of Oil and Public Safety (OPS) records, and other available records from local, state, and federal agency records for sites within the study area (**Chapter 5.0 Agency Records and Previous Investigations Review**); and
- Step 5:** Identification of sites requiring additional evaluation or investigation to assist in right-of-way acquisition, project design, and specific-materials management or institutional controls required during construction (**Chapter 6.0 Findings and Recommendations**).

## 1.3 Guidance Modifications and Limitations

This MESA report was prepared for FHWA, CDOT, Douglas County, and the Town of Castle Rock for their sole use and reliance. Reliance on this report by any other person(s) or entity(ies) is strictly at their own risk, and Felsburg Holt & Ullevig (FHU) makes no warranties to person(s) or entity(ies) other than FHWA, CDOT, Douglas County, and the Town of Castle Rock who use the information provided in this report. If any other person(s) or entity(ies) wish to rely on this report, FHU will require that such parties agree to our contract terms in writing.

FHU performed this work for the sole purpose of assisting in the evaluation of potential and recognized environmental conditions associated with Refined Alternatives 6 and 7. The scope of work commissioned for this project does not represent an exhaustive study, but rather a reasonable inquiry, consistent with good commercial practice, in general accordance with the ASTM standard for Phase I Environmental Site Assessments. The ASTM E 1527-05 standard “...is intended to permit a user to satisfy one of the requirements to qualify for the innocent landowner defense to Comprehensive Environmental Response Compensation and Liability Act (CERCLA) liability.”



FHU's assessment and findings presented herein are based upon observation of current study area conditions and a review of reasonably ascertainable standard record resources. This assessment did not attempt to detect the presence of environmental contamination that may exist in areas that could not be visually inspected. Sampling of soils, groundwater, and/or surface waters was beyond the scope of this MESA. Our assessment was limited to areas accessible along the public right-of-way entry and did not include access to fenced-in areas, interior of buildings, rear lots (alley side portion of each site), or areas not visible from public right-of-way in the study area. Access was provided to the undeveloped Castle Rock Development Company property between US 85 and The Meadows. Interviewing property owners and/or tenants was also beyond the scope of this MESA. Other environmental liabilities to a property owner, such as the presence of asbestos-containing materials, radon, or lead-based paint were also beyond the scope of investigation for this MESA. The presence or absence of such conditions cannot be confirmed without additional investigation. Recommendations for additional investigation are discussed in **Section 6.2 Recommendations** of this report.

Since a Preferred Alternative had not been selected at the time this MESA was completed and a Preferred Alternative footprint or centerline was not available, the Castlegate Drive West/Atrium Drive intersection was selected as the point from which the search distance to review the federal, state, and local environmental databases was conducted. The Castlegate Drive West/Atrium Drive intersection is the approximate center of the study area. Consequently the ASTM Search distance was expanded for each federal, state, and local environmental database to include sites within and adjacent to potential Refined Alternatives 6 and 7 right-of-way within the project area. The agency database screening is only as accurate as the Environmental Data Resources, Inc. (EDR) mapping. When possible, the actual location of sites was verified during site reconnaissance activities and agency file review. Based on this information, sites were re-mapped, as necessary.

This MESA report does not guarantee that no environmental contamination exists within the study area beyond that described at the time of writing this report. Therefore, conclusions presented herein are not necessarily indicative of future conditions or operating practices surrounding the study area. No warranties, expressed or implied, are made. All conclusions and recommendations represent the professional opinions of the FHU personnel involved with the MESA and the results should not be considered a legal interpretation of existing environmental conditions.

## 1.4 Terminology

This section provides a brief explanation of some of the common terminology utilized within the MESA report.

- ▶ **Hazardous Materials**—The term hazardous materials is an all-inclusive term for materials that are regulated as solid waste, hazardous waste, and other wastes contaminated with hazardous substances, radioactive materials, petroleum fuels, toxic substances, and pollutants.
- ▶ **Recognized Environmental Conditions**—For this MESA report, sites associated with the study area, which were identified as having known (current and historic) soil or groundwater contamination, are distinguished in this report as sites with recognized environmental conditions. Recognized environmental conditions, as defined by ASTM, include sites with *“the presence or likely presence of any hazardous substances or petroleum products on a*



*property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property.”*

- ▶ **Potential Environmental Conditions**—Sites associated within the study area that are identified as having potential soil or groundwater contamination, but could not be confirmed without additional inspection or investigation are distinguished in this report as sites with potential environmental conditions.
- ▶ **De minimis Conditions**—Sites identified with recognized environmental conditions do not include sites with *de minimis* conditions, which are defined by ASTM as “*conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be subject of an enforcement action if brought to the attention of appropriate governmental agencies.*” For the purposes of this MESA, the term *de minimis* conditions was expanded to include conditions that would not require a Materials Management Plan in accordance with Section 250 Environmental, Health, and Safety Management of the CDOT Standard Specifications for Road and Bridge Construction (CDOT 2005).



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## 2.0 ENVIRONMENTAL SETTING

The project is located in the Town of Castle Rock in Douglas County along the Front Range of the Rocky Mountains in central Colorado. Douglas County is located at the base of the Rampart Range of the Rocky Mountains. The local climate is semi-arid with low relative humidity, low precipitation, and high evaporation. The topography of the study area is a rolling river valley with local scarps present where resistant bedrock outcrops from the alluvium. The study area is located north of the Palmer Divide in the Plum Creek basin, which drains north into the Platte River basin. East Plum Creek flows from the south across the study area.

### 2.1 Geology

The study area is located in the Colorado Piedmont section of the Great Plains physiographic province (Benson and Turina 2000). The Colorado Piedmont formed approximately 2 million years ago during the Late Tertiary and Early Quaternary and is a broad erosional trench that separates the Great Plains from the southern Rocky Mountains. The topography of the Colorado Piedmont is characterized by broad valleys and relatively level upland areas. The Colorado Piedmont is located on the western portion of the Denver Basin.

