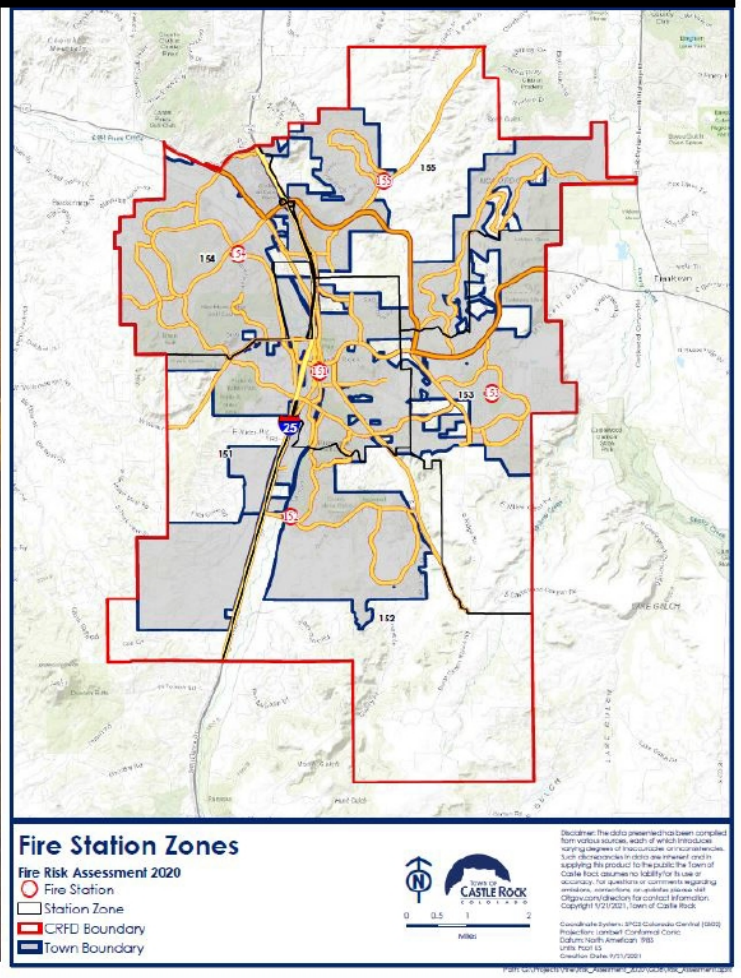
Castle Rock Fire and Rescue Department

2021 Community Risk Assessment



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2021 Risk Assessment

Castle Rock Fire and Rescue Department

Fire Chief Norris Croom III

Deputy Chief Rich Martin

Division Chief/Fire Marshal Brian Dimock

Battalion Chief Jason Butts

Assistant Chief Craig Rollins

Deputy Fire Marshal Rick Young

Lieutenant Brett Johnson

Lieutenant Clay Kallweit

Lieutenant Michael Moore

Engineer Steve Patik

Engineer Chad Wachs

Engineer Todd Lewis

Fire Fighter / Paramedic Stephen Coffin

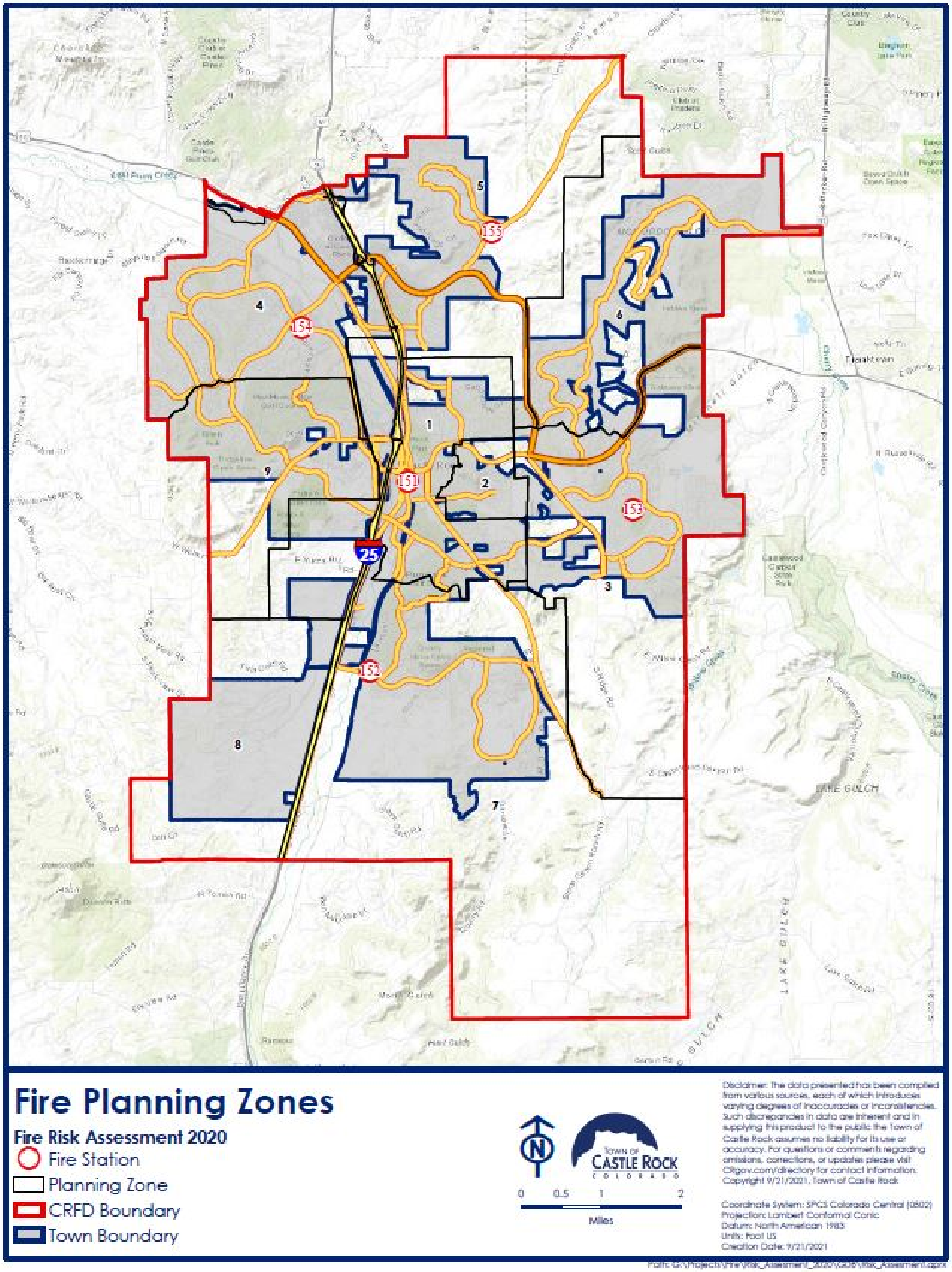
Fire Fighter / Paramedic Kevin Travis

Fire Fighter / EMT Caleb McNeil

Fire Fighter / EMT Mark Ryan

Ben Aldridge / GIS Analyst

Castle Rock Fire and Rescue Planning Zone Map



2021 Risk Assessment

Executive Summary

The Castle Rock Fire and Rescue Department (CRFD) completed this Community Risk Assessment as part of the Commission on Fire Accreditation International's (CFAI) Standards of Cover (SOC) process. This document is a comprehensive analysis of each emergency response service (fire suppression, hazardous materials, emergency medical services, technical rescue, and wildland fire suppression) and the inherent risk(s) within the Castle Rock Fire and Rescue's jurisdiction. Castle Rock Fire and Rescue Department provides service to two authorities and 66 square miles, the Town of Castle Rock (34 square miles) and the Castle Rock Fire Protection District (32 square miles). The Department maintains five fire stations, nine station planning zones (possible future station areas), and 58 fire management zones (FMZ). This risk assessment evaluates the risks within each of the nine station planning zones to determine the maximum risk for each emergency service provided.

To evaluate risk, the team reviewed multiple aspects for each service category, including, but not limited to, historical response data, geographic information systems (GIS) data, and local topography/fuel models. Upon identifying each service risk, they were ranked to determine the risk within a given station planning zone. To define risk, the Department used the following model;

Risk will be defined as:		
Low	Low Probability	Low Impact
Moderate	High Probability	Low Impact
High / Significant	Low Probability	High Impact
Maximum / Special	High Probability	High Impact

The maximum risk could be any risk category depending on the station planning area and various contributing factors. "special" risks may not fall within the strict assessment criteria and are defined as a risk with extenuating circumstances (previous significant incidents, community or cultural significance, impact on the department/Town's ability to provide services, etc.). Below are summaries of the maximum risk for each station planning zone.

	Station Planning Zone 1
Fire	Ecclesia
EMS	24-Hour Care Facilities (multiple)
HAZMAT	AmeriGas
Tech Rescue	Rock Park *(rope rescue)*
Wildland	Very High Risk: Woodlands, Escavera, Caig & Gould, Glover, & Castle Grove neighborhoods

	Station Planning Zone 2
Fire	Valley House Assisted Living
EMS	Valley House Assisted Living
HAZMAT	Residential and roadway
Tech Rescue	Memmen Ridge *(remote access rescue)*
Wildland	Very High Rish: areas adjacent to Memmen Ridge

	Station Planning Zone 3
Fire	Mesa Middle School
EMS	Educational Facilities
HAZMAT	Mitchell Creek Lift Station
Tech Rescue	State Highway 86 *(extrication)*
Wildland	High Risk: Founders Village, Castlewood Ranch, The Oaks, and Castle Ridge

	Station Planning Zone 4
Fire	Castle Rock Hospital
EMS	24-Hour Care Facilities (multiple)
HAZMAT	Castle Rock Hospital
Tech Rescue	Ridgeline Open Space *(remote access rescue)*
Wildland	High Risk: The Meadows, The Pine, and Castle Villas

2021 Risk Assessment

	Station Planning Zone 5
Fire	Silver Heights Skilled Nursing and Rehabilitation Center
EMS	24-Hour Care Facilities (multiple)
HAZMAT	Silver Heights Water and Sanitation
Tech Rescue	HWY 86/Founders Parkway *(extrication)*
Wildland	Very High Risk: Diamond Ridge, Timber Canyon, and Pinion Soliel

	Station Planning Zone 6
Fire	Sage Canyon Elementary
EMS	Private Residences and motor vehicle accidents
HAZMAT	State Highway 86
Tech Rescue	HWY 86/Founders Parkway *(extrication)*
Wildland	High Risk: The Terrian & Cobblestone Ranch neighborhoods

	Station Planning Zone 7
Fire	Direct TV & Pan Sat
EMS	24-Hour Care Facilities (multiple)
HAZMAT	Direct TV & Pan Sat
Tech Rescue	I-25 East Frontage Road *(extrication)*
Wildland	High Risk: Crystal Valley Ranch & portions of Plum Creek neighborhoods

	Station Planning Zone 8
Fire	Remote residential structures
EMS	Private Residences and motor vehicle accidents
HAZMAT	Interstate I-25 & West Frontage Road
Tech Rescue	I-25 West Frontage Road *(extrication)*
Wildland	Keene Ranch, Yucca Hills, and Tiwn oaks neigborhoods

	Station Planning Zone 9
Fire	24-Hour Care Facilities (multiple)
EMS	24-Hour Care Facilities (multiple)
HAZMAT	Douglas County School RE1
Tech Rescue	Miller Activity Complex *(rope rescue)*
Wildland	High Risk: Red Hawk, Castle Highlands, and portions of The Meadows neighborhoods

In addition to identifying the maximum risk by service type and station planning zone, the team made four recommendations. Two of these recommendations will ensure the department risk assessment remains current with the risks in the community. One will ensure that responding personnel have readily available access to pertinent building and safety information for the high-risk facilities. The last recommendation will proactively mitigate risk throughout the jurisdiction.

- Actively participate with other Town departments in the development and planning phases to ensure and plan for fire and emergency responses
- Consider an expanded hazardous materials commodity flow study that provides a more comprehensive overview of the materials being transported through the jurisdiction.
- Develop a sustainable methodology to ensure all new and updated commercial occupancies are evaluated using the current assessment model (OVAP) and ensure significant or special risks facilities are easily identified for response personnel.
- Consistent with 2020 – 2024 Strategic Goal 2020-03, develop, adopt, and implement a Community Wildland Protection Program (CWPP)

2021 Risk Assessment

Table of Contents

2021 Risk Assessment

1. Introduction

Purpose

The Community Risk Assessment aims to define, identify, and, if possible, quantify the risks to the community, the Department, and the Town. This document will identify, in detail, risks related to each of the department's five service categories: Fire Suppression, Emergency Medical Services, Hazardous Materials, Technical Rescue, and Wildland-Urban Interface. Responses to each risk type and magnitude are discussed in the Department's Standards of Cover document. The Town's natural and man-made hazards are detailed in the Town of Castle Rock Emergency Operations Plan.

Jurisdiction

The Castle Rock Fire and Rescue Department is a full-service, career organization protecting the life and property of the TCR (34 square miles with approximately 78,000 residents) and the Castle Rock Fire Protection District (CRFPD) (32 square miles with approximately 2,500 residents). The jurisdiction is divided into nine station planning zones (PZ) for planning, analysis, and reporting. Each PZ covers a theoretical station area assuming the Town and Fire Protection District have reached full build-out. Currently, five fire stations provide coverage for the nine PZs.

PZ1 covers 6.0 square miles with an estimated population of 10,804 (population density 1,798/mile^2), and is 81.7% residential, 17.3% commercial, and 0.9% agricultural. PZ1 contains roughly 33% of the commercial square footage in the justification. PZ1 has 79 center lane miles. PZ1 includes the historic Downtown area, Craig & Gould, Young American, Plum Creek, and The Woodlands neighborhoods and a section of railroad that runs parallel to Perry St. and a portion of Interstate 25 with two access points (exits 181, 182). Buildings in this PZ vary dramatically in their age (from late 1800s to current), construction and protection systems, and residences have a median home value of $472,944. The average household income in PZ1 is $97,981. Additionally, there are an estimated 291 households below the national poverty level and 945 households with at least one person with a disability. PZ1 includes two high schools, three elementary schools, two multi-story senior facilities, two assisted living facilities, one skilled nursing center, seven multi-family condos/apartment complexes, and 19 churches.

PZ2 is the smallest of the PZs at 0.9 square miles with an estimated population of 1,893 (population density 1,893/mile^2), and is 99.4% residential, 0.2% commercial, and 0.4% agricultural. PZ2 contains less than 1% of the commercial square footage in the justification. PZ2 has 7 center lane miles. PZ2 covers Homestead Village, Aspen Grove Condos, and the Winrock Apartments. The houses are of earlier construction (late 70's to the early 2000s) with a median home value of $452,439. The average household income in PZ2 is $105,697. Additionally, there are an estimated 40 households below the national poverty level and 135 households with at least one person with a disability. PZ2 also includes one elementary school, one multi-story senior facility, four churches, and two condo/apartment complexes.

PZ3 covers 9.4 square miles with an estimated population of 13,895 (population density 1,485/mile^2), and is 97.6% residential, 0.7% commercial, and 1.6% agricultural. PZ3 contains roughly 2% of the commercial square footage in the justification. PZ3 has 80 center lane miles. PZ3 includes Founders Village and Castlewood Ranch neighborhoods as well as a section of State Highway 86. The construction in PZ3 is typical construction from the mid 1970's to current lightweight methods with a median home value of $427,941. The average household income in PZ3 is $128,193. Additionally,

there are an estimated 127 households below the national poverty level and 528 households with at least one person with a disability. PZ3 has one middle school, two elementary schools, and four churches.

PZ4 covers 5.7 square miles and is the Department's most populous PZ with an estimated of 19,998 (population density 3,533/mile^2) and is 92.3% residential, 7.5% commercial, and 0.1% agricultural. PZ4 contains roughly 36% of the commercial square footage in the jurisdiction and has 104 center lane miles. PZ4 includes The Meadows and The Pines at Castlegate neighborhoods. Additionally, this zone contains major retail areas within the Town: The Promenade and Outlets at Castle Rock. The residential construction in PZ4 is primarily lightweight, most homes built within the last 15 - 20 years with a median home value of $453,540. The average household income in PZ4 is $130,420. Additionally, there are an estimated 162 households below the national poverty level and 730 households with at least one person with a disability. PZ4 has three elementary schools, one middle school, one high school, Castle Rock Adventist Health Campus, The Outlets at Castle Rock, the Douglas County Justice Center, one large multi-story senior facility, several single-story senior facilities, four churches, portions of Interstate 25, State Highway 85 and a section of railroad on its eastern boundary.

PZ5 covers 9.0 square miles with and estimated population of 7,704 (population density 855/mile^2) and in 86.5% residential, 10.1% commercial, and 3.4% agricultural. PZ5 contains roughly 16% of the commercial square footage in the justification. PZ5 has 67 center lane miles. PZ5 includes Diamond Ridge, Sapphire Point, Metzler Ranch, Maher Ranch, Brookwood, Silver Heights, and Echo Ridge neighborhoods. Residential construction varies from the 1970s to current lightweight methods, with a median home value of $552,193. The average household income in PZ5 is $166,857. Additionally, there are an estimated 145 households below the national poverty level and 413 households with at least one person with a disability. PZ5 has one elementary school, two multi-story senior care facilities, several "big box" retail stores, portions of Interstate 25, State Highway 86.

PZ6 covers 6.9 square miles with and estimated population of 7,270 (population density 1054/mile^2) and is 92.5% residential, 0.2% commercial, and 7.4% agricultural. PZ6 contains less than 1% of the commercial square footage in the justification. PZ6 has 39 center lane miles. PZ6 includes Castle Oaks, Terrain, Liberty Village, and Cobblestone Ranch neighborhoods. The construction in PZ6 is primarily lightweight, with most homes built within the last 15 - 20 years with a median home value of $530,395. The average household income in PZ6 is $159,481. Additionally, there are an estimated eight households below the national poverty level and 294 households with at least one person with a disability. PZ6 has one elementary school and is bordered to the south and west by State Highway 86 and east by State Highway 83.

PZ7 covers 17.8 square miles with an estimated population of 8,075 (population density 454/mile^2) and is 93.5% residential, 3.3% commercial, and 3.2% agricultural. PZ7 contains roughly 4% of the commercial square footage in the justification. PZ7 has 95 center lane miles. PZ7 includes Crystal Valley Ranch, Heckendorf Ranch, The Lanterns, Ditmars Ranch, Bell Mountain Ranch, and Stone Cañon Ranch neighborhoods. The residential construction varies greatly from typical 1970's construction to current lightweight methods with a median home value of $714,113. The average household income in PZ7 is $188,045. Additionally, there are an estimated 30 households below the national poverty level and 347 households with at least one person with a disability. PZ7 is largely residential with one notable exception, a large satellite communication facility in the far southwest corner of the PZ. PZ7 is bordered to the west by a section of railroad running parallel to the east

frontage road of Interstate 25. The Department has been monitoring growth in this PZ, and tracking performance. The Department has recognized that it cannot meet its established baselines in the most populated areas of PZ7.

PZ8 covers 5.3 square miles with an estimated population of 243 (population density 46/mile^2) and is 24.5% residential, 0.5% commercial, and 75.1% agricultural. PZ8 has 15 center lane miles. PZ8 is largely undeveloped, covering Twin Oaks, Yucca Hills, and portions of Keene Ranch, both within unincorporated Douglas County. Yucca Hills has older homes and various lot sizes. Keene Ranch has larger, higher-priced homes on a minimum of 5 acre lots. Keene Ranch is a shared response area with Jackson 105 Fire, a mostly volunteer agency to the west, and Larkspur Fire Department to the south. Additionally, to access Keene Ranch, CRFD units must leave the jurisdiction before they can make entry into the neighborhood. PZ8 also contains a section of railroad that runs parallel to the west frontage road for Interstate 25. The median home value in PZ8 is $939,815. The average household income in PZ8 is $232,842. Additionally, there are an estimated 0 households below the national poverty level and 13 households with at least one person with a disability.

PZ9 covers 4.6 square miles with an estimated population of 8,114 (population density 1,760/mile^2) and is 96.2% residential, 2.6% commercial, and 1.2% agricultural. PZ9 contains roughly 9% of the commercial square footage in the justification. PZ9 has 37 center lane miles. PZ9 includes the Red Hawk, Castle Highlands, Castle Meadows, and the Reserve at Castle Highlands neighborhoods. The construction in PZ9 is primarily lightweight, with most homes built in the last 15-20 years with a median home value of $530,704. The average household income in PZ9 is $146,281. Additionally, here are an estimated 62 households below the national poverty level and 607 households with at least one person with a disability. PZ9 includes one elementary school, one large senior facility, a large multi-use indoor/outdoor recreation center and miles of soft-surface recreational trails. For several years, this PZ has met the minimum call volume requirements to consider a new fire station. However, given that the response times for the first arriving unit and effective response force are within the annually established baselines, the Department has elected not to build a fire station in this area yet. The Department will monitor call volume and performance quarterly and annually to identify trends that could negatively affect the residents in this area.

Station 151 is located in the historic downtown area of Castle Rock with two access points to Interstate I-25 (exits 181, 182). Station 151's district is the 2nd largest within the jurisdiction at 15.1 square miles (22.8%), having approximately 128 center lane miles and an overall population of roughly 13,787 (17.8%) residents. Station 151 maintains primary response coverage for PZ1, PZ2, PZ8, and portions of PZ9. Station 151 has an estimated 5,138 homes with a median home value is $475,172 and an average household income of $101,069. Station 151 has an estimated 358 households below the national poverty level and 1,159 households with at least one person with a disability.

Station 152 is located in the south portion of the jurisdiction. Station152 has the largest of CRFD's station districts at 17.9 square miles (27.0%), having approximately 100 center lane miles, and an overall population of roughly 8,075 (10.4%) residents. Station 152 maintains primary response coverage for PZ7 and northbound I-25 from exit 174 to exit 181. Station 152 has an estimated 1,858 homes with a median home value of $714,113 and an average household income of $188,045. Station 152 has an estimated 30 households below the national poverty level and 347 households with at least one person with a disability.

Station 153 is located within a residential neighborhood on the eastern side of the jurisdiction. Station 153 ‘s district is the 2nd smallest station district at 10.6 square miles (16.3%), having approximately 83 center lane miles and an overall population of roughly 14,276 (18.4%%) residents. Station 153 maintains primary response coverage for PZ3 and part of PZ6. Station 153 has an estimated 3,743 homes with a median home value of $432,629 and an average household income of $128,953. Station 153 has an estimated 128 households below the national poverty level and 552 households with at least one person with a disability.

Station 154 is located in the northwestern portion of the jurisdiction, with two access points to I-25 (exits 184 and 185). Of the five station districts, Station 154 is the smallest in area at 7.9 square miles, with lane miles 128 miles. However, Station 154 is the most populous district, with 27,063 (34.9%) residents. Station 154 maintains primary response coverage for PZ4 and portions of PZ9. Station 154 has an estimated 7,358 homes with a median home value of $470,774 and an average household income of $136,143. Station 154 has an estimated 217 households below the national poverty level and 1,270 households with at least one person with a disability.

Station 155 is located in the northeastern portion of the jurisdiction, centered between several residential neighborhoods and east of Castle Rock’s main retail centers. Station 155 is the 3rd smallest district with respect to area at 14.5 square miles (21.9%), with 103 center lane miles. Station 155 is the thirds most populous area with 14,276 (18.4%) residents. Station 155 maintains primary response coverage for PZ5 and part of PZ6. Station 155 has an estimated 4,152 homes with a median home value of $538,983 and an average household income of $163,673. Station 155 has an estimated 153 households below the national poverty level and 682 households with at least one person with a disability.

Deployment Capabilities

Castle Rock Fire and Rescue Department maintains a minimum daily staffing of 22 firefighters and officers across five fire stations. All CRFD apparatus (suppression and medic units) are ALS capable with at least one paramedic and a full complement of ALS medications and equipment. Minimum staffing on each of the five suppression apparatus is three members; one officer, one engineer (driver/operator), and one firefighter. Minimum staffing on each of the three medic units is two members with at least one paramedic. Daily staffing also includes one battalion chief. Additionally, each station houses at least one cross-staffed apparatus. A cross-staffed apparatus requires the crews to respond in equipment other than their primary vehicle, leaving the primary vehicle out of service.

Table 1.1

	Daily Staffing (minimum)				
	Suppression Apparatus	Medic	Battalion Chief	Cross-Staffed Units	Daily Staffing
Station 151	Quint 151 4 (3)	Medic 151 2 (2)	BA151 1 (1)	Brush 151	7 (6)
Station 152	Engine 152 3 (3)	N/A	N/A	Brush 152 Tracked Rescue Vehicle	3 (3)
Station 153	Engine 154 4 (3)	Medic 153 2 (2)	N/A	Brush 153 HazMat 153	6 (5)
Station 154	Engine 154 3 (3)	Medic 154 2 (2)	N/A	Brush 154	5 (5)
Station 155	Quint 155 4 (3)	N/A	N/A	Brush 155 Squad 155 Collapse 155 Air/Light Trailer	4 (3)

	18 (15)	6 (6)	1 (1)	0	25 (22)

As defined in the Standards of Cover (SOC), the department completed a critical task analysis (CTA) that evaluated each incident type and identified the critical tasks needed to mitigate an incident and the number of personnel required to complete those tasks. Through a compliance team comprised of members from each rank and shift, the department reviews call for service by type to determine the department's compliance to and effectiveness of established CTAs. Outcomes of the compliance team could include changes to the CTA and department response plans.

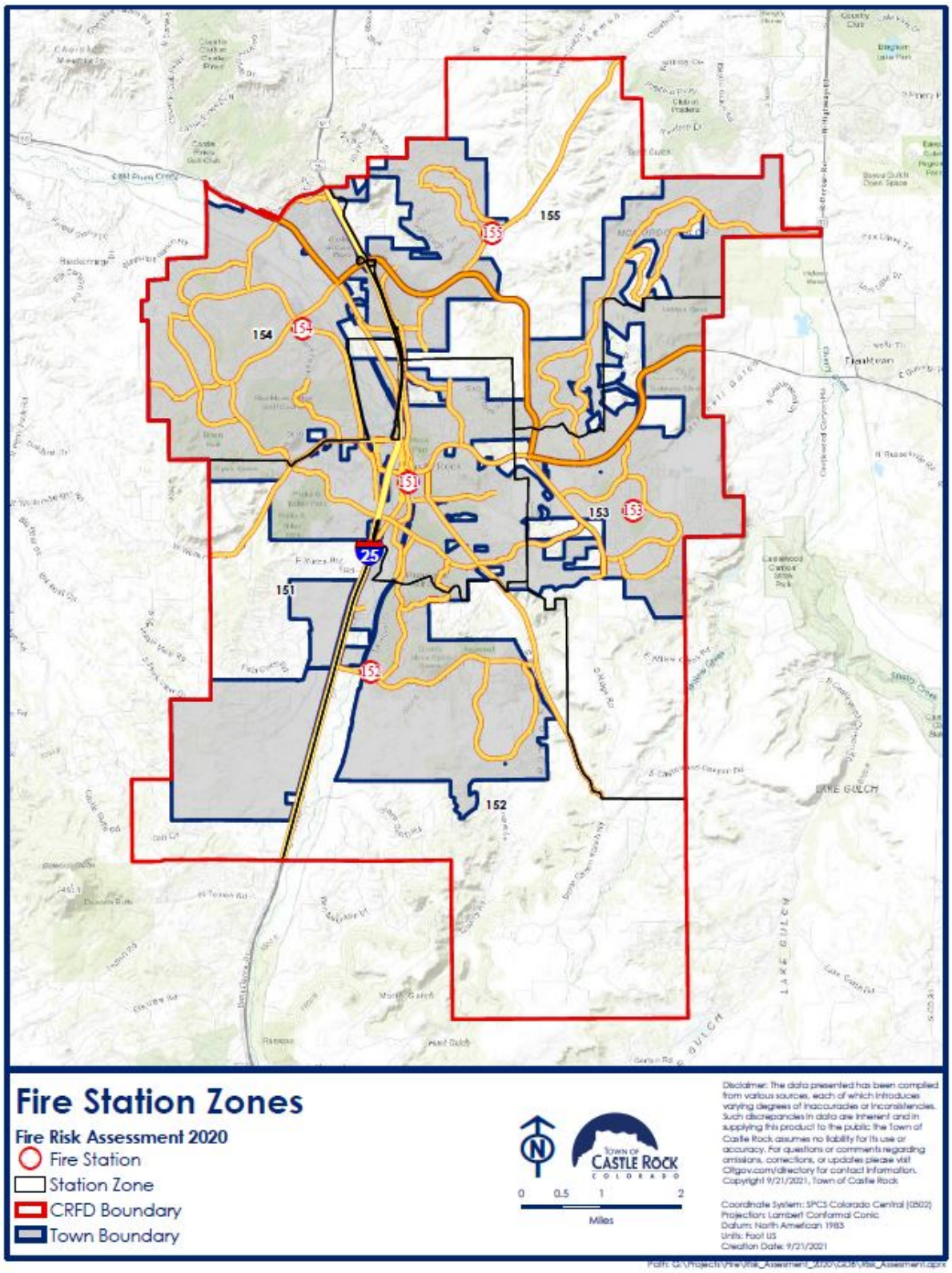
Based on the latest CTAs, if all units are available, Castle Rock Fire and Rescue Department is capable of responding to and mitigating;

- Three simultaneous medical incidents
- Three motor vehicle collisions, no extrication required
- One single motor vehicle collision with extrication and one non-CPR medical incident
- One single alarm residential structure fire and one non-CPR medical incident
- One single alarm commercial structure fire
- One single alarm wildland-urban interface fire (non-red flag day) and one non-CPR medical incident

Even with all units available, Castle Rock Fire and Rescue Department requires mutual aid for either personnel or equipment to respond to and mitigate:

- Any complex technical rescue incident
- Any complex hazardous materials incident
- Any wildland fire on a red-flag day (automatically adds a second alarm)
- Any second alarm or greater fire incident (residential, commercial, or wildland)

Map 1.1 Fire Station Deployment



Automatic and Mutual Aid Agreements

Castle Rock Fire and Rescue Department maintains several mutual and automatic aid agreements. These agreements are reviewed annually by CRFD Executive staff to ensure each agreement is current and valid.

- Larkspur Fire Protection District – Automatic Aid
- Jackson 105 Fire Protection District – Automatic Aid
- Franktown Fire Protection District – Automatic Aid
- South Metro Fire and Rescue Authority – Automatic Aid
- Front Range Mutual Aid Agreement
- Douglas County Mutual Aid Agreement

Total Population and Population Density

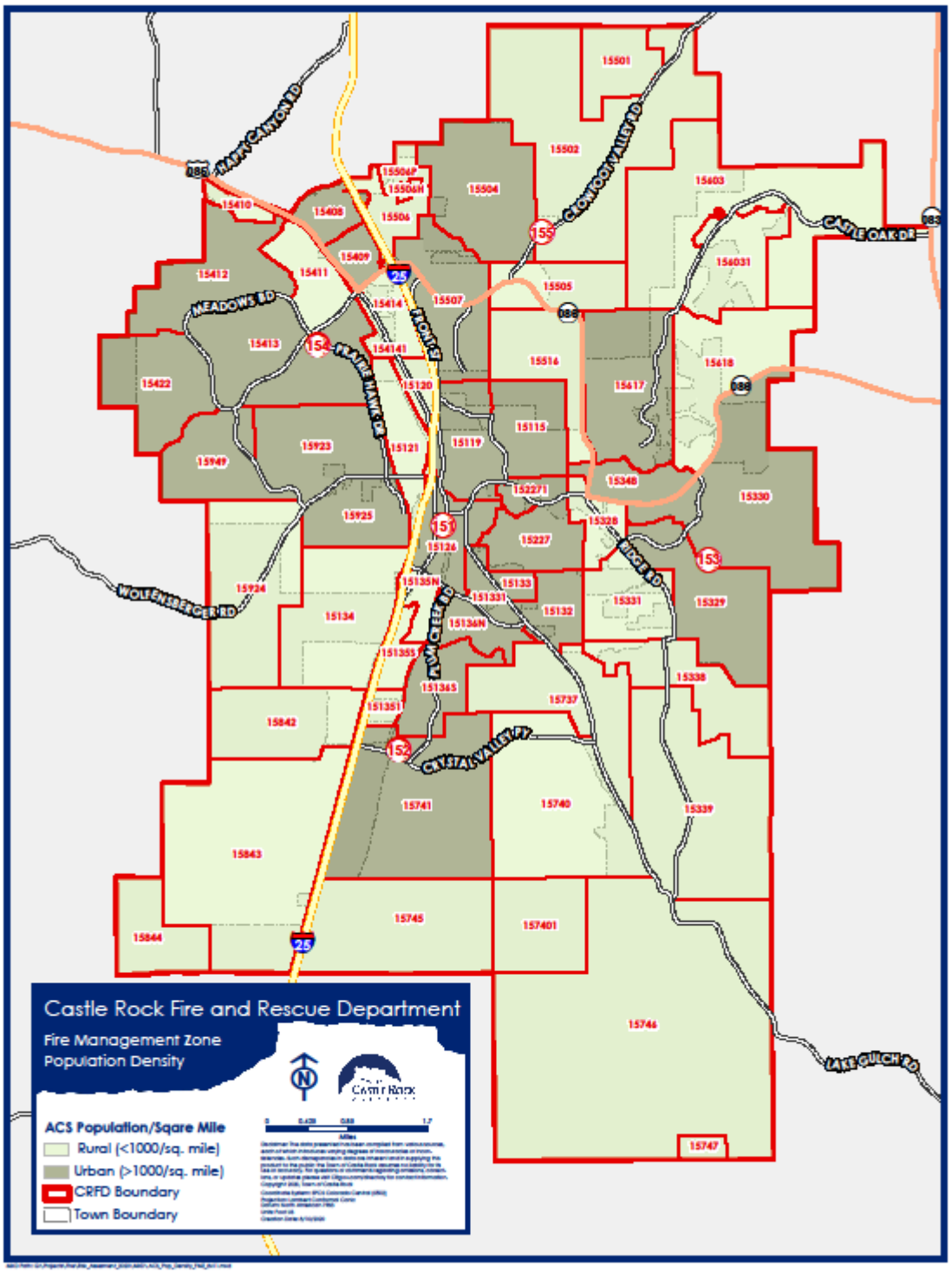
CRFD provides fire and emergency services to an estimated 80,500 residents within a 66 square mile jurisdiction, with an overall population density of 1,220 residents/mile^2. Consistent will all previous versions of the risk assessment and standards of cover, CRFD defines population densities as follows:

Rural: Less than 1,000 residents/mile^2

Urban: Greater than 1,000 residents/mile^2

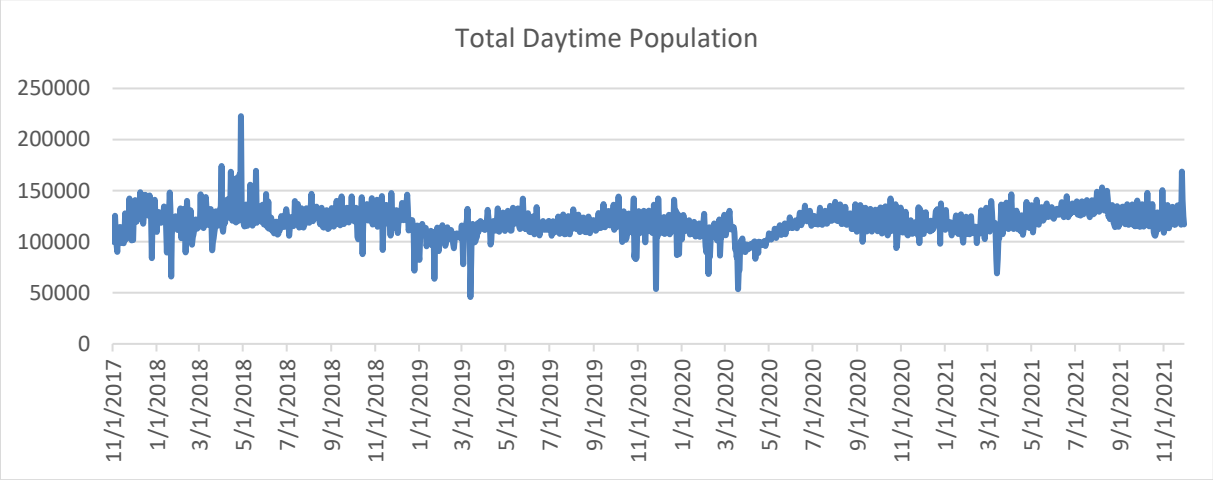
Overall, CRFD's jurisdiction is considered urban with more than 1,000 residents/mile^2. However, CRFD's jurisdiction is divided between the Town of Castle Rock (TCR) and the Castle Rock Fire Protection District (CRFPD). The Town of Castle Rock's Development Services maintains an annual estimate of the resident population for the 34 square miles of the Town of Castle Rock. As of December 2020, the population within town limits is 78,000. The population density for the Town is 2,364/mile^2 and is considered an urban population density. The Castle Rock Fire Protection District represents the remaining 32 square miles of CRFD's jurisdiction and has an estimated population of 2,500 residents. CRFPD's population density is 76 residents/mile^2 and is considered a rural population density. Furthermore, the population is concentrated in neighborhoods throughout the jurisdiction resulting in pockets of higher population densities. Therefore, CRFD has determined the population density within each of the 58 fire management zones (FMZ) and assigned a density value of rural or urban as appropriate. The Department has established performance guidelines for the rural and urban population densities. These performance guidelines are monitored monthly and revised annually or as needed.