In the study area, the Denver Basin consists of the Castle Rock Conglomerate, Dawson Arkose, and the Upper Denver formation (Benson and Turina 2000). The Castle Rock Conglomerate overlies the Dawson Arkose formation at higher elevations, such as the mesa located west of the study area. The Upper Denver Formation underlies the Dawson Arkose formation at depth in the Castle Rock area. The Dawson and Denver Formations are of the Paleocene and Upper Cretaceous age and contain sandstone, siltstone, claystone, and some conglomerate. Thin layers of residual soils along with possibly colluvium and alluvium are typically present overlying the bedrock. Upper Pleistocene-age Louviers Alluvium and Pleistocene-age Slocum Alluvium are present along East Plum Creek.

### 2.2 Major Groundwater Aquifers

The regional geology within the study area consists of Tertiary to Cretaceous aged claystone, siltstone, and sandstone bedrock of the lower part of the Denver Formation and overlying alluvium deposited by East Plum Creek. The Castle Rock Conglomerate is well-drained, consists of fine to coarse arkosic sandstone and conglomerate, and does not yield groundwater.

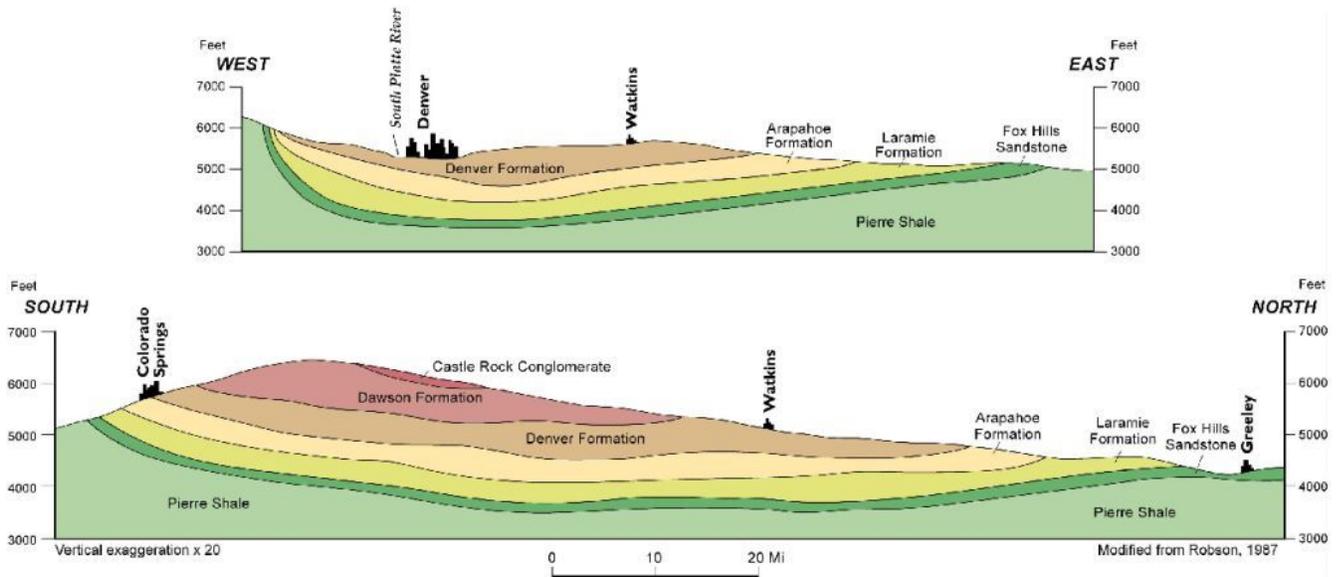
#### Bedrock Aquifers

The sedimentary rock geologic layers that make up the Denver Basin include the Laramie–Fox Hills Sandstone, Laramie, Arapahoe, Dawson, and Denver Formations. The water-yielding portion of the Denver Basin is approximately 6,700 square miles in area and underlies a portion of the study area. Groundwater from the Denver basin aquifers supplies a mix of domestic, commercial, industrial, and agricultural uses (Flynn 2003; Topper et al. 2003).

The Denver basin consists of four principal sedimentary rock aquifers with three that underlie a portion of the study area, including the Denver, Arapahoe, and the Laramie–Fox Hills aquifers (**Figure 2 General Geologic Cross Section through the Denver Basin**). It is estimated that the bedrock aquifers of the Denver basin combined store approximately 470-million acre-feet of water, with approximately 270 million acre-feet being recoverable (Aikin et al. 2000). Saturated thickness within these aquifers ranges from 0 to 400 feet (ft). Precipitation is the main source of groundwater in the Denver Basin aquifers, whereas groundwater recharge is primarily limited to outcrop areas. Water level declines in the Denver Basin aquifers are primarily due to

withdrawals in excess of the local recharge rates, whereas recharge rates are highly dependent upon the permeability of the layers of shale that separate each of the aquifers (Aikin et al. 2000; Arbogast et al. 2002).

**Figure 2 General Geologic Cross Sections through the Denver Basin**



SOURCE: Topper et al. 2003, Fig. 6.1-3, p. 86.

- ▶ The Laramie–Fox Hills aquifer is the oldest and deepest of the three bedrock aquifers in the study area. This aquifer is generally confined, moderately permeable, with a water-yielding material thickness range of up to 300 ft (Aikin et al. 2000). The aquifer consists mainly of sandstone and siltstone interbedded with shale from the Fox–Hill sandstone and Laramie formations. Water supply from this bedrock aquifer is mainly for domestic and municipal water uses and yields up to 350 gallons per minute (gpm) (Robson, as cited in Aikin 2000; Topper et al. 2003).
- ▶ The Arapahoe aquifer is located above the Laramie–Fox Hills aquifer and is the most permeable and heavily used aquifer within the Denver basin. The Arapahoe aquifer is generally confined and consists of 400 to 700 ft of conglomerate, sandstone, siltstone, and shale (Aikin et al. 2000). Water supplied by this aquifer is mainly for municipal purposes and yields up to 700 gpm (Robson, as cited in Aikin et al. 2000; Topper et al. 2003).
- ▶ The uppermost sedimentary rock aquifer underneath the study area is the Denver aquifer, which consists of 800 to 1,000 ft of shale, silty claystone, and sandstone (Topper et al. 2003). This aquifer is generally confined and the least permeable of the Denver basin aquifers, yielding up to 200 gpm and supplying groundwater mainly for domestic and municipal uses (Robson, as cited in Aikin et al. 2000; Topper et al. 2003).



### **Shallow Aquifers**

Within the Front Range urban corridor, the primary water-bearing shallow aquifers are present within unconsolidated deposits (20 to 100 ft in thickness) of Quaternary age (0 to 1.8 million years ago) and floodplain alluvium, low, and medium terrace gravel deposits of the lower South Platte River basin and its tributaries (Arbogast et al. 2002). Much of the study area is in the vicinity of the East Plum Creek floodplain, and therefore the shallow aquifers are associated with the alluvium deposited by East Plum Creek. The Post-Piney Creek alluvium (Upper Holocene) and Louviers alluvium can be found in the vicinity and generally consists of cobbly gravels, some boulders, and silty sand (Arbogast et al. 2002).

Depth to groundwater within the study area is approximately 20 ft below ground surface (bgs) and generally flow occurs in the same easterly direction of the surface flow within East Plum Creek (Robson 1996). In general, groundwater flow direction varies, but generally moves downstream and toward drainages (Topper et al. 2003). Groundwater flow may be independently influenced by water table elevations and may flow from areas with high water table elevations to areas with lower water table elevations, which may not be consistent with the direction of flow for surface water. Local groundwater conditions may be significantly influenced by the position of underlying valleys and paleochannels within the bedrock surface (Aikin et al. 2000; Topper et al. 2003).



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### 3.0 SITE RECONNAISSANCE

FHU contracted EDR to conduct a database search of local, state, and federal records for information relating to sites with potential soil and groundwater contamination within or adjacent to the study area (**Chapter 5.0 Agency Records and Previous Investigations Reviewed**). FHU reviewed the sites identified in the EDR database report and then conducted a “windshield survey” site reconnaissance of the study area. The objective of the site reconnaissance was to obtain information indicating the likelihood of identifying potential or recognized environmental conditions in connection with sites within the study area.

Mr. Kevin Maddoux, an environmental scientist with FHU, performed the limited site reconnaissance activities on February 6, 2008. The “windshield survey” included a limited visual inspection of sites located within and adjacent to public right-of-way within the study area and areas immediately adjacent to the study area. The visual survey of sites included inspection for evidence of potential environmental conditions, such as:

- ▶ Presence of ASTs and secondary containment for spill prevention;
- ▶ Evidence of USTs, including fill ports, vent pipes, and fueling facilities;
- ▶ Disposal of solid waste, waste management practices, and general good housekeeping of waste storage/disposal areas;
- ▶ Evidence of on-site dumping and landfilling;
- ▶ Presence of types of equipment that have been historically associated with the use of polychlorinated biphenyls (PCBs) as a dielectric fluid coolant and stabilizer;
- ▶ Handling and storage of hazardous materials, such as the presence of 55-gallon drums, tote containers, etc.; and
- ▶ Presence of drains, sumps, septic systems, wastewater discharges, pits, ponds, or lagoons.

Modifications to the guidance on site reconnaissance and project limitations are discussed in **Section 1.3 Guidance Modifications and Limitations**.

The study area is situated in an urban area, and land use within the study area includes residential, commercial, and industrial uses, as well as undeveloped properties (formerly agricultural/pasture land). I-25 and US 85 parallel each other until US 85 intersects I-25 at the I-25/Meadows Parkway interchange. US 85 is a two-lane major regional transportation arterial that enters the Town of Castle Rock from the northwest. CDOT is currently improving segments of US 85 with the goal of establishing a four-lane expressway from Denver south to Castle Rock. Meadows Parkway is a four- and six-lane major arterial that serves the northwest portion of the Town of Castle Rock. Meadows Parkway, a portion of which is also designated as US 85, is a six-lane major arterial west of I-25 to the intersection where US 85 diverges and heads northwest. Meadows Parkway continues west of US 85 as a four-lane divided arterial that passes over the UPRR tracks and East Plum Creek on a long bridge and passes under the BNSF tracks. Meadows Parkway is the only northern access into The Meadows area from US 85 and I-25. East of I-25, Meadows Parkway becomes Founders Parkway.

West of US 85 is the UPRR, East Plum Creek, and BNSF railway, which parallel US 85 through the study area. The Meadows area, a primarily residential area, is located west of the BNSF railway and includes the Castle View High School and Castle Rock Middle School located along Meadows Boulevard. Most of the land between The Meadows area and US 85 is undeveloped,



although this area has been platted for retail/commercial use. South of Meadows Parkway is an area comprised of commercial, industrial, and municipal properties. North of Meadows Parkway between US 85 and I-25 are the Factory Outlet stores, a daycare facility, Castle Villas Condominiums, The Pines apartment complex, the Castle Pines Village residential area, and undeveloped properties that have been platted for retail/commercial use. East of I-25 are commercial properties, the Silver Heights residential area, the Happy Canyon residential area, a church, and undeveloped land.

Two railroad corridors, UPRR and BNSF, transect the study area. No evidence of potential soil and groundwater impacts were identified associated with the UPRR and BNSF railroads during the site reconnaissance. However, impacts to soil and groundwater along the railroad corridors may exist due to undocumented events and an accumulation of drips, leaks, and spills over time.

Sites that were identified with potential environmental conditions during the site reconnaissance but were also identified with recognized environmental conditions during the database screening and ranking are discussed in **Chapter 5.0 Agency Records and Previous Investigations Review**. **Table 1 Sites with Potential Environmental Conditions–Site Reconnaissance** identifies sites with potential environmental conditions identified during the site reconnaissance.