Map 1.2 Population Density Map



Daily Population Fluctuation and Highways

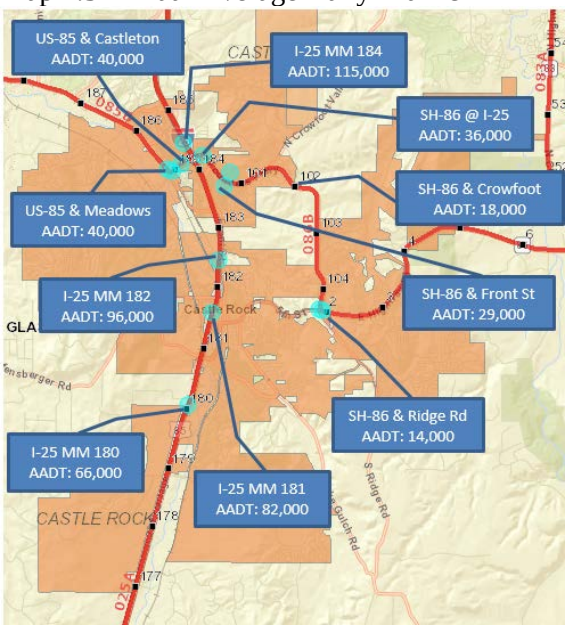
In December 2021, the department completed a Daytime Population Study that examined several influences leading to an increased daily population. The department used a fee-for-service web-based analysis tool, Placer.ai, to estimate Castle Rock's daytime population. The analysis date range was from 11/1/2017 through 11/29/2021 and was selected to span the greatest date range available and minimize recent effects of the COVID pandemic. The filters applied to the date range included all population groups (resident, visitor, and employee). The time frame is similar to Castle Rock's peak call volume time frame of 08:00 and 20:00 (8AM – 8PM). The daily average is calculated and displayed in the chart below.



Based on this analysis, Castle Rock's estimated daytime population is 118,010, or 147% of the resident population with an estimated daytime surge of 37,510. The minimum value of 45,852 correlates with a significant blizzard in the spring of 2019. The maximum value of 222,863 value does not appear to correlate to any known event(s).

Additionally, CRFD has one interstate (I-25) and two state highways (US-85, SH-86) within its jurisdiction. While the vehicles traveling on these roads may or may not be residents of Castle Rock, CRFD must respond to all types of emergencies on these thoroughfares. Based on the Department's 2021 Daytime Population Study, the annual average daily traffic (AADT) maximum traffic count is approximately 115,000 vehicles per day (map 1.3). Compared to data collected from 2007, there has been a total increase in traffic of 19%. Peak travel hours for Interstate 25, US Highway 85, and State Highway 86 are 05:00 through 22:00 (5AM – 10PM).

Map 1.3 Annual Average Daily Traffic



Demographics

Overall, Castle Rock is a young, well-educated, and affluent community with U.S. News ranking Douglas County the 9th richest county in the United States[1] (Forbes, 2015). As seen in Table 1.2[2], the median age in Castle Rock is 35.8, which is younger than the Douglas County, State of Colorado, and National median ages of 38.7, 36.7, and 38.1 respectively, with 48.8% male and 51.2% female. Further analysis shows that Castle Rock's senior population, 65 years and older, is 10.0%. This is lower than the Douglas County, State of Colorado, and National averages of 11.4%, 13.8%, and 15.6%, respectively. However, this is a significant increase from the 2016 data that showed Castle Rock senior population at 6.2%. The youth populations, under 5 years and under 18 years, are higher than the County, State, and National averages.

Table 1.2	Castle Rock	Douglas County	Colorado	United States
Median Age (years)	35.8	38.7	36.7	38.1
Under 5	7.5%	5.9%	6.0%	6.1%
Under 18	28.8%	26.6%	22.5%	22.6%
18 – 64 years	61.2%	62.0%	63.7%	61.8%
65 Years and Older	10.0%	11.4%	13.8%	15.6%
Male	48.8%	50.0%	50.4%	49.2%
Female	51.2%	50.0%	49.6%	50.8%

When compared to state and national statistics, Castle Rock (Table 1.3) is a relatively homogenous demographic, with 83.8% percent of the population identifying as White, 10.3% as Hispanic or Latino, 2.7% Two or More Races, 1.8% Asian, 1.1% as Black/African American, 0.4% American Indian/Native Alaskan, and .02% as Native Hawaiian/Pacific Islander.

Table 1.3	Castle Rock	Douglas County	Colorado	Unites States
White	91.4%	89.5%	86.9%	76.3%
White alone, not Hispanic or Latino	83.8%	81.3%	67.7%	60.1%
Hispanic or Latino [a]	10.3%	9.1%	21.8%	18.5%
Two or More Races	2.7%	2.8%	3.1%	2.8%
Asian alone [b]	1.8%	5.4%	3.5%	5.9%
Black or African American [b]	1.1%	1.7%	4.6%	13.4%
American Indian and Alaskan Native [b]	0.4%	0.5%	1.6%	1.3%
Native Hawaiian and Other Pacific Islander [b]	0.2%	0.1%	0.2%	0.2%
Note a: Hispanic may be of any race, so also are included in applicable race categories				
Note b: Includes persons reporting only one race				

The Town of Castle Rock exceeds the state and national averages (Table 1.4) with respect to education for residents that are 25 years or older[3].

Table 1.4	Castle Rock	Douglas County	Colorado	United States
Less than 9th grade	0.9%	0.5%	3.2%	4.8%
9th to 12th grade, no diploma	2.1%	1.6%	4.4%	6.6%
High school graduate (includes equivalency)	15.0%	12.5%	21.0%	26.9%
Some college, no degree	24.5%	19.4%	20.3%	20.0%
Associate's degree	9.8%	7.9%	8.4%	8.6%
Bachelor's degree or higher	30.3%	36.2%	26.6%	20.3%
Graduate or professional degree	17.5%	21.9%	16.0%	12.8%

[1] U.S. News: 15 Richest Counties in the U.S., December 11, 2020
[2] U.S. Census Bureau 2019 American Community Survey: ACS Demographic and Housing Estimates
[3] U.S. Census Bureau 2019 American Community Survey: Educational Attainment

Castle Rock's median income in 2019[4] was $115,543, significantly higher than both state and national medians of $77,127 and $65,712, respectively, but lower than the Douglas County median of $122,867. The median home value in Castle Rock in 2019[5] was $471,200, which was higher than state and national medians of $394,600 and $240,500, respectively, but lower than the Douglas County median value of $523,200.

Growth and Development

In the past five years, the Town of Castle Rock has seen an increase in all of its growth indicators (Table 1.5). In addition, the growth factors in table 1.5, the Town of Castle Rock experienced a 21% increase in utility accounts. Conservatively, the Town estimates between 700 and 800 new residences per year for the next five years.

Table 1.5	2015	2020		2025 (projected)	
Town Population	59,000	78,500	33%	95,000	21%
Total Business Licenses	1,919	2,137	11%	2,348	10%
Total Lane Miles	613	720	13%	800	11%
Developed Park Acres	331	337	2%	362	7%
Police Calls[6]	9,875	11,092	12%	13,452	21%
Fire/EMS Calls[7]	5,199	5,392	4%	6,498	21%

By 2025, the department estimates the Town of Castle Rock population will reach roughly 98,000 residents, representing a 21% increase. Total lane miles are anticipated to increase by 5-17 miles per year due to residential and commercial growth. Developed park acres are expected to increase by 7% based on current and forecasted projects. The fire/EMS estimate is based on a 10-year average increase of 4.7% per year. The Castle Rock Police Department conservatively estimates a 3% annual increase in call volume based on long-term trending.

[4] U.S. Census Bureau 2019 American Community Survey: Income in the past 12 months (in2019 inflation-adjusted dollars)
[5] U.S. Census Bureau 2019 American Community Survey: Median Value(Dollars)
[6] Priority 1: Immediate and 2: Urgent calls for service only
[7] 2020 Fire and EMS calls for service experienced an 8.2% decrease in calls for service directly attributed to the COVID-19 pandemic and subsequent stay at home orders.

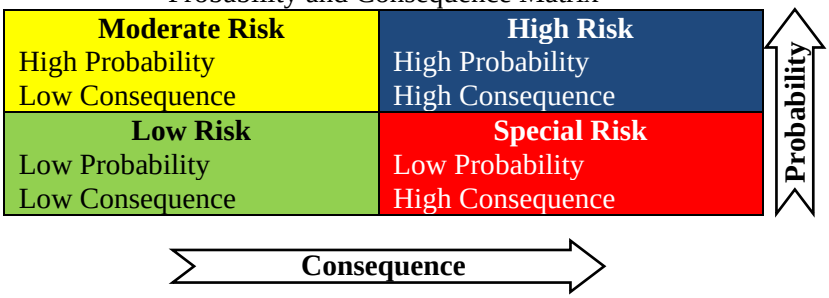
2. Risk Assessment Methodology

In determining the risk for each service category, data from January 1, 2016 through December 31, 2020 was evaluated. The data studied and complied for this report was obtained through several sources, including but not limited to Emergency Integrated Software Inc., Emergency Reporting™, and internal documentation or reports. Data analysis is completed using several systems; exports into MS Excel, StatsFD, Emergency Reporting™ (ER), and Esri ArcMap and ArcGIS Pro.

Using information provided by the Center for Public Safety Excellence, as well as personal experiences, education, and information on risk management from industry experts, the Department has adopted a two-axis risk model defined in table 2.1.

Table 2.1

Probability and Consequence Matrix



For the application of table 2.1, the terms consequence and probability shall be defined as follows;

Consequence: 1) The negative impact of an incident or event on the Department's or Town's short term or long term, ability to provide continuous service to the residents.
2) The negative effect of an incident or event on the cultural, historical, or financial aspects of the Town.

Probability: Based on recent history, the likelihood an incident will occur on any given day.
High Frequency: greater than 95% chance at least one incident will occur on any given day.
Low Frequency: less than 95% chance at least one incident will occur on any given day.

Generally speaking, as the level of risk increases, so should the level of response, i.e. a high risk incident will require more resources (apparatus, equipment, and personnel) than a low risk incident. This frequency/risk table follows each service type's risk assessment.

Fire Risk Methodology

All existing commercial occupancies are evaluated using the Occupancy Vulnerability Assessment Profile (OVAP), established in the ER Vision module. Each occupancy receives an initial OVAP during the final building inspection and is updated during subsequent life safety inspections. If there are multiple occupancies within a single building, the highest OVAP is assigned to the core/shell occupancy ID. ER provides four OVAP risk levels. As shown in table 2.2, CRFD includes a fifth risk level, Special Risk. A special risk is not defined by a numerical score but rather represents a historical,

cultural, or otherwise irreplaceable aspect within the community or poses a significant operational challenge (i.e. insufficient water supply, type of construction, or a high life safety risk). Additionally, a special risk could also be based on previous experience/incidents or aspects that the OVAP does not consider. Unfortunately, ER does not include an option for Special Risk, so this designation is independent of ER. To ensure maximum awareness and dissemination of information, each special-risk occupancy has been entered into First Due (CRFD's pre-plan tool) with a premise warning (red triangle with an exclamation mark) to indicate a special hazard.

Table 2.2 Fire Risk Levels

Risk Level	OVAP Range	Number of Occupancies
Low	<15	0
Moderate	15 – 39	1,826
Significant	40 -59	118
Maximum	>60	0
Special	N/A	65
	Total	2009

For commercial occupancies, the needed fire flow is calculated using the International Code Council's 2012, table B105.1 MINIMUM REQUIRED FIRE-FLOW AND FLOW DURATION FOR BUILDINGS (Appendix A).

EMS Risk Methodology

Emergency Medical Services (EMS) incidents represent the majority of CRFD's calls for service at 58% of all calls. Historical call volume, population density, and occupancy type, specifically senior housing and nursing facilities, have shown to be a good indication of the probability of future EMS call volume. It is important to note that motor vehicle collisions (MVC) are included in the EMS category with the exception of those requiring vehicle extrication, which are considered Technical Rescue.

HAZMAT Risk Methodology

As part of the HAZMAT risk assessment, the Department completed a Hazardous Materials Commodity Study in August 2021. This study evaluated all commercial facilities, state, and interstate highways, the local rail system, and any heliport or air-strips within CRFD's jurisdiction. The study identified all Tier II facilities per SARA Title III and established a risk (Low, Ordinary, High, Special) for each facility. The Department has 204 businesses ranging from retail to light industrial that maintain a reportable quantity of materials per SARA Title III, 36 miles of state or interstate highway, 18 miles of railroad, one helipad, and one airstrip. All SARA Title III businesses are inspected annually and rated as Low, Ordinary, High, or Special risks (based on material stored, process hazard, structural concerns, quantity, and/or potential impact to the community or environment).

Table 2.4

Risk Level	Number of Occupancies
Low	96
Ordinary	82
Significant	9
Special	17
Total	204

Technical Rescue Risk Methodology

Technical rescue, defined as building collapse, confined space, vehicle extrication, rope rescue, and ice/water rescue, proves to be a difficult risk to quantify. Calls for service are extremely low for this category, yet represent a significant risk to the patient/victim as well as responders due to the inherent hazards involved. The technical rescue risks are evaluated based on historical call volume by PZ, population density, and topographical features (canyons, rock cliffs, etc.).

The primary risk for building collapse is due to vehicle crashes (vehicle into a building), ignition of a gas leak, or collapse during construction or renovation. There are four fault lines within Douglas County with a maximum projected magnitude of 5.5. There have been no major earthquakes within the Town of Castle Rock or Douglas County.

Confined space risks are found throughout the jurisdiction in water, sewer, and utility areas. For the purpose of this document, the team identified locations within each PZ that require a confined space permit before entering.

Vehicle extrication is possible throughout the jurisdiction. However, the probability increases on the major routes, state, interstate highways, and high-volume intersections.

Rope rescue has two distinct levels of risk, high angle and low angle. High angle rope rescue presents a much greater risk to all persons involved, whereas, low angle rope rescue presents a lower risk to patient/victims and rescuers. The primary distinction between low and high angle rescue is the rope system represents a safety system, not a method of extrication.

Trench rescue is a dynamic risk that changes frequently based on commercial and residential development, in addition to the needed utility and infrastructure work to support a growing community. As such, it is not practical to identify the maximum risk within each PZ.

Water/Ice Rescue risks are seasonally dependent. The team looked at two main areas: still water (ponds) and moving water (streams). In looking at the still water risk, the team identified all perennial and intermittent ponds by PZ. Perennial ponds contain water year-round, regardless of season or recent storm activity. Perennial ponds represent a higher risk than detention ponds and also pose the highest ice rescue risk. Intermittent ponds are typically dry, designed to control stormwater runoff during heavy rain events. Detention ponds are designed to hold a maximum depth of 10 feet in depth during a 100-year storm/event. Risk for all ponds is based on ease of access or position near the Town's existing trail system. High-risk ponds are within 100 feet of a trail system (hard or soft surface). Refer to Table 2.5 for the Pond Risk Matrix.

Table 2.5

Pond Risk Matrix			
Intermittent	Perennial	<100' of Trail	**Risk**
X			**Low**
	X		**Moderate**
X		X	**High**
	X	X	**High**

The same definitions were used for streams. Perennial streams typically flow year-round and intermittent streams only flow during weather events or due to snowmelt. The team evaluated four aspects for streams: intermittent vs. perennial, distance from a trail, stream cross-section, and potential stream velocity. Stream cross-sections greater than .22 (depth-to-width) indicate areas that are narrower with steeper sides. These areas pose the greatest challenge during rescue operations. Stream velocity of

greater than 11 feet per second (fps) also pose significant challnges during rescue operations. Table 2.6 display the stream risk matrix. Intermittent stream not within 100 feet of a trail are low risk. Perennial stream not with 100 feet of a trail are moderatre risk. If any stream is within 100 feet of trail, or has a cross-section of greater than .22, or has a potential velocity greater than 11 fps, the stream is high risk. If any stream meets two or more of the

Table 2.6

Stream Risk Matrix					
Intermittent	Perennial	<100' of Trail	Cross-Section >.22	< 11 fps	**Risk**
X					**Low**
	X				**Moderate**
X	X	X			**High**
X	X		X		**High**
X	X			X	**High**
X	X	Two or more factors			**Special**

Wildland-Urban Interface (WUI) Risk Methodology

The Castle Rock Fire and Rescue Department recognizes that the risk of wildland-urban interface fire is pervasive throughout the region. In an ongoing effort to reduce the risk of wildland-urban interface fires, and in support of both the 2017 and 2020 Community Driven Strategic Plans, the CRFD has partnered with multiple agencies to develop a Community Wildfire Protection Plan (CWPP). When this 2021 Risk Assessment was drafted, the CWPP was still in DRAFT form and pending adoption by the Town of Castle Rock Town Council. Regardless of the adoption of the CWPP, the DRAFT CWPP document contains valuable information and tools that the CRFD can leverage to help reduce the risk of wildland fire incidents within its jurisdiction.

To avoid conflicts and duplication of efforts, the methodologies and processes used in developing the CWPP will serve as the CRFD's risk assessment methodology. The following are excerpts from the DRAFT 2021 CWPP's Residential Hazard Zone and Structural Ignitability Analysis. They provide a brief overview of the methodology and process.

Residential Hazard Zones[8]

For the purposes of this CWPP, areas of residential density inside the town boundary were divided based on wildfire propagation and impacts. The driving factors in these divisions are similarity in risk (the likelihood of an ignition resulting in a damaging fire) and hazard (the severity of fire impacts to life and homes) rather than existing political or HOA neighborhood boundaries. Many of the locally recognized neighborhood and HOA boundaries include undeveloped land and significant areas of natural fuels. These areas are dealt with in the fire behavior analysis. The purpose of dividing the residential areas of the town into hazard zones is to perform a structural ignitability analysis in order to sort residential areas into hazard categories for prioritization of recommendations. This is accomplished by the use of the Wildfire Hazard Rating (WHR) tool, which is intended to analyze WUI development and does not have any applicability to undeveloped land. For

[8] Town of Castle Rock 2021 Community Wildfire Protection Plan (pp. 15-16) -DRAFT-

a further discussion of this methodology see the *Structural Ignitibility Analysis and Recommendations* section of this report.

Areas of Special Interest

In addition to the residential hazard zones, the developed areas of Castle Rock also contain areas of special interest (ASIs). The ASIs include Commercial Zones A through D, Dawson's Ridge, Douglas County Fairgrounds and Open Space parks. Please see the *Areas of Special Interest* section of this report following the *Structural Ignitibility Analysis* section for a discussion of these areas.

Structural Ignitability Analysis[9]

Purpose

The purpose of dividing the residential areas of the town into hazard zones is to perform a structural ignitability analysis to sort residential areas into hazard categories for prioritization of recommendations. This is accomplished by the use of the Wildfire Hazard Rating (WHR) tool, which is intended to analyze WUI development.

Methodology

WHR was developed specifically to evaluate communities within the WUI for their relative wildfire hazard. The WHR model combines physical infrastructure such as structure density and roads, and fire behavior components such as fuels and topography, with the field experience and knowledge of wildland fire experts. It has been proven and refined by use in rating thousands of neighborhoods throughout the United States. Much of National Fire Protection Association Standard 1144 "Standard for Reducing Structure Ignition Hazards from Wildland Fire" (NFPA 1144) has been integrated into this methodology to ensure compatibility with national standards. Additionally, aspects of NFPA 1142 regarding water supply for rural and suburban firefighting are included in the assessments by looking at proximity and capacity of the water supply.