**Table 1 Sites with Potential Environmental Conditions–Site Reconnaissance**

Site Name	Address/Location	Concern
Ludwig Caisson Drilling	3613 N. US 85	Caisson drilling company with a large inventory of drilling equipment stored on-site. Unknown equipment maintenance and hazardous materials management practices.
Dependable Cleaners	62 Founders Parkway	Dry cleaners. Unknown hazardous materials management practices.
Conoco Phillips	238 Allen Street	Gasoline service station. Two 15,000-gallon USTs for gasoline currently in use on site. No spills or leaks reported.



## 4.0 HISTORICAL USE INFORMATION

To evaluate the past uses of the study area, FHU conducted a historical review of land use in the study area. A review of historical research documents and historical aerial photographs was conducted to “*establish a history of the previous uses of the property and surrounding area, in order to help identify the likelihood of past uses having led to recognized environmental conditions*” (ASTM 2005). FHU reviewed historic aerial photographs of the study area at Colorado Aerial Photo Service (CAPS) in approximately five-year increments, including the years 1948, 1953, 1959, 1965, 1974, 1979, 1984, 1989, and 1995 (CAPS 2008).

Aerial photographs have been collected for the continental United States since the mid-1930s, with variable coverage and frequency (generally based upon an area's importance to national defense). Aerial photographs offer an opportunity for direct observation of site conditions through a period of time. These observations may include the locations of tanks, drums, pits, ponds, lagoons, stained/stressed vegetation, or other site development features that can indicate environmental conditions.

No sites with potential environmental conditions were identified during the historical use review.

### 4.1 Historical Overview

Prior to the 1860s, the East Plum Creek valley was not permanently inhabited but experienced periodic visits from Native American tribes and Euroamerican explorers. Passage of the Homestead Act of 1862 facilitated settlement and agricultural development of the plains and foothills of Colorado, including the East Plum Creek valley. The Homestead Act of 1862 was the first of several laws allowing settlers to occupy, farm, and acquire title to public lands.

By the late 1860s, the town of Denver had grown into a regionally important population center, and transportation and supply hub, prompting the development of new inter- and intra-regional transportation links. In 1870, William J. Palmer and associates incorporated a new narrow (3-foot wide) gauge rail line, the Denver & Rio Grande (D&RG) Railroad, to extend southward from Denver to other outposts of civilization along the Front Range. In 1871, the tracks were laid south to Colorado Springs and Pueblo (Wilkins 1974). By the end of the century, the D&RG system had been greatly expanded by the addition of new lines throughout southern, western, and central Colorado, and it ultimately became the most extensive railroad system in the state (Wilkins 1974).

The D&RG's subsidiary company, the National Land and Improvement Company, established townsites along the way. In 1874 the townsite of Castle Rock was established. The settlements of Douglas, New Memphis, Glade, Franktown (established 1861) and Sedalia vied with Castle Rock for the role of county seat. On March 31, 1874, voters in Douglas County chose Castle Rock, ensuring its future growth and importance (Appleby 2001). The preeminence of Castle Rock led to the demise of the small settlements of New Memphis and Douglas. Today, virtually nothing remains of these early Douglas County communities.

One industry that added to Castle Rock's economy in the 1870s and 1880s was the quarrying of locally abundant rhyolite. Several major commercial quarries were established on buttes in the Castle Rock area, providing the distinctive pinkish stone to building contractors in Denver, Colorado Springs, Pueblo, Omaha, Cheyenne, and Kansas City (Harvey and Harvey 1946; Marmor 2002).



A new railroad line—the Denver & Santa Fe (D&SF) Railway—was constructed from Pueblo to Denver in 1887. The D&SF was incorporated in March of 1887 as a subsidiary of the Atchison Topeka & Santa Fe (ATSF) Railway, in order to establish a link from Pueblo to the burgeoning city of Denver. The D&SF line was sold to the ATSF in January of 1900, and remained under ATSF ownership until late 1995, when the Santa Fe Pacific Corporation (parent company of the Burlington Northern Railroad) merged to form a new company, the BNSF. The BNSF still operates the line.

A pioneer trail that had been established along the East Plum Creek Valley by the mid-1860s was later developed into a major roadway connecting a series of Front Range towns, including Colorado Springs, Larkspur, Castle Rock, and Denver (USGS 1913, 1940, 1945). Sometime after the establishment of the Colorado Highway Commission (1909), this major north-south route was designated US 85. This important transportation corridor was selected for improvement under the aegis of the Interstate Highway Act. In Douglas County, the new high speed highway generally followed the path of US 85, paralleling East Plum Creek almost as far south as Larkspur, where the route deviated to the east, bypassing Palmer Lake and following a shorter and straighter path to Colorado Springs. North of Castle Rock, the new interstate highway left the East Plum Creek Valley to follow a straighter northward path to Denver by crossing a broad ridge system. I-25 was completed in 1967.

#### *4.2 Study Area and Immediate Vicinity*

The study area and immediate vicinity consisted of primarily agricultural land with scattered residences until the 1960s/1970s (CAPS 2008). The I-25/Meadows Parkway interchange and the Silver Heights residential neighborhood was constructed at this time with the majority of the residences located immediately adjacent to I-25 constructed in the late 1970s. The Happy Canyon neighborhood on the east side of I-25 was also constructed during the late 1970s. In addition, two ponds, potentially water treatment lagoons, were located in the area between I-25 and US 85 at approximately Atrium Avenue, and several commercial facilities were located south of the study area along former US 85 (CAPS 2008). Other than the two ponds, no evidence of structures or on-site land disposal, was visible on the undeveloped properties between I-25 and US 85 and US 85 and The Meadows subdivision.

In the early 1980s, the Castle Pines Village neighborhoods along Happy Canyon road were initiated (CAPS 2008), and by the late 1980s, The Meadows subdivision, west of East Plum Creek, was under construction (CAPS 2008). By the early 1990s, the Castle Rock Factory Outlet Mall was constructed, which replaced the two ponds in the area, and the Plum Creek Wastewater Facility at approximately US 85/Happy Canyon Road was also constructed. The commercial areas near the I-25/Meadows Parkway interchange continued to expand (CAPS 2008).



## 5.0 AGENCY RECORDS AND PREVIOUS INVESTIGATIONS REVIEW

FHU contracted EDR to conduct a database search of local, state, and federal environmental records. **Table 2 Database Description, Approximate Minimum Search Distance, and Summary of EDR Database Search Findings** identifies the minimum search distance for each local, state, and federal environmental database reviewed.

The full EDR database report is included in **Appendix A EDR Database Report**.

**Table 2 Database Description, Approximate Minimum Search Distance, and Summary of EDR Database Search Findings**

Database	ASTM Approximate Minimum Search Distance (mile) <sup>1</sup>	Radius Searched (mile)	Sites Found <sup>2</sup>
Federal National Priorities List site list (NPL) - EPA's database of uncontrolled or abandoned hazardous waste sites identified for priority remedial actions under the Superfund Program.	1.0	2.0	0
Federal Delisted NPL site list	1.0	2.0	0
Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) and Federal CERCLIS NFRAP site list - Compilation by the EPA of sites at which the potential exists for contamination originating from on-site hazardous substance storage or disposal. Sites designated as CECLIS NFRAP indicate that No Further Remedial Action is Planned.	0.5	2.0	0
Federal RCRA Corrective Action (CORRACTS) facilities list - Sites identified as needing Corrective Action after a release of a hazardous waste or constituent into the environment from a RCRA facility.	1.0	2.0	0
Federal RCRA treatment, storage, or disposal (TSD) facilities - RCRA permitted TSD facilities	0.5	2.0	0
Federal Resource Conservation and Recovery Act (RCRA) generators list - Facilities that are regulated based on current hazardous waste generation management activities.	Site and Adjoining Properties	2.0	9
Federal institutional control/engineering control registries			0
Federal/State Emergency Response Notification System (ERNS) List - Database of public complaints and reports of unverified releases or incidents.	Site Only	1.0	1
State-and tribal-equivalent NPL	1.0	2.0	0
State- and tribal-equivalent CERCLIS:	1.0	2.0	0
State and tribal landfill (LF) and /or solid waste disposal (SWF) site lists - Inventory of solid waste and landfill facilities.	0.5	2.0	0



**Table 2 Database Description, Approximate Minimum Search Distance, and Summary of EDR Database Search Findings (continued)**

Database	ASTM Approximate Minimum Search Distance (mile) <sup>1</sup>	Radius Searched (mile)	Sites Found <sup>2</sup>
State and tribal leaking storage tank lists (LUST) - List of closed or unremediated reported LUSTs and CO Trust list – List of all complaint sites where there is no known responsible party.	0.5	2.0	5
State and tribal registered storage tank lists - Above Ground Storage Tank (AST)/Underground Storage Tank (UST) - List of sites that registered the presence of ASTs/USTs with the Colorado Department of Labor and Employment Division of Oil and Public Safety (OPS)	Site and Adjoining Properties	2.0	17
State and tribal institutional control/engineering control registries			0
State and tribal voluntary cleanup (VCUP) sites - Sites being addressed under the Colorado Department of Public Health and Environment (CDPHE)	0.5	2.0	0
State and tribal Brownfield sites			0
Drycleaners			1

SOURCES: (1) ASTM  
 (2) EDR 2008

Sites within or immediately adjacent to the study area, which were identified in the EDR database records search were selected for a detailed records review. Of the 33 sites identified in the EDR Report, 10 were identified as within or immediately adjacent to the study area. These sites are summarized in **Table 3 Sites with Potential or Recognized Environmental Conditions – Agency Records**.



**Table 3 Sites with Potential or Recognized Environmental Conditions–Agency Records**

Site Name/Address	Type of Environmental Concern	Description
The Pines Apartments/Castle Villa Condos 6209 Castlegate Dr. West – Unit 1416	Potential	Methamphetamine Laboratory The South Metro Task Force responded to an apartment on April 23, 2002. A boxed methamphetamine laboratory was located disassembled in a large black plastic storage trunk in the living room. No evidence of any chemical spills identified.
Woerner Engineering Inc 3026 N. US Hwy 85	Potential	RCRA-Conditionally Exempt Small Quantity Generator No violations reported.
Allen Oil Co. 2911 Hwy 85	Potential	One 6,000-gallon UST for gasoline permanently closed by this owner at this site. No spills or leaks reported.
Shawnee Construction Co. Inc. 2911 Hwy 85	Potential	Two 10,000-gallon USTs for diesel and gasoline, one 5,000-gallon UST for gasoline, and one 500-gallon UST for waste oil permanently closed by this owner at this site. No spills or leaks reported.
The Home Depot 333 Allen St.	Potential	RCRA Small Quantity Generator No violations reported.
Young's Cleaners 312 Allen St.	Potential	Drycleaners. RCRA-Conditionally Exempt Small Quantity Generator No violations reported.
Conoco Phillips 238 Allen Street	Potential (also identified during the site reconnaissance)	Two 15,000-gallon USTs for gasoline currently in use on site. No spills or leaks reported.
Botanical Standards Inc 3155 N. Commerce Ct. Bldg B	Potential	RCRA-Conditionally Exempt Small Quantity Generator No violations reported.
Shell Oil 246 Founders Pkwy	Recognized	RCRA Small Quantity Generator. No violations reported. UST. Active LUST. Known petroleum contaminated soil and groundwater in vicinity of site.