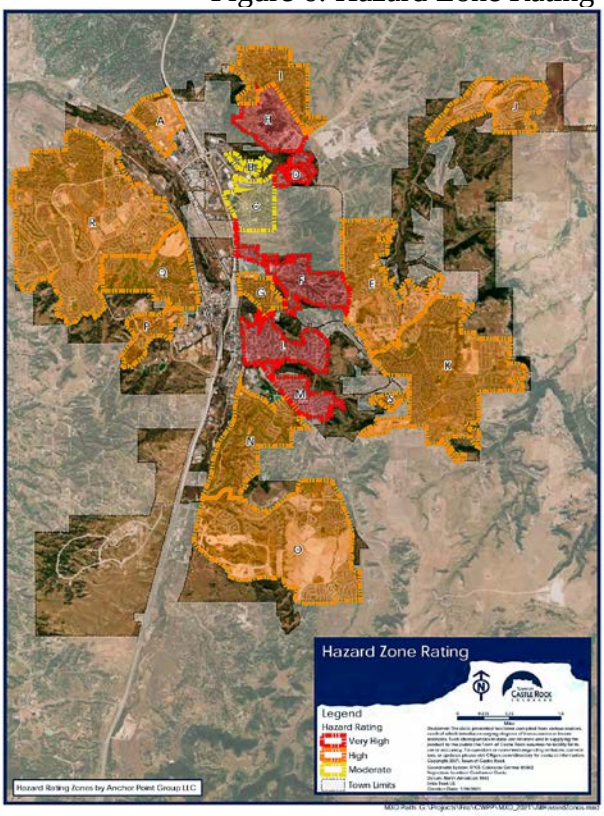
The model was developed from the perspective of performing structural triage on a threatened community in the path of an advancing wildfire with moderate fire behavior. The WHR survey and fuel model ground-truthing are accomplished by field surveyors with WUI fire experience. The rating system assigns a hazard rating based on categories such as topographic position, fuels and fire behavior, construction and infrastructure, suppression factors, and other factors including frequent lightning, railroads, campfires, etc. The rankings are also related to what's customary for the area. For example, a high-hazard area on the plains of Kansas may not look like a high-hazard area in the Sierra Nevada. The system creates a relative ranking of community hazards in relation to the other communities in the study area.

[9] Town of Castle Rock 2021 Community Wildfire Protection Plan (pp. 29-31) -DRAFT-

Introduction

There are 19 residential hazard zones in the study area (see Figure 6). Hazard ratings have been assigned based on five categories: low, moderate, high, very high and extreme. Two zones are rated as moderate, 12 as high and five as very high. Zone A encompasses residential development in the Promenade and Outlets neighborhoods. Zone B includes part of Metzler Ranch. Zone C includes the rest of Metzler Ranch. Zone D includes Timber Canyon and Pinon Soleil. Zone E includes the Castle Oaks and Terrain neighborhoods. Zone F includes The Woodlands and Escavera. Zone G includes Castle North and the northern residential portion of downtown. Zone H includes Diamond Ridge. Zone I includes Maher Ranch (Sapphire Point). Zone J includes Cobblestone Ranch. Zone K includes the Founders Village and Castlewood Ranch neighborhoods. Zone L includes the eastern residential portion of downtown. Zone M includes Young American, Baldwin Park, part of the Memmen Young neighborhood within the city limits and some of the southern residential portion of downtown. Zone N includes the Plum Creek neighborhood. Zone O includes the portions of Crystal Valley Ranch, Heckendorf Ranch and The Lanterns that are within the city limits. Zone P includes Castle Highlands. Zone Q includes Red Hawk. Zone R includes The Meadows and Town Center. Zone S includes the part of Ridge Oaks inside the city limits.

Figure 6: Hazard Zone Rating

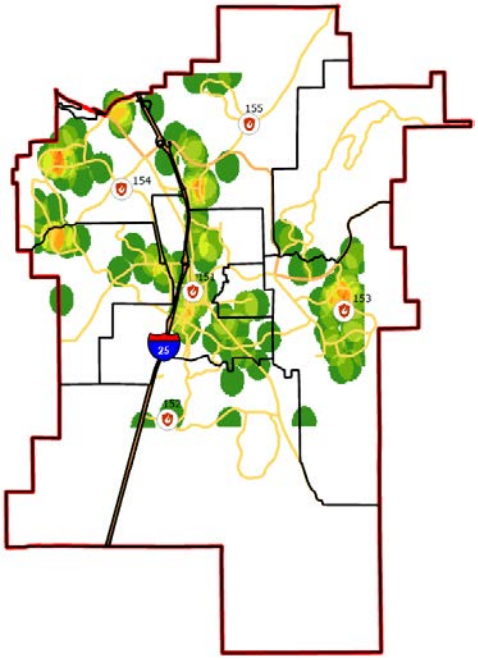


The Town of Castle Rock Town Council adopted the CWPP on January 18, 2022 via resolution 2022-007. The CWPP can be viewed on the Castle Rock Fire and Rescue Departmnet's webiste

3. Fire Risks

The Town of Castle Rock has a very diverse inventory of buildings and construction types that pose various fire risks. There are a number of buildings that were built in the late 1800's and early 1900's, modern homes with light weight construction, several multi-story senior living facilities, several multi-story condo or apartment complexes, large retail complexes, and mixed light industrial facilities. There are residential occupancies in each of the nine PZs. The majority of the industrial occupancies are located in PZs 1 and 9, and the vast majority of retail occupancies are located in PZs 1, 4 and 5.

Map 3.0 Fire Responses



At the jurisdictional level, Castle Rock Fire and Rescue's commercial fire risk is overwhelmingly Moderate with 90.8% of all commercial occupancies scoring between 15 and 39 per the OVAP worksheet, only 115 occupancies score as significant, and zero occupancies score as maximum. There are 69 special risks occupancies. Map 3.1 (Appendix B) shows the distribution of all commercial occupancies and their associated risks throughout the jurisdiction and within each of the nine PZs.

Table 3.1 CRFD OVAP Risk Levels

Risk Level	OVAP Range	Station Planning Zone									
		CRFD	1	2	3	4	5	6	7	8	9
Low	<15	0	0	0	0	0	0	0	0	0	0
Moderate	15 – 39	1,822	787	21	58	548	243	3	59	0	104
Significant	40 -59	115	73	2	0	18	7	2	5	0	8
Maximum	>60	0	0	0	0	0	0	0	0	0	0
Special	N/A	69	26	2	4	12	10	1	4	0	9
Total Occupancies		2006	886	25	62	578	260	6	68	0	121

Given that all fire related incidents are less than a 95% probability, there are no fire risks classified as high frequency. The probability of a low risk fire incident is 52.67%. The probability of a moderate risk fire event is 21.47%. The probability of at least one high risk fire event is 28.96%.

Table 3.2 places each of the 1553 fire-related incidents, from 2016 through 2020, into their relevant risk categories. Of those 1553 incidents, 165 incidents were structure fires (111 residential and 54 commercial structure fires), and of those 165, only 26 incidents received the complete effective response force (nine residential and 17 commercial).

Fire Risk Table 3.2 CRFD Fire Risk

		Fire Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Commercial Fire Alarm (727) Residential Fire Alarm (329) Smoke Investigation Inside (143) Passenger Car Fire (76) Dumpster Fire (28) Lightning Strike (14) Alarm Reset (13 Arching Transformer (11) Fire Other (10) Unattached Building Fire (5)	Residential Structure Fire (111) Commercial Carrier Fire (21) Train Fire (2) Explosion with Fire (0)	Commercial Structure Fire (54)

Station Planning Zone 1: Fire

Planning Zone 1 (PZ1) is 81.7% residential with an urban population density (1,783/mile^2). However, PZ1 contains 44.0% of the jurisdiction's commercial occupancies. Map 3.2 (Appendix B) displays all the commercial occupancies in PZ1. As evident by the map, the bulk of the occupancies are in the Downtown and Park St. / Caprice Dr. areas. PZ1 contains 27 Special Risk (Table 3.3) occupancies and 73 Significant Risk occupancies. PZ1 contains eight schools, three bowstring roofed buildings, each with multiple occupancies, and two 24-hour care facilities.

Between 2016 and 2020, there were three structure fire incidents at either a Significant or Special risk occupancy in PZ1 (16-2833, 20-0923, and 20-2586). These three incidents resulted in zero injuries or fatalities, and no dollar loss was reported. The residential fire risk in this area varies from late 1800's construction to current lightweight construction.

The single greatest fire risk in PZ1 is the Ecclesia building at 221 N Perry St. The building is classified as a Special Risk and poses numerous complications due to its balloon frame construction, occupancy type with multiple independent kitchen areas, and historical community value. This building houses several eating and drinking establishments that draws a larger number of people. However, during recent renovations, this occupancy has been updated to include a centrally monitored fire alarm and sprinkler system.

Table 3.3 Special Risk PZ1		
Special Risk		
Address	OVAP	Reason for "Special" rating
221 N Perry St	54.4	Building Construction: Balloon Frame
414 N Wilcox St	53.7	Building Construction: Bowstring
415 N Perry St	51.2	Building Construction: Balloon Frame
420 Elbert St	47.3	Cultural
807 N Wilcox St	47.2	Building Construction: Bowstring
403 N Wilcox St	46.4	Building Construction: Multiple roofs
1225 S Gilbert St	45.2	Water Supply
1110 Eaton Cr	45.1	Water Supply
404-410 Jerry St	43.6	Building Construction: Bowstring
2693 N Front St	42.0	Life Safety: School
105 N Wilcox St	41.9	Building Construction: Bowstring
221 N Cantril St	39.9	Life Safety: 24-Hour Care Facility
1871 Park St	39.6	Water Supply
403 N Perry St	37.2	Life Safety: Senior housing
190 S Wilcox St	37.2	Water Supply
740 N Wilcox St	36.3	Building Construction: Multiple roofs

1055 S Perry St	36.3	Life Safety: 24-Hour Care Facility
607 S Gilbert St	33.9	Water Supply
1103 Canyon Dr	33.6	Life Safety: School
1297 S Perry St	33.5	Life Safety: 24-Hour Care Facility
240 N Wilcox St	33.0	Building Construction: Bowstring
100 S Wilcox St	32.5	Cultural
312 N Cantril St	28.4	Life Safety: School
961 Plum Creek Blvd	27.3	Life Safety: School
2842 N Front St	22.8	Life Safety: School

PZ1 was the second most active PZ with respect to fire related incidents between 2016 and 2020 with 386 or 24.9% of all fire incidents as shown in Table 3.4. Of the fire incidents in PZ1, 37 were structure fires (18 residential and 19 commercial) that resulted in five ERF arrivals (two residential and three commercial).

Table 3.4 Fire Risk PZ1

		Fire Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Commercial Fire Alarm (218) Residential Fire Alarm (43) Smoke Investigation Inside (39) Passenger Car Fire (12) Dumpster Fire (11) Lightning Strike (6) Alarm Reset (0) Arching Transformer (5) Fire Other 4() Unattached Building Fire (0)	Residential Structure Fire (18) Commercial Carrier Fire (6) Train Fire (1) Explosion with Fire (0)	Commercial Structure Fire (19)

Station Planning Zone 2: Fire

Planning Zone 2 (PZ2) is the smallest of the PZs and is 99.4% residential with an urban population density (1,893/mile^2). However, PZ2 contains 25 (1.2%) commercial occupancies; of those occupancies, two are considered Special Risk, see table 3.6 and map 3.3 (Appendix B) for details. The remaining occupancies are either Significant (2) or Moderate (21). There are two apartment complexes in PZ2, Aspen Grove Condos and Winrock Apartments. The residential fire risk in PZ2 varies from typical construction of the 1970's to early 2000's. PZ2 has a small area that is not serviced by hydrants, however, there are no commercial occupancies in that area. Additionally, for all structure fires in the un-hydrated area, three water tenders are automatically added to the initial response.

Since 2016, there have been no structure fire incidents at either a Significant or Special risk occupancy in PZ2.

The single greatest fire risk in PZ2 is The Valley House, a two story 24-hour senior care facility. While the building is protected with sprinklers, there is a high life hazard and many occupants requiring assistance to evacuate.

Table 3.5 Special / Significant Risk PZ2		
Special Risk		
Address	OVAP	Reason for "Special" rating
255 S Valley Drive	34.7	Life Safety: 24-Hour Care Facility
1100 South Street	30.8	Life Safety: School

PZ2 experienced a relatively low number of fire related incidents from 2016 through 2020 with 47 or 3.0% of all fire incidents as shown in Table 3.6. Of the fire incidents in PZ2, eight were structure fire responses (seven residential and one commercial) that resulted in two ERF arrivals (zero residential and two commercial).

Table 3.6 Fire Risk PZ2

		Fire Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Commercial Fire Alarm (29) Residential Fire Alarm (5) Smoke Investigation Inside (3) Passenger Car Fire (1) Dumpster Fire (0) Lightning Strike (1) Alarm Reset (0) Arching Transformer (0) Fire Other (0) Unattached Building Fire (0)	Residential Structure Fire (7) Commercial Carrier Fire (0) Train Fire (0) Explosion with Fire (0)	Commercial Structure Fire (1)

Station Planning Zone 3: Fire

Planning Zone 3 (PZ3) is 97.6% residential with an urban population density (1,535/mile^2).

PZ3 contains a total of 62 (3.1%) commercial occupancies (Map 3.4, Appendix B). Of those occupancies, there are four Special Risk occupancies, three schools and one care facility (table 3.7). The residential construction is typical construction from the mid 1970's to current lightweight methods.

Since 2016, there have been no structure fire incidents at either a Significant or Special risk occupancy in PZ3.

The single greatest fire hazard in PZ3 is the Mesa Middle School due to its daytime life safety hazard and inclusion in the area critical infrastructure inventory. Of special note**, there is one Special Risk HAZMAT facilities (Ray Waterman Regional Water Treatment Facility) in PZ3 the has a modified structure fire response plan requiring the addition of a Hazardous Materials units as part of the 1st alarm commercial structure fire assignment.

Table 3.7 Special / Significant Risk PZ2		
Special Risk		
Address	OVAP	Reason for "Special" rating
365 Mitchell St	40.9	Life Safety: School
104 Lovington St	36.0	Life Safety: School
400 N Heritage Ave	34.4	Life Safety: School
4680 E State Highway 86	26.1	Life Safety: 24-Hour Care Facility
1282 Castle Oaks Dr**	29.4	HAZMAT

PZ3 experienced a relatively low number of fire related incidents from 2016 through 2020 with 135, or 8.7% of all fire incidents as shown in Table 3.8. Of the fire incidents in PZ3, 26 were structure fire responses (25 residential and one commercial) that resulted in six ERF arrivals (six residential and zero commercial).

Fire Risk Table 3.8

		Fire Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Commercial Fire Alarm (21) Residential Fire Alarm (56) Smoke Investigation Inside (17) Passenger Car Fire (4) Dumpster Fire (2) Lightning Strike (3) Alarm Reset (0) Arching Transformer (2) Fire Other (1) Unattached Building Fire (1)	Residential Structure Fire (25) Commercial Carrier Fire (1) Train Fire (0) Explosion with Fire (0)	Commercial Structure Fire (1)

Station Planning Zone 4: Fire

Planning Zone 4 (PZ4) is 92.3% residential and is the most populous area within the jurisdiction with an urban population density (3,361/mile^2). PZ4 contains 345 (25%) commercial occupancies to include The Outlets at Castle Rock and Castle Rock Adventist Health Campus. Additionally, PZ4 contains The Promenade, one of the nation's largest mixed use (commercial/retail/residential) construction sites. When completed, The Promenade will encompass roughly 1,000,000 square feet of mixed use space. In conjunction with The Promenade and to ease traffic congestion on Meadows Parkway, the Town of Castle Rock partnered with the Colorado Department of Transportation (CDOT) to build Castle Rock Parkway. The project will connect North Meadows Drive with Interstate 25, and includes two bridges and a new exit for I-25. PZ4 contains twelve Special Risk (table 3.9), (Map 3.5, Appendix B). The residential construction in PZ4 is primarily lightweight with the vast majority of the homes built within the last 15 years.

Since 2016, there have been no structure fire incidents at either a Significant or Special risk occupancy in PZ4.

The single greatest fire risk in PZ4 is the Castle Rock Adventist Health Campus at 2350 Meadows Boulevard, a four-story full-service hospital. While the building is protected with sprinklers, there is a high life hazard, and many occupants requiring assistance to evacuate.

Table 3.9 Special Risk PZ4		
Special Risk		
Address	OVAP	Reason for "Special" rating
2350 Meadows Blvd	45.1	Life Safety: Hospital
2131 Low Meadow Blvd	43.4	Life Safety: School
4500 Limelight Ave	41.1	Life Safety: School
4000 Justice Way	40.6	Life Safety: Correctional Facility
738 W Castleton Rd	36.8	Water Supply
2575 Meadows Blvd	36.0	Life Safety: School
4665 Tanglevine Dr	35.8	Life Safety: 24-Hour Care Facility
1855 Low Meadow Blvd	34.1	Life Safety: 24-Hour Care Facility
3700 Butterfield Crossing Dr	33.2	Life Safety: School
3155 N Commerce CT	31.4	Water Supply
5254 N Meadows Dr	30.0	Life Safety: School
2473 Woodhouse Ln	28.8	Life Safety: 24-Hour Care Facility

PZ4 experienced the highest number of fire related incidents from 2016 through 2020 with 463, or 29.8% of all fire incidents as shown in Table 3.10. Of the fire incidents in PZ4, 43 were structure fire

responses (24 residential and 17 commercial) that resulted in eight ERF arrivals (four residential and four commercial).

Fire Risk Table 3.10

		Fire Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Commercial Fire Alarm (270) Residential Fire Alarm (72) Smoke Investigation Inside (41) Passenger Car Fire (7) Dumpster Fire (10) Lightning Strike (1) Alarm Reset (8) Arching Transformer (2) Fire Other (2) Unattached Building Fire (0)	Residential Structure Fire (24) Commercial Carrier Fire (5) Train Fire (1) Explosion with Fire (0)	Commercial Structure Fire (17)

Station Planning Zone 5: Fire

Planning Zone 5 (PZ5) is 86.5% residential with a rural population density (853/mile^2). PZ5 contains 222 commercial occupancies (15%), mostly retail and food service (Map 3.6, Appendix B). PZ5 has seven Special Risk, (two schools and five 24-hours care facilities), and three Significant Risk occupancies (strip malls), table 3.11. The residential construction in PZ5 is primarily lightweight with the vast majority of the homes built within the last 15 years with the exception of the Silver Heights area. Silver Heights is an older community with homes built in the mid-1960's.

Since 2016, there has been one structure fire incident at either a Significant or Special risk occupancy in PZ5. Incident 20-4610 was reported as an outbuilding fire. However, the actual cause of the fire was a warming fire lit by a person experiencing homelessness.

The maximum fire risk in PZ5 is Silver Heights Skilled Nursing and Rehabilitation Center at 4001 Home Street. This is due to number of residents, reduced mobility, and limited access for multiple large apparatus.

Table 3.11 Special Risk PZ5		
Special Risk		
Address	OVAP	Reason for "Special" rating
4001 Home St	40.8*	Life Safety: 24 Hour Care Facility
1746 Wild Star Way	41.5	Life Safety: 24 Hour Care Facility
St815 Tarpan Pl	38.5	Life Safety: 24 Hour Care Facility
3954 Trail Boss Ln	35.7	Life Safety: School
797 Tarpan Pl	31.2	Life Safety: 24 Hour Care Facility
3960 Trail Boss Ln	30.3	Life Safety: school
864 Barranca Dr	24.2	Life Safety: 24 Hour Care Facility

PZ5 experienced the third highest number of fire related incidents from 2016 through 2020 with 242 incidents or 15.6% of all fire incidents as shown in Table 3.12. Of the fire incidents in PZ5, 20 were structure fire responses (11 residential and nine commercial) that resulted in two ERF arrivals (zero residential and two commercial).