**Table 3 Sites with Potential or Recognized Environmental Conditions–Agency Records (continued)**

Site Name/Address	Type of Environmental Concern	Description
Martorano 805 E. Pawnee Trail	Recognized	Closed LUST. No further action letter sent by OPS on July 16, 2002. OPS defines LUST site as closed/clean up complete when “the owner and/or operator has not necessarily removed all contamination, but instead actions taken have met the criteria that the states uses for determining adequate clean up.” Residual impacted soil and groundwater may be present.
Douglas County School Service Center 2808 N Hwy 85	Potential	One 20,000-gallon UST for gasoline, one 20,000-gallon UST for diesel, one 10,000-gallon UST for diesel, two 1,000-gallon USTs for lube oil, and one 560-gallon UST for used oil currently in use on site. One 18,000-gallon UST for diesel permanently closed on site. No spills or leaks reported. RCRA Small Quantity Generator. No violations reported.
Town of Castle Rock Maintenance 675 Justice Way	Potential	One 1,000-gallon liquefied petroleum gas AST. No spills or leaks reported. RCRA-Conditionally Exempt Small Quantity Generator No violations reported.

### 5.1 Previous Investigations

ARCADIS Geraughty & Miller performed a Phase I Environmental Site Assessment, Modified Phase I Environmental Site Assessment, and Phase II Environmental Investigation for the South I-25 and US 85 Corridor DEIS, which included the study area. **Table 4 Previous Investigation Findings** summarizes the sites that were previously identified in the study area or adjacent to the study area.

**Table 4 Previous Investigation Findings**

Site Name/Address	Type of Environmental Concern	Description
Castle Rock Care Center 4233 N. Home St.	Recognized	Closed LUST: Closed/Clean up complete. No further action letter sent on October 16, 1996.
Silver Heights Landfill	Recognized	Inactive landfill. Unknown groundwater contamination or potential methane.
Loaf N Jug #11 4901 N. Castleton Dr.	Recognized	UST: Three active 8,000 to 12,000 gallon tanks for diesel and gasoline. Closed LUST: No further action letter sent on November 3, 2000.



## 6.0 FINDINGS AND RECOMMENDATIONS

FHU performed this MESA on the North Meadows Extension to US 85 and I-25 project consistent with the CDOT hazardous materials guidelines (CDOT EPB 2005), as modified from the ASTM Designation E1527-05, “Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process” (ASTM 2005) and EPA Standards and Practices for All Appropriate Inquiries [40 CFR Part 312] (USEPA 2005). Any findings and recommendations presented in this report are geared specifically to address the issues regarding hazardous material that would affect a roadway planning, design, and construction project. This MESA has been prepared with a level of detail appropriate for the North Meadows Extension to US 85 and I-25 project and identifies sites with potential and recognized environmental conditions associated with the study area.

The findings and recommendations of this MESA must be viewed in recognition of certain limiting conditions. Results of this MESA are based upon a limited visual site inspection and observation of current conditions within the study area and review of readily available standard historical sources and environmental agency databases. Modifications to the standard Phase I ESA process are discussed in **Section 1.3 Guidance Modifications and Limitations**.

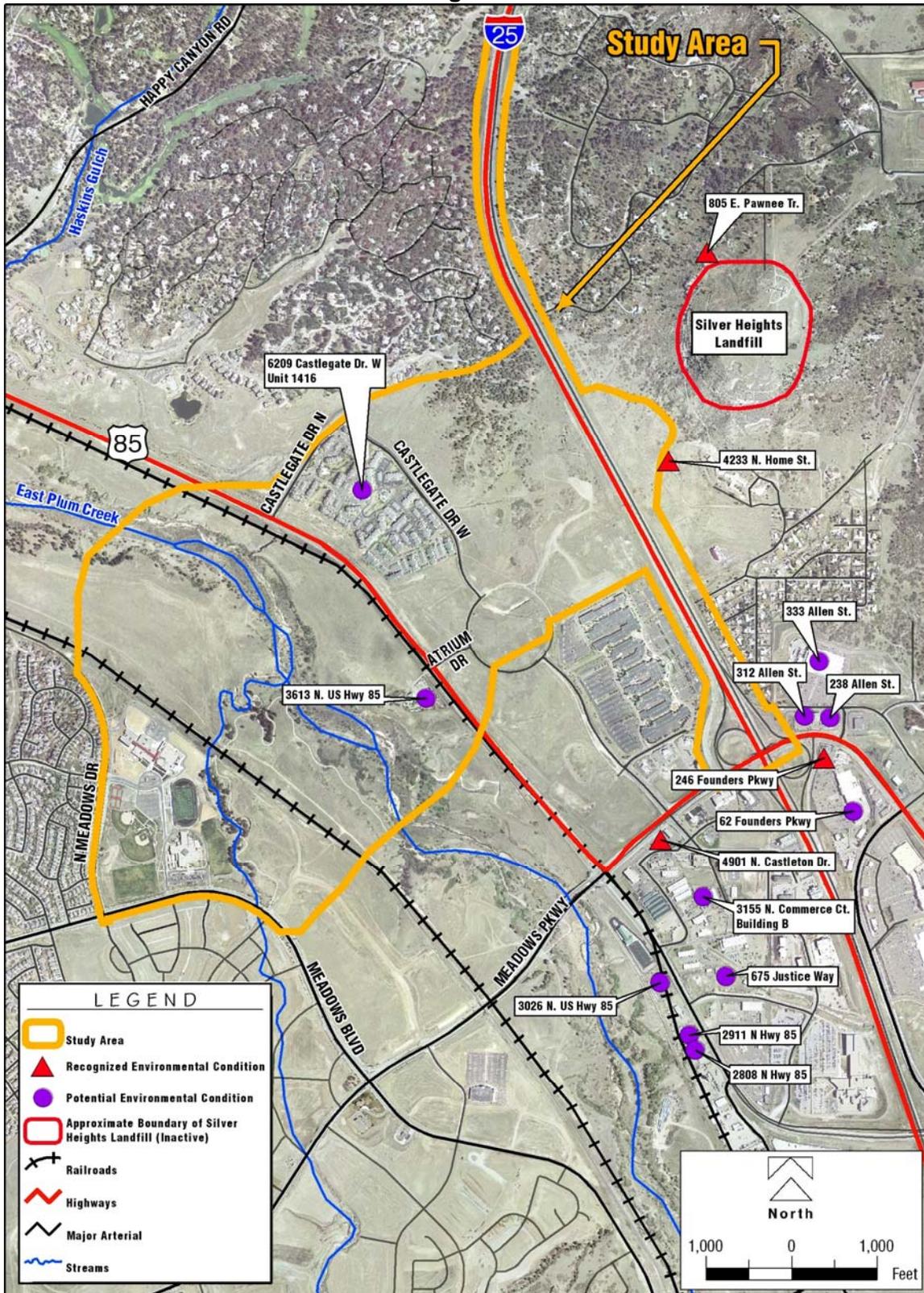
Due to limitations, the complete environmental history of sites within the study area may not be fully identified solely by the performance of site reconnaissance activities, historical, and agency document reviews. In the course of this assessment, FHU has relied on information provided by outside parties, such as regulatory agencies. FHU has made no independent investigations as to the validity, completeness, or accuracy of such information provided by third party sources. For the purposes of this MESA, such third party information is assumed to be accurate unless contradictory evidence is noted. FHU does not express or imply any warranty regarding information provided by third party sources.