Fire Risk Table 3.12

		Fire Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Commercial Fire Alarm (145) Residential Fire Alarm (44) Smoke Investigation Inside (15) Passenger Car Fire (9) Dumpster Fire (3) Lightning Strike (1) Alarm Reset (1) Arching Transformer (1) Fire Other (1) Unattached Building Fire (2)	Residential Structure Fire (11) Commercial Carrier Fire (0) Train Fire (0) Explosion with Fire (0)	Commercial Structure Fire (9)

Station Planning Zone 6: Fire

Planning Zone 6 (PZ6) is 92.5% residential with only six commercial occupancies, an elementary school, in-school daycare, two community pools & clubhouses, and a water treatment facility (Map 3.7, Appendix B). The residential population density is urban (1,054/mile^2). PZ6 has experienced significant growth over the last five years almost doubling the population density from 544/mile^2. PZ6 is regularly monitored for call volume and performance, and will likely receive the next fire station (tentatively planned for 2025).

This PZ is unique in that fire management zone (FMZ) 15603 receives a CRFD response and a mutual aid response due to the proximity and response time of Franktown Fire Protection District Station 184. Additionally, there are certain areas that are not serviced by fire hydrants and receive three mutual aid tenders on the initial response. There are no commercial occupancies in the non-hydranted areas.

Since 2016, there have been no structure fire incidents at either a Significant or Special risk occupancy in PZ6.

The maximum fire risk in PZ6 is Sage Canyon Elementary School, 2420 Autumn Sage St.

Table 3.13 Special Risk PZ6		
Special Risk		
Address	OVAP	Reason for “Special” rating
2420 Autumn Sage St.	39.8	Life Safety: School

PZ6 experienced a relatively low number of fire related incidents from 2016 through 2020 with 51 incidents or 3.3% of all fire incidents as shown in Table 3.14. Of the fire incidents in PZ6, four were structure fire responses (four residential and zero commercial) that resulted in one ERF arrivals (one residential and zero commercial).

Fire Risk Table 3.14

		Fire Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Commercial Fire Alarm (5) Residential Fire Alarm (4) Smoke Investigation Inside (8) Passenger Car Fire (1) Dumpster Fire (1) Lightning Strike (2) Alarm Reset (3) Arching Transformer (0) Fire Other (0) Unattached Building Fire (0)	Residential Structure Fire (4) Commercial Carrier Fire (0) Train Fire (0) Explosion with Fire (0)	Commercial Structure Fire (0)

Station Planning Zone 7: Fire

Planning Zone 7 (PZ7) (Map 3.8, Appendix B) is the largest of the nine PZs at 17.8 mile^2, and is 93.5% residential with a rural population (454/mile^2). The population in PZ7 has nearly doubled since 2016 and continues to experience significant growth. In 2018, the department opened Station 152 to increase coverage and reduce response time in PZ7, formerly split between Stations 151 and 153.

On the southwestern portion of PZ7 is Bell Mountain Ranch. This neighborhood is split between Larkspur Fire Protection District and CRFD with homes on the south side of Bell Mountain Parkway serviced by Larkspur Fire Protection District and CRFD on the north side. The residential construction in this area is predominantly current, lightweight construction. There are some areas that are not serviced by fire hydrants and receive three mutual aid tenders on the initial response.

Since 2016, there have been no structure fire incidents at either a Significant or Special risk occupancy in PZ7.

There are few commercial occupancies in PZ7, however, this PZ contains two of the department's most unique Special Risk occupancies, 5454 & 5281 Garton Road. These facilities are secure satellite facilities with specialized suppression systems at the far southeastern portion of CRFD's jurisdiction. Aside from the Garton Rd addresses, there are two Special Risks occupancies, a school and 24-hour care facility (Table 3.15).

Table 3.15 Special Risk PZ7		
Special Risk		
Address	OVAP	Reason for "Special" rating
2490 S Perry St	33.2	Life Safety: School
5454 Garton Rd.	31.9	Satellite Facility
5858 Point Rider Cr	27.6	Life Safety:24-Hour Care Facility
5281 Garton Rd.	26.3	Satellite Facility

PZ7 experienced a relatively low number of fire related incidents from 2016 through 2020, with 68 incidents or 4.4 % of all fire incidents as shown in Table 3.16. Of the fire incidents in PZ7, seven were structure fire responses (seven residential and zero commercial) that resulted in zero ERF arrivals (zero residential and zero commercial).

Fire Risk Table 3.16

		Fire Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Commercial Fire Alarm (8) Residential Fire Alarm (35) Smoke Investigation Inside (6) Passenger Car Fire (4) Dumpster Fire (1) Lightning Strike (0) Alarm Reset (1) Arching Transformer (0) Fire Other (2) Unattached Building Fire (2)	Residential Structure Fire (7) Commercial Carrier Fire (2) Train Fire (0) Explosion with Fire (0)	Commercial Structure Fire (0)

Station Planning Zone 8: Fire

Planning Zone 8 (PZ8) (Map 3.9, Appendix B) is the least populated planning zone with 24.5% residential occupancies and the rest zoned as agricultural. The vast majority of PZ8 is pasture and an abandon residential project from the late 1980's. The population density for PZ8 is rural (48/mile^2). There are two district population centers in this area; Twin Oaks, Yucca Hills, with older homes and Keene Ranch, with larger higher priced homes in the southern portion of the area. Keene Ranch is a shared response area with Jackson 105 and Larkspur Fire Protection District. Additionally, to access Keene Ranch, CRFD units must leave the jurisdiction, on Tomah Rd, before they can make entry into the neighborhood.

Since 2010, there have been no fire incidents in PZ8. Furthermore, there have been only 38 total incidents in PZ8 between 2011 and 2015.

PZ8 only one fire related incident (fire alarm) from 2016 through 2020. This was 0.1% of all fire incidents as shown in Table 3.26. Of the fire incidents in PZ8, there were zero structure fire incidents.

The maximum fire risk in PZ8 is remote residential structures in non-hydranted areas. These response plans include three automatic aid tenders on any reported fire.

Fire Risk Table 3.17

		Fire Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Commercial Fire Alarm (0) Residential Fire Alarm (1) Smoke Investigation Inside (0) Passenger Car Fire (0) Dumpster Fire (0) Lightning Strike (0) Alarm Reset (0) Arching Transformer (0) Fire Other (0) Unattached Building Fire (0)	Residential Structure Fire (0) Commercial Carrier Fire (0) Train Fire (0) Explosion with Fire (0)	Commercial Structure Fire (0)

Station Planning Zone 9: Fire

Planning Zone 9 (PZ9) (Map 3.10, Appendix B) is 96.2% residential with a urban population density (1,546/mile^2) and a total of 126 commercial occupancies. Of the 126 occupancies, there are nine Special

Risk occupancies (Table 3.18), six of these are 24-hour care facilities, two are schools, and one facility insufficient fire flow based on fire flow calculations found in Appendix A.

Since 2016, there have been no structure fire incidents at either a Significant or Special risk occupancy in PZ9.

For several years this PZ has met the minimum call volume requirements to consider a new fire station. However, given that the response times for the first arriving unit and effective response force are within the annually established baselines, the Department has elected to not build a fire station in this area yet. The Department will monitor call volume and performance quarterly and annually to identify trends that could negatively affect the residents in this area.

Table 3.18 Special Risk PZ9		
Special Risk		
Address	OVAP	Reason for "Special" rating
1473 Rosemary Dr	36.4	Life Safety: 24 Hour Care Facility
1687 Paonia CT	36.3	Life Safety: 24 Hour Care Facility
1861 Sapling CT	36.3	Life Safety: 24 Hour Care Facility
1671 Thatch Cr	36.3	Life Safety: 24 Hour Care Facility
599 Topeka Way	36.1	Water Supply
1551 Prairie Hawk Dr	33.1	Life Safety: School
1470 Clear Sky Way	32.4	Life Safety: School
1640 Wild Rye CT	30.4	Life Safety: 24 Hour Care Facility
1768 Rose Petal Ln	30.0	Life Safety: 24 Hour Care Facility

PZ9 experienced a relatively low number of fire related incidents from 2016 through 2020 with 113 incidents or 7.3% of all fire incidents as shown in Table 3.19. Of the fire incidents in PZ9, 21 were structure fire responses (15 residential and six commercial) that resulted in four ERF arrivals (two residential and two commercial)

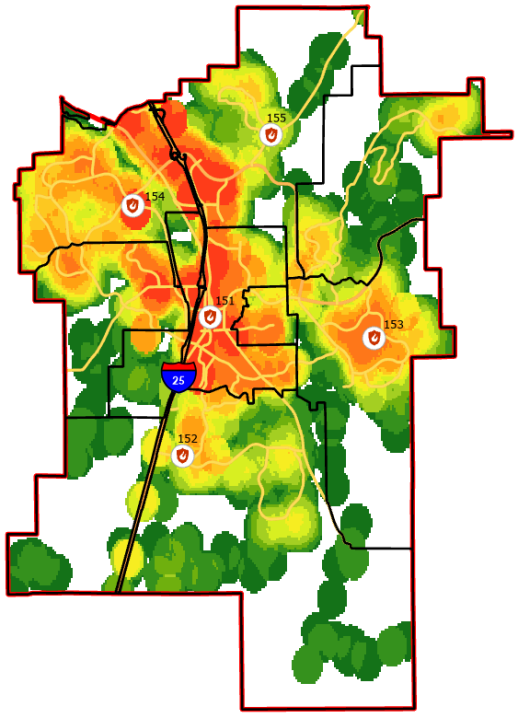
Fire Risk Table 3.19

		Fire Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Commercial Fire Alarm (30) Residential Fire Alarm (15) Smoke Investigation Inside (14) Passenger Car Fire (1) Dumpster Fire (0) Lightning Strike (0) Alarm Reset (0) Arching Transformer (0) Fire Other (0) Unattached Building Fire (0)	Residential Structure Fire (15) Commercial Carrier Fire (0) Train Fire (0) Explosion with Fire (0)	Commercial Structure Fire (6)

4. Emergency Medical Services (EMS) Risks

Castle Rock Fire and Rescue Department responded to 17,237 EMS incidents between 2016 and 2020, and continues to be the highest service demand at 62% of all calls for service. In general, EMS is a high probability / low consequence event that does not unduly burden the system. The department understands that as the population ages, the calls for EMS will increase. One aspect of this that the department has quantified is the senior population living within either a 24-hour care facility or independent senior living facilities. In an internal study of responses to these facilities, the department estimated that there will be one call for service per resident per year. Map 4.1 (right) depicts all EMS calls from 2016 – 2020.

Map 4.1 EMS Responses



The probability of at least one low risk, EMS (emergent) incident is 65.1%. Moderate risk EMS is classified into two categories, Medical Assist and Motor Vehicle Collision (MVC). The probability of at least one moderate risk medical assist is 99.2% and the probability of a moderate risk MVC is 64.9%. EMS high risk is also classified into two categories, Medical Assist and MVC. The probability of at least one high risk Medical Assist is 13.9% and the probability of a high risk MVC is 3.3%. Based on the 95% probability criteria established within his document, the only high probability EMS risk is the moderate risk that include Medical Assists BRAVO, CHARLIE, and DELTA.

EMS Risk Table 4.1 CRFD EMS Risk

		EMS Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High		EMS Moderate Risk (8820) • Medical Assist: BRAVO (1282) • Medical Assist: CHARLIE (4535) • Medical Assist: DELTA (3003)	
	Low	EMS Low Risk (1920) • Medical Assist: ALPHA (1605) • Medical Assist: OMEGA (4) • Medical Alarm (176) • Life Assist (135)	EMS Moderate: MVC (1908) • MVC Unknown Injury (1351) • MVC Multiple Injury (556) • Train Accident (1)	EMS High Risk (273) • Medical Assist: ECHO (273) EMS High Risk: MVC (61) • MVC Auto/Ped or bicycle (61) EMS Special Risk: (4) • Mass Casualty/MCI (4)

District-wide, the greatest EMS risk is posed by the 24-hour care facilities based on the probability of on a call for service. Secondary to the 24-hour care facilities, the educational facilities have a higher than normal population density during school hours which can pose a greater probability of calls for service.

Station Planning Zone 1: EMS

Planning Zone 1 contains four 24-hour care facilities and two senior independent living complexes, and six educational facilities. The greatest EMS risks in PZ1 are the 24-hour care facilities.

- 24-hour Care Facilities:
  - Brookside Inn: 1297 S Perry St
  - Brookside II: 1055 S Perry St
  - Cantril House: 221 Cantril St
  - Safe at Home Residences: 1605 Whitetail DR
- Independent Senior Living:
  - Reyn Rock Apartments
  - Oakwood Apartments
- Educational Facilities:
  - Douglas County High School (North Building): 2842 N Front St
  - Douglas County High School (South Building): 2693 N Front St
  - Castle Rock Elementary School: 1103 Canyon DR
  - Daniel Oakes High School: 961 Plum Creek
  - Montessori School of Castle Rock: 15 S Gilbert St

EMS Risk Table 4.2 CRFD EMS Risk

		EMS Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High		EMS Moderate Risk (2498) • Medical Assist: BRAVO (347) • Medical Assist: CHARLIE (1326) • Medical Assist: DELTA (825)	
	Low	EMS Low Risk (658) • Medical Assist: ALPHA (543) • Medical Assist: OMEGA (1) • Medical Alarm (64) • Life Assist (50)	EMS Moderate: MVC (322) • MVC Unknown Injury (218) • MVC Multiple Injury (104) • Train Accident (0)	EMS High Risk (82) • Medical Assist: ECHO (82) EMS High Risk: MVC (21) • MVC Auto/Ped or bicycle (21) EMS Special Risk: (0) • Mass Casualty/MCI (0)

Station Planning Zone 2: EMS

Planning Zone 2 has one 24-hour care facility and elementary school. The greatest risk within PZ2 is the 24-hour care facility.

- 24-hour Care Facilities:
  - Valley House: 255 S Valley DR

- Educational Facilities:
  - South Ridge Elementary School: 1100 South St.

EMS Risk Table 4.3 CRFD EMS Risk

		EMS Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High		EMS Moderate Risk (255) • Medical Assist: BRAVO (40) • Medical Assist: CHARLIE (112) • Medical Assist: DELTA (103)	
	Low	EMS Low Risk (56) • Medical Assist: ALPHA (50) • Medical Assist: OMEGA (0) • Medical Alarm (2) • Life Assist (4)	EMS Moderate: MVC (21) • MVC Unknown Injury (15) • MVC Multiple Injury (6) • Train Accident (0)	EMS High Risk (8) • Medical Assist: ECHO (8) EMS High Risk: MVC (1) • MVC Auto/Ped or bicycle (1) EMS Special Risk: (0) • Mass Casualty/MCI (0)

Station Planning Zone 3: EMS

Planning Zone 3 has no 24-hour care centers or senior specific housing. However, PZ3 has three schools with a higher daytime population than the surrounding community. Therefore, the greatest EMS risk is the schools within PZ3.

- Educational Facilities:
  - Mesa Middle School: 365 Mitchell St
  - Flagstone Elementary: 104 Lovington St.
  - Rock Ridge Elementary: 400 N Heritage Ave

EMS Risk Table 4.4 CRFD EMS Risk

		EMS Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High		EMS Moderate Risk (863) • Medical Assist: BRAVO (102) • Medical Assist: CHARLIE (395) • Medical Assist: DELTA (366)	
	Low	EMS Low Risk (155) • Medical Assist: ALPHA (132) • Medical Assist: OMEGA (0) • Medical Alarm (17) • Life Assist (6)	EMS Moderate: MVC (130) • MVC Unknown Injury (84) • MVC Multiple Injury (46) • Train Accident (0)	EMS High Risk (37) • Medical Assist: ECHO (37) EMS High Risk: MVC (8) • MVC Auto/Ped or bicycle (8) EMS Special Risk: (0) • Mass Casualty/MCI (0)

Station Planning Zone 4: EMS

Planning Zone 4 has two 24-hour care facilities, six educational facilities, and one correctional facility. The greatest EMS risks in PZ4 are the 24-hour care facilities, followed by the correctional facility due to the probability of calls for service.

- 24-hour Care Facilities:
  - Bonaventure Senior Living: 1855 Low Meadow Boulevard
  - Castle Rock Assisted Living: 2473 Woodhouse Lane
- Correctional Facility:
  - Robert A. Christensen Justice Center: 4000 Justice Way
- Educational Facilities:
  - Aspen View Charter School: 2131 Low Meadow Blvd
  - Soaring Hawk Elementary School: 4665 Tangelvine DR
  - Meadow View Elementary School: 3700 Butterfield Crossing DR
  - Castle Rock Middle School: 2575 Meadows Blvd
  - Castle View High School: 5254 N Meadows Blvd
  - Strum Collaboration Campus: 4500 Limelight Way

EMS Risk Table 4.5 CRFD EMS Risk

		EMS Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High		EMS Moderate Risk (2267) • Medical Assist: BRAVO (328) • Medical Assist: CHARLIE (1240) • Medical Assist: DELTA (699)	
	Low	EMS Low Risk (445) • Medical Assist: ALPHA (378) • Medical Assist: OMEGA (3) • Medical Alarm (28) • Life Assist (36)	EMS Moderate: MVC (363) • MVC Unknown Injury (253) • MVC Multiple Injury (109) • Train Accident (1)	EMS High Risk (49) • Medical Assist: ECHO (49) EMS High Risk: MVC (17) • MVC Auto/Ped or bicycle (17) EMS Special Risk: (1) • Mass Casualty/MCI (1)

Station Planning Zone 5: EMS

Planning Zone 5 has five 24-hour care facilities (with three under construction) and two educational facilities. The greatest EMS risks in PZ5 are the 24-hour care facilities.

- 24-hour Care Facilities:
  - Castle Rock Care Center: 4001 Home Street
  - Metzler Memory Care: 864 Barranca Drive
  - Assured Assisted Living: 797 Tarpan Place
  - Assured Assisted Living: 815 Tarpan Place
  - Assisted Living of Woodlands: 1746 Wild Star Way
  - Solterra Assisted Living: 3999 Home St – under construction
  - Solterra Community Center: 3997 Home St– under construction
  - Solterra Memory Care: 3995 Home St – under construction
- Educational Facilities:
  - Renaissance Secondary School: 3954 Trail Boss Ln
  - Renaissance Expedition Learn Outward Bound School: 3960 Trail Boss Ln

EMS Risk Table 4.6 CRFD EMS Risk

		EMS Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High		EMS Moderate Risk (1381) • Medical Assist: BRAVO (246) • Medical Assist: CHARLIE (734) • Medical Assist: DELTA (401)	
	Low	EMS Low Risk (273) • Medical Assist: ALPHA (238) • Medical Assist: OMEGA (0) • Medical Alarm (15) • Life Assist (20)	EMS Moderate: MVC (371) • MVC Unknown Injury (260) • MVC Multiple Injury (111) • Train Accident (0)	EMS High Risk (38) • Medical Assist: ECHO (38) EMS High Risk: MVC (7) • MVC Auto/Ped or bicycle (7) EMS Special Risk: (2) • Mass Casualty/MCI (2)

Station Planning Zone 6: EMS

Planning Zone 6 has no 24-hour care centers or senior specific housing, but one elementary school. This school in not a significant source of calls for service. Therefore, based on probability, the greatest risk in PZ6 is State Highway 86 and the typical EMS risks within a residential community.