### 6.1 Findings

**Figure 3 Sites with Potential and Recognized Environmental Conditions** identifies sites with potential and recognized environmental conditions within and adjacent to the study area. Three sites with potential environmental conditions were identified during the site reconnaissance (**Table 1 Sites with Potential Environmental Conditions – Site Reconnaissance**). No sites with potential environmental conditions were identified during the historical use review. Seven sites with potential environmental conditions and five sites with recognized environmental conditions were identified during the agency records and previous investigations review (**Table 3 Sites with Potential or Recognized Environmental Conditions – Agency Records** and **Table 4 Previous Investigation Findings**).

As shown on **Figure 3 Sites with Potential and Recognized Environmental Conditions**, the majority of the sites identified are located south of the study area along Meadows Parkway and Founders Parkway. Only two sites with potential environmental conditions were identified within the study area. Three sites with recognized environmental conditions, two LUST sites and the inactive Silver Heights landfill, were identified east of the study area.

Figure 3 Sites with Potential and Recognized Environmental Conditions





## 6.2 Recommendations

Based on the findings of the MESA, FHU makes the following recommendations.

### **Removal of Structures/Obstructions**

Pole-mounted electrical transformers were not identified as part of site reconnaissance activities. However, relocation of overhead electrical utility lines and pole-mounted transformers will be identified in project plans and specifications. Performance of the work set forth in the project plans and specifications will be conducted in accordance with any easement agreement between CDOT and/or private landowners, and the utility company.

### **Contaminated Soil and Groundwater Management**

Encountering contaminated soil and groundwater during construction without prior knowledge can potentially affect the project in terms of cost, schedule, and agency and public relations. Three sites with recognized environmental conditions, two LUST sites and the inactive Silver Heights landfill, were identified east of the study area. Two railroad corridors, UPRR and BNSF, transect the study area. No evidence of potential soil and groundwater impacts were identified associated with the UPRR and BNSF railroads during the site reconnaissance. However, impacts to soil and groundwater along the railroad corridors may exist due to undocumented events and an accumulation of drips, leaks, and spills over time. A Materials Management Plan (MMP), as required by Section 250.03 of the CDOT Standard Specifications for Road and Bridge Construction (CDOT, 2005), will be prepared for areas with known soil and groundwater contamination and provide protocols in the event of encountering undocumented soil or groundwater contamination.

### **Methane Gas Management**

Due to the potential presence of remnant methane gas associated with the Silver Height landfill, this site presents a potential explosion hazard and worker health and safety concern. Methane gas and other landfill gases can migrate along drains, trenches, and underground utility corridors or within natural subsurface geology up to distances over 1,500 feet.

If the abandoned landfill is present below and/or within 1,000 feet of construction activities, the Health and Safety Plan will need to include provisions for assessing and monitoring air quality at all utility trenches, drainage structures, and similar underground construction (i.e., caissons) areas prior to and during intrusive activities to ensure worker safety. Under 29 CFR Part 1926.651(g) Specific Excavation Requirements, Hazardous Atmosphere, Occupational Safety and Health Administration (OSHA) requires testing the atmosphere of excavations greater than four feet in depth before employees enter the excavation where oxygen deficient (less than 19.5 percent oxygen) environments exist or could reasonably be expected to exist. OSHA also requires that precautions be taken to prevent employee exposure to atmospheres containing less than 19.5 percent oxygen and other hazardous atmospheres.

CDOT specification 250.02 states that monitoring equipment shall be capable of meeting the set standards of 1 percent of the lower explosive limit for flammable gas with an instrument measurement increment of 1 percent and 19 percent oxygen with an instrument measurement increment of 0.1 percent.