- Educational Facility:
  - Sage Canyon Elementary: 2420 Autumn Sage St

EMS Risk Table 4.7 CRFD EMS Risk

		EMS Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High		EMS Moderate Risk (2852) • Medical Assist: BRAVO (48) • Medical Assist: CHARLIE (118) • Medical Assist: DELTA (116)	
	Low	EMS Low Risk (55) • Medical Assist: ALPHA (46) • Medical Assist: OMEGA (0) • Medical Alarm (8) • Life Assist (1)	EMS Moderate: MVC (21) • MVC Unknown Injury (12) • MVC Multiple Injury (9) • Train Accident (0)	EMS High Risk (14) • Medical Assist: ECHO (14) EMS High Risk: MVC (0) • MVC Auto/Ped or bicycle (0) EMS Special Risk: (0) • Mass Casualty/MCI (0)

Station Planning Zone 7: EMS

Planning Zone 7 has two 24-hour care facilities and one education facility. The greatest EMS risks in PZ7 are the 24-hour care facilities.

- 24-hour Care Facilities:
  - Assured Assisted Living: 572 Evening Song Drive
  - JAI Residential Care: 5858 Point Rider Cr
- Educational Facility:
  - World Compass Academy: 2490 S Perry St

EMS Risk Table 4.8 CRFD EMS Risk

		EMS Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High		EMS Moderate Risk (435) • Medical Assist: BRAVO (68) • Medical Assist: CHARLIE (176) • Medical Assist: DELTA (191)	
	Low	EMS Low Risk (97) • Medical Assist: ALPHA (69) • Medical Assist: OMEGA (0) • Medical Alarm (21) • Life Assist (7)	EMS Moderate: MVC (56) • MVC Unknown Injury (37) • MVC Multiple Injury (19) • Train Accident (0)	EMS High Risk (23) • Medical Assist: ECHO (23) EMS High Risk: MVC (1) • MVC Auto/Ped or bicycle (1) EMS Special Risk: (0) • Mass Casualty/MCI (0)

Station Planning Zone 8: EMS

Planning Zone 8 has no 24-hour care centers or education facilities. The greatest EMS risk in PZ8 are the residential homes and the West Frontage road.

EMS Risk Table 4.9 CRFD EMS Risk

		EMS Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High		EMS Moderate Risk (14) • Medical Assist: BRAVO (1) • Medical Assist: CHARLIE (7) • Medical Assist: DELTA (6)	
	Low	EMS Low Risk (6) • Medical Assist: ALPHA (6) • Medical Assist: OMEGA (0) • Medical Alarm (0) • Life Assist (0)	EMS Moderate: MVC (2) • MVC Unknown Injury (2) • MVC Multiple Injury (0) • Train Accident (0)	EMS High Risk (1) • Medical Assist: ECHO (1) EMS High Risk: MVC (0) • MVC Auto/Ped or bicycle (0) EMS Special Risk: (0) • Mass Casualty/MCI (0)

Station Planning Zone 9: EMS

Planning Zone 9 has six 24-hour care facilities, one independent senior complex, and two educational facilities.

- 24-hour Care Facilities:
  - Assured Assisted Living: 1687 Paonia Ct
  - Assured Assisted Living: 1671 Thatch Circle
  - Assured Assisted Living: 1861 Sapling Court
  - Castle Rock Assisted Living: 1640 Wild Rye Court
  - Castle Rock Assisted Living II: 1768 Rose Pedal Lane
  - Residential Assisted Living: 1473 Rosemary DR

- Independent Senior Living:
  - Auburn Ridge Apartments: 1101 Auburn DR
- Educational Facilities:
  - Clear Sky Elementary: 1470 Clear Sky Way
  - Academy Charter School: 1551 Prairie Hawk DR

EMS Risk Table 4.10 CRFD EMS Risk

		EMS Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High		EMS Moderate Risk (744) • Medical Assist: BRAVO (99) • Medical Assist: CHARLIE (365) • Medical Assist: DELTA (280)	
	Low	EMS Low Risk (145) • Medical Assist: ALPHA (113) • Medical Assist: OMEGA (0) • Medical Alarm (21) • Life Assist (11)	EMS Moderate: MVC (54) • MVC Unknown Injury (34) • MVC Multiple Injury (20) • Train Accident (0)	EMS High Risk (21) • Medical Assist: ECHO (21) EMS High Risk: MVC (1) • MVC Auto/Ped or bicycle (1) EMS Special Risk: (0) • Mass Casualty/MCI (0)

5. Hazardous (HAZMAT) Materials Risks

In August of 2021, the Castle Rock Fire and Rescue completed a Hazardous Materials Commodity Study that evaluated the hazardous materials traveling through and contained with CRFD's jurisdiction. At the time of the study, there were 204 commercial occupancies that met the minimum hazardous material reporting requirements per the 2018 International Fire Code (IFC) adopted by Town of Castle Rock Town Council in 2019. These occupancies were assigned a risk category (Low, Ordinary, Significant, or Special) based on the material(s) stored, quantity, process concerns, protection systems, structural concerns, and the potential impact to the community and environment (Map 5.1, Appendix C). The department has one helipad, at the local hospital. Additionally, there is one soft surface private airstrip that is used by a small single engine propeller plane (table 5.1). None of these facilities meet the requirements for the department to staff or maintain Aircraft Rescue and Fire Fighting (ARFF) apparatus or certifications.

Map 5.1 HAZMAT Responses

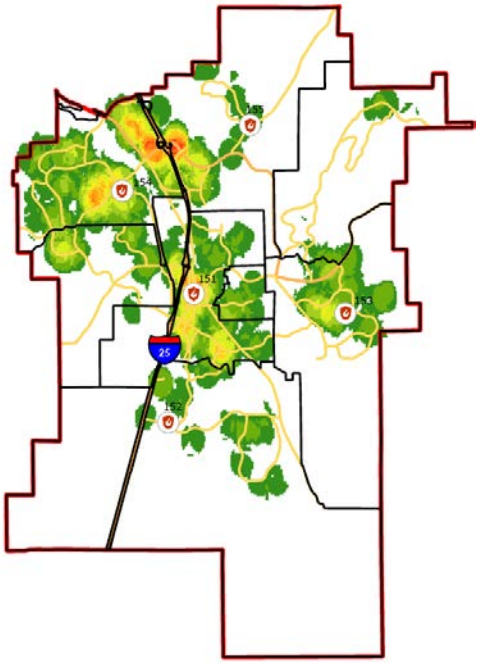


Table 5.1 CRFD HAZMAT Risk Levels										
Risk Level	Station Planning Zone									
	CRFD	1	2	3	4	5	6	7	8	9
Low	96	25	0	7	36	19	3	3	0	3
Ordinary	81	23	0	2	30	10	1	7	0	8
Significant	9	3	0	1	1	0	1	3	0	0
Special	18	9	0	2	4	1	0	0	0	2
Sub-Total	204	60	0	12	71	30	5	13	0	13
Helipad	1	0	0	0	1	0	0	0	0	0
Airstrip	1	0	0	1	0	0	0	0	0	0
Total	207	60	0	13	72	30	5	13	0	13

The probability of at least one low risk HAZMAT incident is 35.03%. The probability of at least one moderate risk HAZMAT incident is 7.38%. The probability of at least one high risk HAZMAT incident is 0.87%. Based on the 95% probability criteria established within his document, there are no high probability HAZMAT risks.

For the period of 2016 – 2020, CRFD responded to 751 low, 178 moderate, and 16 high risk HAZMAT incidents. The department's primary HAZMAT incidents are inside and outside natural/LP gas leaks followed by gas line rupture (typical from excavation equipment). Hazardous materials incidents requiring special equipment or personal protective equipment (PPE) are very rare. Refer to table 5.2 for a breakdown of all HAZMAT incident.

Table 5.2 CRFD HAZMAT Risk

		HAZMAT Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Natural/LP Gas Leak Inside (346) Natural/LP Gas Leak Outside (181) CO Alarm Asymptomatic (76) Odor Investigation (109) Fuel Spill less than 5 gallons (38) Environmental Alarm (1)	Gas Line Rupture (127) Fuel Spill more than 5 gallons (9) HAZMAT Investigation (4) CO Alarm Symptomatic (38)	HAZMAT (16)

Overall, the greatest risk to the community and the environment is the hazardous material that travels through the Town and fire protection district via the state and interstate highways because of the variety of materials, frequency of transport, and potential for release.

Station Planning Zone 1: HAZMAT

Planning Zone 1 (PZ1), map 5.2, contains the most hazardous materials facilities, table 5.3, with 60 facilities. Among those are eight "Special" risk facilities. Additionally, PZ1 has several miles of interstate highway and railroad within the district that pose the greatest overall hazardous materials risk because of the variety of materials, frequency of transport, and potential for release. With respect to fixed facilities, the greatest hazardous materials risk is AmeriGas at 511 S Gilbert St due to the volume of LP gas stored at the facility. This is closely followed by Comm Net, 1552 and 1562 N. Park Street and Century Link at 330 Sixth St. These are telephone switch centers with a variety of hazardous materials risks, large number of lead acid batteries. Because of the products stored at Comm Net and Century Link, the department added a Hazardous Materials apparatus to the initial response for any reported fire within those occupancies.

Table 5.3 HAZMAT Risk PZ1	
Low	25
Ordinary	23
Significant	3
Special	9

Table 5.4 Special HAZMAT Risk PZ1	
Address	Reason for Special rating
511 S Gilbert Street	Quantity of material, Compressed gases
1555 & 1562 N Park Street	Quantity of material, Corrosives
330 Sixth St	Quantity of material, Corrosives
1929 Liggett Road Bldg A & B	Quantity of material, Process Hazard, Corrosives
414 N Wilcox Street	Quantity of material, Process hazard, Structural concern
1769 Park Street	Quantity of material
175 Plum Creek Parkway	Quantity on material, Rack storage

For the period of 2016 – 2020, PZ1 responded to 182 low, 38 moderate, and 7 high risk HAZMAT incidents. Refer to table 5.5 for a breakdown of all HAZMAT incident.

Table 5.5 CRFD HAZMAT Risk

		HAZMAT Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Natural/LP Gas Leak Inside (77) Natural/LP Gas Leak Outside (50) CO Alarm Asymptomatic (11) Odor Investigation (35) Fuel Spill less than 5 gallons (8) Environmental Alarm (1)	Gas Line Rupture (28) Fuel Spill more than 5 gallons (2) HAZMAT Investigation (1) CO Alarm Symptomatic (7)	HAZMAT (7)

Station Planning Zone 2: HAZMAT

Planning Zone 2 (PZ2), map 5.3, is smallest of all PZs, and has zero hazardous materials facilities, table 5.4. Therefore, the greatest HAZMAT risk in PZ2 is what may be found in a residential dwelling or an incident on the roadway.

Table 5.6 HAZMAT Risk PZ2	
Low	0
Ordinary	0
Significant	0
Special	0

For the period of 2016 – 2020, PZ2 responded to 20 low, 4 moderate, and 0 high risk HAZMAT incidents. Refer to table 5.7 for a breakdown of all HAZMAT incident.

Table 5.7 CRFD HAZMAT Risk

		HAZMAT Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Natural/LP Gas Leak Inside (10) Natural/LP Gas Leak Outside (1) CO Alarm Asymptomatic (2) Odor Investigation (6) Fuel Spill less than 5 gallons (1) Environmental Alarm (0)	Gas Line Rupture (4) Fuel Spill more than 5 gallons (0) HAZMAT Investigation (0) CO Alarm Symptomatic (0)	HAZMAT (0)

Station Planning Zone 3: HAZMAT

Planning Zone 3 (PZ3), map 5.4, has a total of 12 hazardous materials facilities, two of which are Special Risks and several miles of state highway. The two Special Risk facilities are the Mitchell Creek Lift Station, an automated water lift/pump station, and the Ray Waterman Regional Water Treatment Center. These two facilities have protection/alarm systems, and are considered critical infrastructure. However, they have sufficient quantity of product to warrant concern. The Hazardous Materials Commodity Study showed that the type and quantity of hazardous materials being transported on State Highway 86 is relatively low[10].

Table 5.8 HAZMAT Risk PZ3	
Low	7
Ordinary	2
Significant	1
Special	2

Table 5.9 Special HAZMAT Risk PZ3	
Address	Reason for Special rating
5708 Wagonwheel Trail	Quantity of material
1282 Castle Oaks Drive	Quantity of material, Process hazard, Compressed gasses, Corrosives

For the period of 2016 – 2020, PZ3 responded to 82 low, 20 moderate, and 1 high risk HAZMAT incidents. Refer to table 5.10 for a breakdown of all HAZMAT incident.

[10] Town of Castle Rock: Hazardous Material Commodity Flow Study, August 2021

Table 5.10 CRFD HAZMAT Risk

		HAZMAT Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Natural/LP Gas Leak Inside (38) Natural/LP Gas Leak Outside (19) CO Alarm Asymptomatic (16) Odor Investigation (8) Fuel Spill less than 5 gallons (1) Environmental Alarm (0)	Gas Line Rupture (13) Fuel Spill more than 5 gallons (2) HAZMAT Investigation (0) CO Alarm Symptomatic (5)	HAZMAT (1)

Station Planning Zone 4: HAZMAT

Planning Zone 4 (PZ4), map 5.5, has a total of 71 hazardous materials facilities. Additionally, PZ4 has several miles of railroad and interstate highway within the district that pose the greatest overall hazardous materials risk because of the variety of materials, frequency of transport, and potential for release. With respect to fixed facilities, the greatest hazardous materials risk is the Castle Rock Adventist Hospital Campus due to the volume of products, critical infrastructure, proximity to residential areas, and the life safety risks within the facility.

Table 5.11 HAZMAT Risk PZ4	
Low	36
Ordinary	30
Significant	1
Special	4

Table 5.12 Special HAZMAT Risk PZ4	
Address	Reason for Special rating
2350 Meadows Boulevard	Quantity of material
4175 Castleton Ct	Quantity of material, Process hazard
3845 Ambrosia St	Quantity of Materials
2807 N US Highway 85	Quantity of material, Process hazard

For the period of 2016 – 2020, PZ4 responded to 215 low, 64 moderate, and 4 high risk HAZMAT incidents. Refer to table 5.13 for a breakdown of all HAZMAT incident.

Table 5.13 CRFD HAZMAT Risk

		HAZMAT Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Natural/LP Gas Leak Inside (105) Natural/LP Gas Leak Outside (49) CO Alarm Asymptomatic (19) Odor Investigation (27) Fuel Spill less than 5 gallons (18) Environmental Alarm (0)	Gas Line Rupture (46) Fuel Spill more than 5 gallons (4) HAZMAT Investigation (3) CO Alarm Symptomatic (11)	HAZMAT (4)

Station Planning Zone 5: HAZMAT

Planning Zone 5 (PZ5), map 5.6, has a total of 30 hazardous materials facilities, table 5.7. Additionally, PZ5 has several miles of interstate highway on its southwestern border. The highway represents the greatest overall hazardous materials risk because of the variety of materials, frequency of transport, and potential for release. With respect to fixed facilities, the greatest risk is Silver Heights Water and Sanitation facility at 1027 Harvey Street due to the quality of material on-sight.

Table 5.14 HAZMAT Risk PZ5	
Low	17
Ordinary	10
Significant	0
Special	1

Table 5.15 Special HAZMAT Risk PZ5	
Address	Reason for Special rating
1027 Harvey St	Quantity of material, No Fire System

For the period of 2016 – 2020, PZ5 responded to 105 low, 12 moderate, and 0 high risk HAZMAT incidents. Refer to table 5.16 for a breakdown of all HAZMAT incident.

Table 5.16 CRFD HAZMAT Risk

		HAZMAT Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Natural/LP Gas Leak Inside (48) Natural/LP Gas Leak Outside (28) CO Alarm Asymptomatic (8) Odor Investigation (14) Fuel Spill less than 5 gallons (7) Environmental Alarm (0)	Gas Line Rupture (5) Fuel Spill more than 5 gallons (1) HAZMAT Investigation (0) CO Alarm Symptomatic (6)	HAZMAT (3)

Station Planning Zone 6: HAZMAT

Planning Zone 6 (PZ6), map 5.7, has five hazardous materials facilities, and borders several miles of state highway 86. The Hazardous Materials Commodity Study showed that the type and quantity of hazardous materials being transported on State Highway 86 is relatively low[11]. However, given the other risks within P6, State Highway 86 is still the greatest hazardous materials risk.

Table 5.17 HAZMAT Risk PZ6	
Low	3
Ordinary	1
Significant	1
Special	0

For the period of 2016 – 2020, PZ6 responded to 20 low, 12 moderate, and 0 high risk HAZMAT incidents. Refer to table 5.18 for a breakdown of all HAZMAT incident.

Table 5.18 CRFD HAZMAT Risk

		HAZMAT Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Natural/LP Gas Leak Inside (6) Natural/LP Gas Leak Outside (6) CO Alarm Asymptomatic (3) Odor Investigation (5) Fuel Spill less than 5 gallons (0) Environmental Alarm (0)	Gas Line Rupture (9) Fuel Spill more than 5 gallons (0) HAZMAT Investigation (0) CO Alarm Symptomatic (3)	HAZMAT (0)

Station Planning Zone 7: HAZMAT

Planning Zone 7 (PZ7), map 5.8, has a total of 13 hazardous materials facilities, table 5.9. Additionally, PZ7 has several miles of interstate highway on the western border. The highway represents the greatest overall hazardous materials risk because of the variety of materials, frequency of transport, and potential for release. With respect to fixed facilities, the greatest risks (Significant) are the communication facilities on Garton Road due to the unique suppression systems, distance from a station and being considered critical infrastructure.

Table 5.19 HAZMAT Risk PZ7	
Low	3
Ordinary	7
Significant	3
Special	0

For the period of 2016 – 2020, PZ7 responded to 50 low, 19 moderate, and 0 high risk HAZMAT incidents. Refer to table 5.20 for a breakdown of all HAZMAT incident.

[11] Town of Castle Rock: Hazardous Material Commodity Flow Study, August 2021

Table 5.20 CRFD HAZMAT Risk

		HAZMAT Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Natural/LP Gas Leak Inside (23) Natural/LP Gas Leak Outside (12) CO Alarm Asymptomatic (9) Odor Investigation (6) Fuel Spill less than 5 gallons (0) Environmental Alarm (0)	Gas Line Rupture (14) Fuel Spill more than 5 gallons (1) HAZMAT Investigation (0) CO Alarm Symptomatic (4)	HAZMAT (0)

Station Planning Zone 8: HAZMAT

Planning Zone 8 (PZ8), map 5.9, is the least populated of all the PZ with a total population of 329 residents. PZ8 has no hazardous material occupancies. However, PZ8 is adjacent to Interstate 25 and has a couple miles of railroad on its eastern border. These represent the greatest HAZMAT risk in PZ8.