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## 7.0 REFERENCES

- Appleby, Susan Consola. 2001. *Fading Past; The Story of Douglas County, Colorado*. Palmer Lake, Colorado: Filter Press, L.L.C.
- Arbogast, Belinda F., L. Rick Arnold, Neil S. Fishman, William H. Langer, Carol S. Mladinich, James E. Roelle, and David R. Wilburn. 2002. USGS Front Range Infrastructure Resources Project. US Geological Survey Circular 1219. Planning for the Conservation and Development of Infrastructure Resources in Urban Areas – Colorado Front Range Urban Corridor.
- Aikin, Andrea, Anderman, E., Harmon, E., Paschke, S., Plazak, D. & M. Riemann. 2000. Colorado Ground-Water Association. Colorado Ground-Water Atlas.
- American Society for Testing and Materials. 2005. ASTM Designation E 1527-05, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process.
- Benson, Jeff and Frank Turina (CH2M Hill). 2000. *Geology Technical Memorandum South I-25 Corridor and US 85 Corridor DEIS*. October.
- Colorado Aerial Photo Service (CAPS). 2008. Aerial Photographs: May 31, 1973; October 15, 1978; November 18, 1984; September 24, 1989; October 10, 1994; October 4, 1999; and October 8, 2004. Reviewed aerial photographs on January 17, 2008.
- CDOT. 2005. Standard Specifications for Road and Bridge Construction.
- CDOT Environmental Programs Branch (EPB). 2005. Hazardous Materials Guidance. December 6.
- Environmental Data Resources, Inc. (EDR). 2008. EDR Radius Map, North Meadows Extension Atrium Drive/Castlegate Drive West, Castle Rock, CO 80108. January 14.
- Flynn, Jennifer L. 2003. USGS Water Resources Investigations Report 02-4247. Groundwater Quality Assessment of Shallow Aquifers in the Front Range Urban Corridor, Colorado, 1954-1998.
- Harvey, James Rose and Mrs. James Harvey. 1946. The quarries of the Castle Rock area. *The Colorado Magazine*, Volume XXIII, Number 3 (May 1946), pp. 114-118.
- Marmor, Jason. 2002. *A Historical Resources Inventory for the Proposed Crystal Valley/Dawson Ridge Interchange on Interstate 25, Douglas County, Colorado*. Report prepared for PBS&J and the Colorado Department of Transportation by Entranco, Fort Collins, Colorado, December.
- Robson, S.G. 1996. Geohydrology of the Shallow Aquifers in the Denver Metropolitan Area, Colorado. United States Geological Survey.
- Topper, R., Spray K., Bellis, W., Hamilton, J., Barkmann. P. 2003. Colorado Geological Survey. Ground Water Atlas of Colorado. Special Publication 53.
- USEPA. 2005. Standards and Practices for All Appropriate Inquiries, Final Rule. Federal Register 70 (November 1): 66070 – 66113.



US Geological Survey (USGS). 1913. *Castle Rock, Colorado* topographic quadrangle, Scale 1:125,000 (30 minute series). On file at the Denver Public Library, Western History Department.

USGS. 1940. *Castle Rock, Colorado* topographic quadrangle, Scale 1:62,500 (15 minute series). On file at the Denver Public Library, Western History Department.

USGS. 1945. *Castle Rock, Colorado* topographic quadrangle, Scale 1:125,000 (30 minute series). On file at the Denver Public Library, Western History Department.

Wilkins, Tivis E. 1974. *Colorado Railroads, Chronological Development*. Boulder, Colorado: Pruett Publishing Company.



## 8.0 SIGNATURES AND QUALIFICATIONS

The preceding report has been prepared in accordance with standard industry practice for performance of a Modified Phase I Environmental Site Assessment and includes the applicable portions of the procedures codified in ASTM 1527-05, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, USEPA Standards and Practices for All Appropriate Inquiries, and CDOT hazardous materials guidance. The end user of this report may rely on the contents, findings, and conclusions to be accurate within the limitations stated herein. The report also complies with specific requirements supplied by the Client. FHU performed this work for the sole purpose of assisting in the evaluation of potential and recognized environmental conditions associated with the properties within the study area.

The following sections provide the qualifications of the environmental professionals who conducted this Modified Phase I Environmental Site Assessment.

### 8.1 *Kevin R. Maddoux*

#### **Education**

- ▶ B.A. Environmental Science, University of Denver, 1997.
- ▶ B.A. International Studies, University of Denver, 1997.
- ▶ Graduate Studies, Geography, University of Denver, 1998 to 1999.
- ▶ Certificate Environmental Policy, University of Denver, 2004.
- ▶ Master of Environmental Policy and Management, University of Denver, 2005.

#### **Training**

- ▶ ASTM: Environmental Site Assessments for Commercial Real Estate, 2001.
- ▶ Continuing Legal Education (CLE): NEPA, 2005.
- ▶ National Highway Institute (NHI): Fundamentals of Title VI/Environmental Justice, 2005.
- ▶ FHWA and CDOT: Endangered Species Act Interagency Coordination and Cooperation, 2005.
- ▶ American Council of Engineering Companies (ACEC): Future Leaders Supervisory Course, 2006.
- ▶ PSMJ Resources, Inc.: Project Management Bootcamp, 2006.

Mr. Maddoux is an environmental scientist with ten years of experience in environmental site assessment/due diligence, subsurface investigation, environmental management, and impact assessment. He has extensive experience developing Categorical Exclusions (CatExs), Environmental Assessments (EAs), Environmental Impact Statements (EISs), and environmental overview studies (EOSs) for transportation-related projects in Colorado. Mr. Maddoux has conducted numerous Phase I Environmental Site Assessments for a variety of industrial, commercial, and agricultural properties, including manufacturing facilities; properties impacted by abandoned underground coal mines; agricultural sites; automotive and heavy machinery maintenance facilities; clay and gravel pits; livestock treatment and sale lots; office buildings; automotive dealerships; oil and gas well sites; concrete batch and forming plants; and commercial and residential properties. In addition, Mr. Maddoux has performed Modified Phase I Environmental Site Assessments for a variety of transportation corridors and projects,



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including the I-25 Valley Highway EIS, Northwest Corridor Transportation and Environmental Planning Study, I-225/Colfax Avenue EA, Weld County Road 13, and I-25 Trinidad CatEx. He has also managed Phase II Environmental Investigations identifying potential subsurface soil and groundwater contamination, asbestos containing materials, heavy-metal based paint, and hazardous materials requiring specific-management protocols. He has assisted in developing due diligence costs for property acquisition, as well as determining the necessary steps to ensure regulatory compliance following property acquisition.

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Qualified Assessor/Report Preparer  
Kevin Maddoux  
Environmental Scientist



**APPENDIX A            EDR DATABASE REPORT (SEE  
ATTACHED CD)**



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