Table 5.21 CRFD HAZMAT Risk

		HAZMAT Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Natural/LP Gas Leak Inside (1) Natural/LP Gas Leak Outside (0) CO Alarm Asymptomatic (1) Odor Investigation (0) Fuel Spill less than 5 gallons (0) Environmental Alarm (0)	Gas Line Rupture (2) Fuel Spill more than 5 gallons (0) HAZMAT Investigation (0) CO Alarm Symptomatic (0)	HAZMAT (0)

Station Planning Zone 9: HAZMAT

Planning Zone 9 (PZ9), map 5.10, has a total of 13 hazardous materials facilities, table 5.10. While PZ9 only borders the highway at the southern eastern corner, the proximity to the highway still poses a potential risk. With respect to fixed facilities, the greatest risk is Douglas County School District Maintenance Facility at 701 Prairie Hawk Dr, due to the volume of and type of product used and stored, as well as processes used on-sight.

Table 5.22 HAZMAT Risk PZ9	
Low	3
Ordinary	8
Significant	0
Special	2

Table 5.23 Special HAZMAT Risk PZ9	
Address	Reason for Special rating
701 Prairie Hawk Dr	Quantity of material, Process hazard
550 Topeka Way	Quantity of material, Process hazard, structural concerns

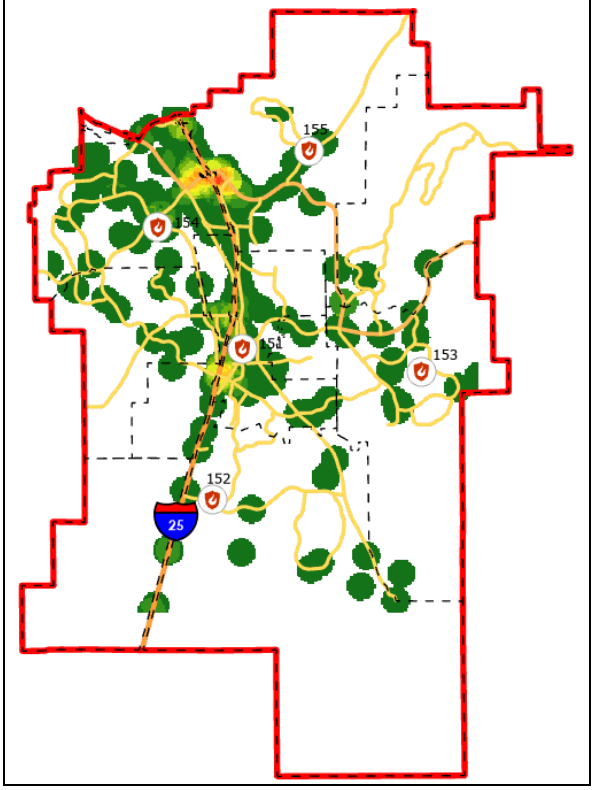
For the period of 2016 – 2020, PZ9 responded to 59 low, 8 moderate, and 1 high risk HAZMAT incidents. Refer to table 5.24 for a breakdown of all HAZMAT incident.

Table 5.24 CRFD HAZMAT Risk

		HAZMAT Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Natural/LP Gas Leak Inside (35) Natural/LP Gas Leak Outside (11) CO Alarm Asymptomatic (7) Odor Investigation (6) Fuel Spill less than 5 gallons (0) Environmental Alarm (0)	Gas Line Rupture (6) Fuel Spill more than 5 gallons (0) HAZMAT Investigation (0) CO Alarm Symptomatic (2)	HAZMAT (1)

6. Technical Rescue Risks

Map 6.0 Technical Rescue Responses



Generally speaking, Technical Rescue incidents are low frequency / high risk events that may require specialized equipment and training to safely mitigate the incident. For the purpose of this and other related documents, Technical Rescue shall consist of the following disciplines:

- Building / Structural Collapse
- Confined Space
- Vehicle Extrication
- High/Low Angle Rope Rescue
- Trench Rescue
- Water/Ice Rescue

The probability of at least one low risk Technical Rescue incident is 0.33%. The probability of at least one moderate risk Technical Rescue incident is 4.92%[12]. The probability of at least one high risk Technical Rescue incident is 0.11%. Based on the 95% probability criteria established within this document, there are no high probability Technical Rescue risks. However, the low frequency of these incidents increases the risks to the victim and resources. This is because more time must be dedicated to training to just remain proficient in the technical rescue skills whereas, with other more frequent incident types, members can maintain mastery of skills based on the daily operations.

There are 607 areas that are known to have or are likely to have a confined space that would require a permit prior to entry. These are highlighted and mapped by PZ (Confined Space Rescue Map 6.1). These facilities are defined by the Town of Castle Rock Public Works Department and detailed below:

- Sanitary Sewer Facility: Lift stations, Grinder, Etc. These most likely have a confined space and/or the possibility of chemicals or gases being a hazard.
- Water Treatment Plant: These most likely have a confined space and/or the possibility of chemicals or gases being a hazard.
- Storm Outfalls over 36in: Subset of the stormwater outfalls that are over 36 inches.
- Manhole to Stormceptor[13]: Subset of the storm manholes that are associated with the underground storm water systems (Stormceptor)
- Water Manhole with Confined Space: Subset of the water manholes that are associated with a PRV Vault or other Vault that we believe to be a confined space.

[12] Note: Tech Rescue probability is based solely on the incident type from CAD and does not reflect the independently reviewed technical rescue incidents evaluating actions taken and review of the narrative report.

[13] Stormceptor: Subset of the stormwater ponds layer that are underground storm water detention facilities (some of these are town owned/maintained some of these are privately owned and maintained).

- Water Manhole with Possible Confined Space: Subset of the water manholes that may have a confined space but we are unsure.

Vehicle extrication is possible throughout the jurisdiction (Table 6.1). However, the probability increases at high-volume traffic intersections, major routes, state and interstate highways. Specific areas are briefly discussed by PZ.

Table 6.1 CRFD Extrication by station and planning zone

	151	152	153	154	155	SMFRA 39	Total
PZ1	48	0	0	0	0	0	48
PZ2	1	0	0	0	0	0	1
PZ3	0	0	17	0	0	0	17
PZ4	0	0	0	87	0	0	87
PZ5	0	0	0	0	64	0	64
PZ6	0	0	0	0	0	0	0
PZ7	0	8	1	0	0	0	7
PZ8	0	0	0	0	0	0	0
PZ9	7	0	0	8	0	0	15
Interstate	38	10	0	11	5	5	69
Total	94	18	18	106	69	5	310

Rope rescue risks are found throughout the jurisdiction, as typically low angle in nature with a few notable exceptions. Each PZ briefly discuss the rope rescue risk in that area.

Trench rescue is a dynamic risk that changes frequently based on commercial and residential development, in addition to the needed utility and infrastructure work to support a growing community. As such, it is not practical to identify the maximum risk within each PZ.

Using the risk model detailed in Section 2, there are a 77 perennial ponds (containing water year-round), 201 intermittent ponds and 75.3 miles of trails. Of those, 15 permanent ponds, 35 intermittent ponds, and 16.8 miles of stream are within 100 feet of a trail system, and there are 2.6 miles of Swift Water Special Risk areas mostly along East Plum Creek and Hangmans Gulch (Water/Ice Rescue Map 6.11).

While the jurisdiction has buildings dating back to the early 1900's, there is little threat of seismic activity and the primary risk of building collapse stems from vehicle crashes, ignition of a gas leak, or collapse during renovation. As such, it is not practical to identify the maximum risk within each PZ.

Table 6.2 CRFD Technical Rescue Risk

		Technical Rescue Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Explosion No Fire (6)	MVC Extrication (310) HI/LO Angle Rescue (3) Ice Rescue Human/Animal (2) Entrapment (16)	Building Collapse (1) Confined Space (1)

Station Planning Zone 1: Technical Rescue

Confined space: PZ1 has 120 confined space locations that require a permit before entering (Confined Space Rescue Map 6.2).

The maximum extrication risk in PZ1 is in the area of Interstate 25 and Mile Marker/exit 181 as well as the intersection of Plum Creek Parkway and Wilcox Street.

The maximum rope rescue risk in PZ1 is Rock Park. This area has numerous vertical, high, and low angle rescue opportunities. This is a popular hiking and climbing area. Access is limited as are potential rope anchor sites.

Water/Ice Rescue: PZ1 contains a total of 6 perennial ponds, 15 intermittent ponds, and roughly 15.4 (11.4 intermittent, 4.2 perennial) miles of stream. PZ1 High Risk areas are: 6 perennial ponds, 3 intermittent ponds, and 6.2 miles of stream (4.5 intermittent, 1.8 perennial). Additionally, PZ1 contains 1.4 miles of Special Risk areas along East Plum Creek and Hangmans Gulch (Water/Ice Rescue Map 6.12).

Table 6.3 CRFD Technical Rescue Risk

		Technical Rescue Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Explosion No Fire (2)	MVC Extrication (48) HI/LO Angle Rescue (2) Ice Rescue Human/Animal (0) Entrapment (5)	Building Collapse (0) Confined Space (0)

Station Planning Zone 2: Technical Rescue

Confined space: PZ2 has 8 confined space locations that require a permit before entering (Confined Space Rescue Map 6.3).

The maximum extrication risk in PZ2 is 5th Street in the area between Woodlands Boulevard and N Ridge Road. This is a main artery for the downtown area and has a relatively steep grade.

The maximum rope rescue risk in PZ2 is the Memmen Ridge area, there are numerous high and low angle rope rescue potentials.

Water/Ice Rescue: PZ2 contains a total of zero perennial ponds, 1 intermittent pond and roughly 1.4 (all intermittent) mile of stream. PZ2 contains 0.5 miles of stream are within 100 feet of a trail. There are no Swift Water Special Risk areas in PZ2 (Water/Ice Rescue Map 6.13).

Table 6.4 CRFD Technical Rescue Risk

		Technical Rescue Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Explosion No Fire (0)	MVC Extrication (1) HI/LO Angle Rescue (0) Ice Rescue Human/Animal (0) Entrapment (0)	Building Collapse (0) Confined Space (0)

Station Planning Zone 3: Technical Rescue

Confined space: PZ3 has 72 confined space locations that require a permit before entering (Confined Space Rescue Map 6.4).

The maximum extrication risk in PZ3 is on State Highway 86 / Founders Parkway. This is an alternate route for I-25 and also has a relatively steep grade heading east with steep slopes on both sides, and little shoulder area.

The maximum rope rescue risk in PZ3 is Mitchell Gulch trail system. Mitchell Gulch has several vertical and high angle areas, and a series of heavily traveled pathways that backs up to a middle school with a number of foot paths from children traversing the cliff lines.

Water/Ice Rescue: PZ3 contains 3 perennial ponds, 42 intermittent detention ponds, and roughly 9.8 (all intermittent) miles of streams. PZ3 High Risk areas are: 2 perennial ponds, 7 intermittent ponds, and 2.8 miles of stream. There are no Swift Water Special Risk areas in PZ3 (Water/Ice Rescue Map 6.14).

Table 6.5 CRFD Technical Rescue Risk

		Technical Rescue Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Explosion No Fire (0)	MVC Extrication (17) HI/LO Angle Rescue (1) Ice Rescue Human/Animal (1) Entrapment (3)	Building Collapse (0) Confined Space (0)

Station Planning Zone 4: Technical Rescue

Confined space: PZ4 has 140 confined space locations that require a permit before entering (Confined Space Rescue Map 6.5).

The maximum extrication risks in PZ4 are Interstate 25 (I-25) with access points at mile markers 184 and 185, and State Highway 85.

The maximum rope rescue risk in PZ4 is low angle rope rescue from miles of walking and biking trails with limited access points and few landmarks to identify victim location.

Water/Ice Rescue: PZ4 contains 4 perennial ponds, 8 intermittent ponds, and roughly 9.8 miles of streams (7.4 intermittent, 2.3 perennial). PZ4 High Risk areas are: 5 perennial ponds, 6 intermittent ponds, and 2.8 miles of stream (2.5 intermittent, 0.3 perennial). Additionally, PZ4 contains 0.7 miles of Swift Water Special Risk areas along East Plum Creek and an intermittent tributary (Water/Ice Rescue Map 6.15).

Table 6.6 CRFD Technical Rescue Risk

		Technical Rescue Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Explosion No Fire (2)	MVC Extrication (87) HI/LO Angle Rescue (0) Ice Rescue Human/Animal (0) Entrapment (4)	Building Collapse (0) Confined Space (0)

Station Planning Zone 5: Technical Rescue

Confined space: PZ5 has 64 confined space locations that require a permit before entering (Confined Space Rescue Map 6.6).

The maximum extrication risk in PZ5 is State Highway 86 / Founders Parkway, specifically in the Founders retail area.

The maximum rope rescue risk in PZ5 are vertical and high angle aspects in the cliffs west of Diamond Ridge and above Springer Park. Additionally, there are a number of homes built adjacent to the cliff lines.

Water/Ice Rescue: PZ5 contains 17 perennial ponds, 34 intermittent ponds, and roughly 3.9 miles of streams (all intermittent). PZ5 High Risk area is 4 perennial ponds, 4 intermittent ponds and 0.2 miles of stream. There are no Swift Water Special Risk areas in PZ5 (Water/Ice Rescue Map 6.16).

Table 6.7 CRFD Technical Rescue Risk

		Technical Rescue Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Explosion No Fire (1)	MVC Extrication (64) HI/LO Angle Rescue (0) Ice Rescue Human/Animal (0) Entrapment (1)	Building Collapse (0) Confined Space (0)

Station Planning Zone 6: Technical Rescue

Confined space: PZ6 has 36 confined space locations that require a permit before entering (Confined Space Rescue Map 6.7).

The maximum extrication risk in PZ6 is traffic along portions of State Highway 86 / Founders Parkway.

The maximum rope rescue risk in PZ6 is low angle MVC evacuations along Rocky View Rd and Valley View Rd, which are unlit, winding dirt roads.

Water/Ice Rescue: PZ6 contains 11 perennial ponds, 21 intermittent ponds, and roughly 9.5 miles of stream (9.2 intermittent, 0.3 perennial). PZ6 High Risk areas are: 7 perennial ponds, 7 intermittent ponds, and 1.4 miles of stream (1.3 intermittent, 0.1 perennial). There are no Swift Water Special Risk areas in PZ6 (Water/Ice Rescue Map 6.17).

Table 6.8 CRFD Technical Rescue Risk

		Technical Rescue Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Explosion No Fire (0)	MVC Extrication (0) HI/LO Angle Rescue (0) Ice Rescue Human/Animal (0) Entrapment (2)	Building Collapse (0) Confined Space (0)

Station Planning Zone 7: Technical Rescue

Confined space: PZ7 has 102 confined space locations that require a permit before entering (Confined Space Rescue Map 6.8).

While PZ7 does border I-25 on the western edge, there is no access to the highway. The maximum extrication risk in PZ7 is the east frontage road from mile marker 176 to mile marker 181.

The maximum rope rescue risk in PZ7 is low angle MVC evacuations.

Water/Ice Rescue PZ7 contains 16 permanent ponds, 89 detention ponds, and roughly 17.9 miles of streams (13.7 intermittent, 4.2 perennial). PZ7 High Risk areas are: 1 perennial pond, 3 intermittent ponds, and 0.3 miles of stream (0.1 intermittent, 0.2 perennial). Additionally, PZ7 contains 0.1 mile of Swift Water Special Risk areas along East Plum Creek (Water/Ice Rescue Map 6.18).

Table 6.9 CRFD Technical Rescue Risk

		Technical Rescue Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Explosion No Fire (1)	MVC Extrication (9) HI/LO Angle Rescue (0) Ice Rescue Human/Animal () Entrapment (1)	Building Collapse (1) Confined Space (1)

Station Planning Zone 8: Technical Rescue

Confined space: PZ8 has 4 confined space locations that require a permit before entering (Confined Space Rescue Map 6.9).

While PZ8 does border I-25 on the eastern edge, there is no access to the highway. The maximum heavy extrication risk in PZ8 is the west frontage road for I-25. Additionally, PZ8 has several miles of rail that parallels the frontage road the entire length of the frontage road in PZ8.

The maximum rope rescue risk in PZ8 is low angle MVC evacuations.

Water/Ice Rescue: PZ8 contains 16 perennial ponds, 8 intermittent ponds, and 0.9 miles of stream (all intermittent), none within 100' of a trail. (Water/Ice Rescue Map 6.19).

Table 6.10 CRFD Technical Rescue Risk

		Technical Rescue Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Explosion No Fire (0)	MVC Extrication (0) HI/LO Angle Rescue (0) Ice Rescue Human/Animal (0) Entrapment (0)	Building Collapse (0) Confined Space (0)

Station Planning Zone 9: Technical Rescue

Confined space: PZ9 has 61 confined space locations that require a permit before entering (Confined Space Rescue Map 6.10).

The maximum extrication risk in PZ9 is West Plum Creek Parkway, due to the amount of construction traffic and ongoing events at the Miller Activity Complex. PZ9 also contains several industrial facilities. These facilities pose the greatest mechanical entrapment risk throughout the jurisdiction.

High/Low Angle Rope Rescue: The Miller Activity Center (MAC) has zip lines, including supporting towers and platforms, and a vertical rock wall run by a private contractor. Additionally, the MAC has a set of incline stairs and a number of miles of trails open to the public. CRFD would provide a supporting role for zip line & rock wall incidents during the day and would be entirely responsible for incidents involving any of the recreation features during off hours. This would include vertical, high angle and low angle rescues and evacuations. There is a potential for victims to become stuck on zip lines during off hours requiring technician level rescues.

Water/Ice Rescue: PZ9 contains 3 perennial ponds, 15 intermittent ponds, and roughly 6.6 miles of streams (all intermittent). PZ9 High Risk areas are: 5 intermittent ponds and 2.6 miles of stream. Additionally, PZ9 contains 0.4 miles of Swift Water Special Risk areas along intermittent tributaries (Water/Ice Rescue Map 6.20).

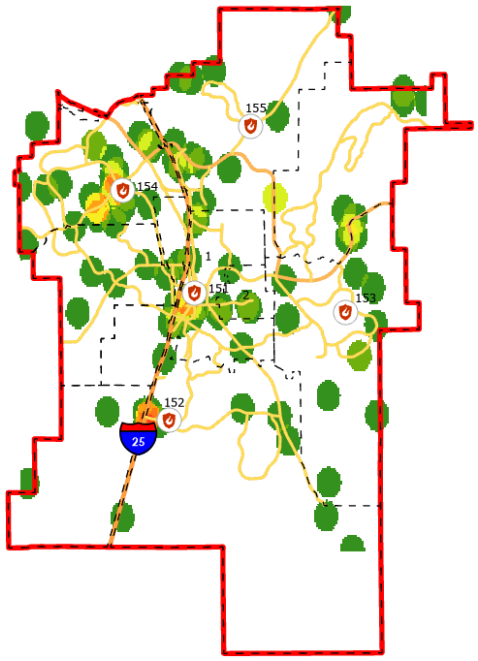
Table 6.11 CRFD Technical Rescue Risk

		Technical Rescue Risk 2016 - 2020		
		Low	Moderate	High / Special
Frequency	High			
	Low	Explosion No Fire (0)	MVC Extrication (15) HI/LO Angle Rescue (0) Ice Rescue Human/Animal (0) Entrapment (0)	Building Collapse (0) Confined Space (0)

7. Wildland Urban Interface (WUI) Risks

Castle Rock Fire and Rescue Department responds to four types of wildland fires, Outside Fire, Small Brush Fire, Large Brush Fire and Wildland Interface Fire. An outside fire is a fire in a container, mulch bed, small trash receptacle. A Small Brush Fire is a grass, brush or weeds on fire NOT threatening any structures and NOT reported as large or fast moving and smaller than a football field. A Large Brush Fire is reports grass, brush or weeds on fire NOT threatening any structures, reported as larger than a Football Field. A Wildland Interface Fire is a LARGE or fast-moving fire that is threatening structures.. Given the local topography, native flora and fauna, development, climate, and weather patterns, Castle Rock has the potential for brush / wildland fire throughout the jurisdiction year-round.

Map 7.0 Wildland Fire Responses



The wildland risk is also directly impacted by weather conditions, specifically; temperature, relative humidity, wind, and fuel moisture content. Under certain conditions (high temperatures, low humidity, high winds, and dry fuels), these factors result in Red Flag Warnings. A Red Flag Warning indicates conditions are ideal for a wildland fire start, will support rapid fire spread, or contribute to extreme fire behavior. When the National Weather Service issues a red flag warning for the area, the Douglas County Regional Communication Center (DRCC) automatically changes response mode from "Normal" to "Red Flag". This change activate an alternate response plan adding a second alarm to the initial dispatch.

Each PZ has been evaluated using the criteria established in the CWPP, focusing on moderate, high and very high, to determine the number of acres per risk category. Throughout the entire jurisdiction of roughly 42,240 acres, 11,782 acres (28%) were deemed to have a moderate wildland urban interface risk or greater (moderate 337 acres, high 9,927 acres, and very high 1,518). (Map 7.1, Appendix E).

Table 7.1 places each of the 257 wildland responses from 2016 through 2020 into their relevant risk categories.

The probability of at least one low risk Wildland incident is 6.98%. The probability of at least one moderate risk Wildland incident is 4.55%. The probability of at least one high risk Wildland incident is 2.17%. Based on the 95% probability criteria established within his document, there are no high probability Wildland risks.

Wildland Risk Table 7.1 CRFD

		Risk		
		Low	Moderate	High / Special
Frequency	High			
	Low	Smoke Investigation Outside (99) Illegal / Controlled Burn (33)	Field/Open Area Fire/Brush: Non-Threatening (85)	Wildland Interface Fire/Brush: Threatening (40)

Station Planning Zone 1: Wildland

Planning Zone 1 (PZ1) has no areas of moderate risk, but 467 acres of high risk and 739 rated as very high. The areas of very high risk are in the Woodlands, Escavera, Caig & Gould, Glover, & Castle Grove neighborhoods (Map 7.2, Appendix E). PZ1 experienced 56 wildland fire incidents from 2016 through 2020. PZ1

Wildland Risk Table 7.2 CRFD

		Risk		
		Low	Moderate	High / Special
Frequency	High			
	Low	Smoke Investigation Outside (27) Illegal / Controlled Burn (7)	Field/Open Area Fire/Brush: Non-Threatening (16)	Wildland Interface Fire/Brush: Threatening (6)

Station Planning Zone 2: Wildland

Planning Zone 2 (PZ2) has no areas of moderate or high risk, and 215 rated as very high risk. The areas of very high risk are in adjacent to the Memmen Ridge area (Map 7.3, Appendix E). PZ2 experienced 15 wildland fire incidents from 2016 through 2020.

Wildland Risk Table 7.3 CRFD

		Risk		
		Low	Moderate	High / Special
Frequency	High			
	Low	Smoke Investigation Outside (10) Illegal / Controlled Burn (2)	Field/Open Area Fire/Brush: Non-Threatening (1)	Wildland Interface Fire/Brush: Threatening (2)

Station Planning Zone 3: Wildland

Planning Zone 3 (PZ3) has no areas of moderate risk, 2,083 acres of high risk, and 24 rated as very high risk. The areas of very high risk are in the Founder Village, Castlewood Ranch, Oaks, Castle Ridge, and portions of the Terrian neighborhoods (Map 7.4, Appendix E). PZ3 experienced 35 wildland fire incidents from 2016 through 2020.

Wildland Risk Table 7.4 CRFD

		Risk		
		Low	Moderate	High / Special
Frequency	High			
	Low	Smoke Investigation Outside (13) Illegal / Controlled Burn (6)	Field/Open Area Fire/Brush: Non-Threatening (11)	Wildland Interface Fire/Brush: Threatening (5)

Station Planning Zone 4: Wildland

Planning Zone 4 (PZ4) has no areas of moderate or very high risk, but 2,483 rated as high risk. The areas of high risk are in all portions of The Meadows, The Pines, and Castle Villas neighborhoods (Map 7.5, Appendix E). PZ4 experienced 49 wildland fire incidents from 2016 through 2020.

Wildland Risk Table 7.5 CRFD

		Risk		
		Low	Moderate	High / Special
Frequency	High			
	Low	Smoke Investigation Outside (17) Illegal / Controlled Burn (5)	Field/Open Area Fire/Brush: Non-Threatening (16)	Wildland Interface Fire/Brush: Threatening (11)

Station Planning Zone 5: Wildland

Planning Zone 5 (PZ5) has 337 acres of moderate risk, 489 acres of high risk, and 541 acres of very high risk. The areas of very high risk are in the Diamond Ridge Estates, Timber Canyon, and Pinion Soliel neighborhoods (Map 7.6, Appendix E). PZ5 experienced 37 wildland fire incidents from 2016 through 2020.

Wildland Risk Table 7.6 CRFD

		Risk		
		Low	Moderate	High / Special
Frequency	High			
	Low	Smoke Investigation Outside (13) Illegal / Controlled Burn (5)	Field/Open Area Fire/Brush: Non-Threatening (13)	Wildland Interface Fire/Brush: Threatening (6)

Station Planning Zone 6: Wildland

Planning Zone 6 (PZ6) has no areas of moderate or very high risk, and 1,069 acres rated as high risk. The areas of high risk are in the Terrain and Cobblestone Ranch neighborhoods (Map 7.7, Appendix E). PZ6 experienced 10 wildland fire incidents from 2016 through 2020.

Wildland Risk Table 7.7 CRFD

		Risk		
		Low	Moderate	High / Special
Frequency	High			
	Low	Smoke Investigation Outside (3) Illegal / Controlled Burn (1)	Field/Open Area Fire/Brush: Non-Threatening (5)	Wildland Interface Fire/Brush: Threatening (1)

Station Planning Zone 7: Wildland

Planning Zone 7 (PZ7) has no areas of moderate or very high risk, and 2,247 acres rated as high risk. The areas of high risk are Crystal Valley Ranch and Plum Creek neighborhoods (Map 7.8, Appendix E). PZ7 experienced 26 wildland fire incidents from 2016 through 2020.

Wildland Risk Table 7.8 CRFD

		Risk		
		Low	Moderate	High / Special
Frequency	High			
	Low	Smoke Investigation Outside (8) Illegal / Controlled Burn (3)	Field/Open Area Fire/Brush: Non-Threatening (13)	Wildland Interface Fire/Brush: Threatening (2)

Station Planning Zone 8: Wildland

Planning Zone 8 (PZ8) has no areas of moderate, high risk, or very high risk. All of the developed areas in PZ fall within unincorporated Douglas County (Map 7.9, Appendix E). PZ8 experienced 1 wildland fire incidents from 2016 through 2020.

Wildland Risk Table 7.9 CRFD

		Risk		
		Low	Moderate	High / Special
Frequency	High			
	Low	Smoke Investigation Outside (0) Illegal / Controlled Burn (0)	Field/Open Area Fire/Brush: Non-Threatening (1)	Wildland Interface Fire/Brush: Threatening (0)

Station Planning Zone 9: Wildland

Planning Zone 9 (PZ9) has no areas of moderate or very high risk, and 1,090 acres rated as high risk. The areas of high risk are in the Red Hawk, Castle Highlands, and portions of The Meadows neighborhoods (Map 7.10, Appendix E). PZ9 experienced 15 wildland fire incidents from 2016 through 2020.

Wildland Risk Table 7.10 CRFD

		Risk		
		Low	Moderate	High / Special
Frequency	High			
	Low	Smoke Investigation Outside (5) Illegal / Controlled Burn (4)	Field/Open Area Fire/Brush: Non-Threatening (2)	Wildland Interface Fire/Brush: Threatening (4)

8. Critical Infrastructure

The Castle Rock Fire and Rescue Department has conducted a review and evaluation of critical infrastructure within the jurisdiction. Within the scope of this document, the department defined critical infrastructure as a facility or asset necessary to support the mission essential functions of the government, provide essential services or effectively respond to a disaster or emergency. These facilities or assists include, but are not limited to, public health, telecommunication, educational, water & utilities, information technology, transportation, postal and shipping, cultural, or emergency services.

Due to the sensitive nature of some of this information, details regarding addresses or facility name are withheld for security purposes. Table 8.1 that provides the number of facilities within each planning zone and station area.

Table 8.1	PZ1	PZ2	PZ3	PZ4	PZ5	PZ6	PZ7	PZ8	PZ9	Total
Station 151	34	3	0	0	0	0	0	0	1	38
Station 152	0	0	0	0	0	0	6	0	0	6
Station 153	0	0	7	0	0	0	0	0	0	7
Station 154	0	0	0	20	0	0	0	0	2	22
Station 155	0	0	0	0	6	1	0	0	0	7
Total	34	3	7	20	6	1	6	0	3	80

9. Conclusions and Recommendations

In conclusion, the Department's current deployment model supports its mission to provide "*High Customer Satisfaction* – through quality preparation and excellent service". Given the recent, continued and expected growth within the community, CRFD must remain an active participant in the planning and construction phases of all development projects (residential and commercial). By doing so, the department can better anticipate response needs, challenges, and potential risks. This will also enable the department to act on the thresholds established in the 2021 Fire Master Plan and advise Town leadership and Town Council of upcoming resources needs.

The result of the 2021 Hazardous Materials Commodity Flow study showed a noticeable decrease in hazardous material product and commercial vehicle traffic through the jurisdiction. There could be several reasons for this decrease. First, based on the department's 2021 Daytime Population Study, there was an appreciable decrease in overall traffic between 2019 and 2020. This included commercial vehicles. Second, the decrease could be a result of a decrease in consumer demands from the ongoing

COVID-19 pandemic requiring few product shipments. Third, during the evaluation period, there was a national shortage of commercial truck drivers that likely resulted in fewer trucks on the road. Lastly, during the evaluation period, there was an extended closure of Interstate 70 in the Glenwood Canyon area. This closure required a four-to-six hour detour for all vehicles on much smaller roads. Given that I-70 is the only east-west interstate through Colorado, this potentially changed long-haul traffic routes bypassing portions of the I-25 corridor.

The CRFD uses several software systems and mobile applications, many of which do not have the capability to effectively share information back and forth. One such limitation that became evident in the fire risk analysis was the sharing of information between the Life Safety Division and Operations. The Fire Prevention Officers (FPO) complete an OVAP source in one application. However, that information is not readily available on the application the Operations staff use during their responses. Attempts have been made to link the systems, but ultimately, it was unsuccessful. Currently, all "Special Risk" structures are manually entered into the First Due size up application to ensure responding personnel are aware of unique issues within certain buildings.

The risk of wildland interface fires is ever present throughout the region. The department maintains an active wildland team and all members meet or exceed National Wildfire Coordinating Group (NWCG) requirements for Firefighter 1. The department has recently completed the draft of a Community Wildfire Protection Plan (CWPP). The CWPP would consist of a detailed risk assessment and several mitigation plans. Once approved by the Town of Castle Rock Town Council, the department can begin mitigation efforts.

As a result of this risk assessment, the team identified four recommendations that will help the department meet its vision "*To Be the Best* – at providing emergency and prevention services".

Based on the findings within this risk assessment, it is the recommendation of the Department to:

- Actively participate with other Town departments in the development and planning phases to ensure and plan for fire and emergency responses
- Consider an expanded hazardous materials commodity flow study that provides a more comprehensive overview of the materials being transported through the jurisdiction.
- Develop a sustainable methodology to ensure all new and updated commercial occupancies are evaluated using the current assessment model (OVAP), and ensure significant or special risks facilities are easily identified for response personnel.
- Consistent with 2020 – 2024 Strategic Goal 2020-03, develop, adopt, and implement a Community Wildland Protection Program (CWPP)

Additionally, given the recent and expected growth within the community, the department will be constantly challenged to ensure the proper resources (staffing, equipment, and fixed facilities) are available.

Appendix A International Code Council (2012) Table B105.1

APPENDIX B

TABLE B105.1
MINIMUM REQUIRED FIRE-FLOW AND FLOW DURATION FOR BUILDINGS

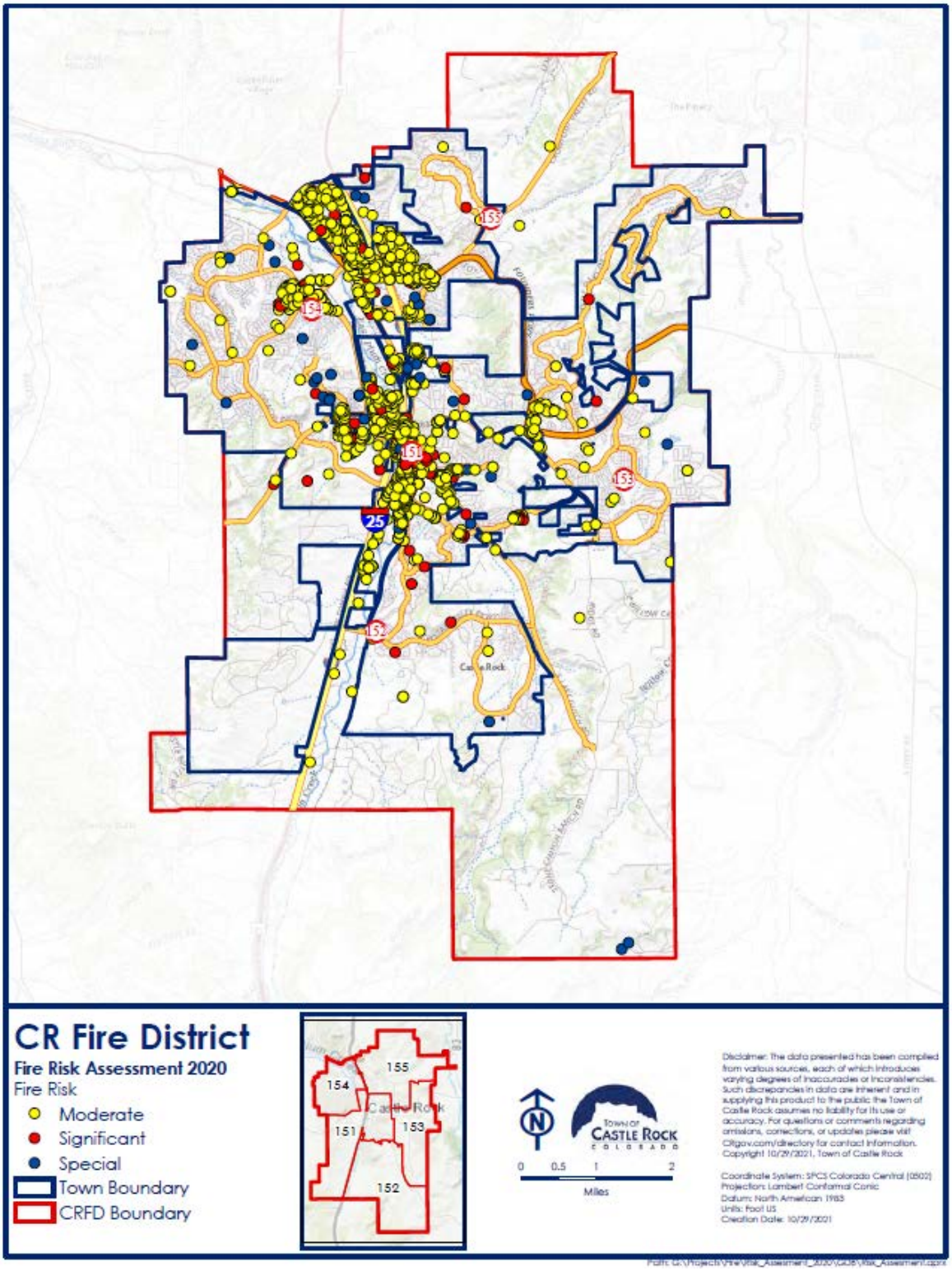
FIRE-FLOW CALCULATION AREA (square feet)					FIRE-FLOW (gallons per minute)[b]	FLOW DURATION (hours)
Type IA and IB[a]	Type IIA and IIIA[a]	Type IV and V-A[a]	Type IIB and IIIB[a]	Type V-B[a]		
0-22,700	0-12,700	0-8,200	0-5,900	0-3,600	1,500	2
22,701-30,200	12,701-17,000	8,201-10,900	5,901-7,900	3,601-4,800	1,750	
30,201-38,700	17,001-21,800	10,901-12,900	7,901-9,800	4,801-6,200	2,000	
38,701-48,300	21,801-24,200	12,901-17,400	9,801-12,600	6,201-7,700	2,250	
48,301-59,000	24,201-33,200	17,401-21,300	12,601-15,400	7,701-9,400	2,500	
59,001-70,900	33,201-39,700	21,301-25,500	15,401-18,400	9,401-11,300	2,750	
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3,000	3
83,701-97,700	47,101-54,900	30,101-35,200	21,801-25,900	13,401-15,600	3,250	
97,701-112,700	54,901-63,400	35,201-40,600	25,901-29,300	15,601-18,000	3,500	
112,701-128,700	63,401-72,400	40,601-46,400	29,301-33,500	18,001-20,600	3,750	
128,701-145,900	72,401-82,100	46,401-52,500	33,501-37,900	20,601-23,300	4,000	4
145,901-164,200	82,101-92,400	52,501-59,100	37,901-42,700	23,301-26,300	4,250	
164,201-183,400	92,401-103,100	59,101-66,000	42,701-47,700	26,301-29,300	4,500	
183,401-203,700	103,101-114,600	66,001-73,300	47,701-53,000	29,301-32,600	4,750	
203,701-225,200	114,601-126,700	73,301-81,100	53,001-58,600	32,601-36,000	5,000	
225,201-247,700	126,701-139,400	81,101-89,200	58,601-65,400	36,001-39,600	5,250	
247,701-271,200	139,401-152,600	89,201-97,700	65,401-70,600	39,601-43,400	5,500	
271,201-295,900	152,601-166,500	97,701-106,500	70,601-77,000	43,401-47,400	5,750	
295,901-Greater	166,501-Greater	106,501-115,800	77,001-83,700	47,401-51,500	6,000	
—	—	115,801-125,500	83,701-90,600	51,501-55,700	6,250	
—	—	125,501-135,500	90,601-97,900	55,701-60,200	6,500	
—	—	135,501-145,800	97,901-106,800	60,201-64,800	6,750	
—	—	145,801-156,700	106,801-113,200	64,801-69,600	7,000	
—	—	156,701-167,900	113,201-121,300	69,601-74,600	7,250	
—	—	167,901-179,400	121,301-129,600	74,601-79,800	7,500	
—	—	179,401-191,400	129,601-138,300	79,801-85,100	7,750	
—	—	191,401-Greater	138,301-Greater	85,101-Greater	8,000	

For SI: 1 square foot = 0.0929 m², 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.
a. Types of construction are based on the *International Building Code*.
b. Measured at 20 psi residual pressure.

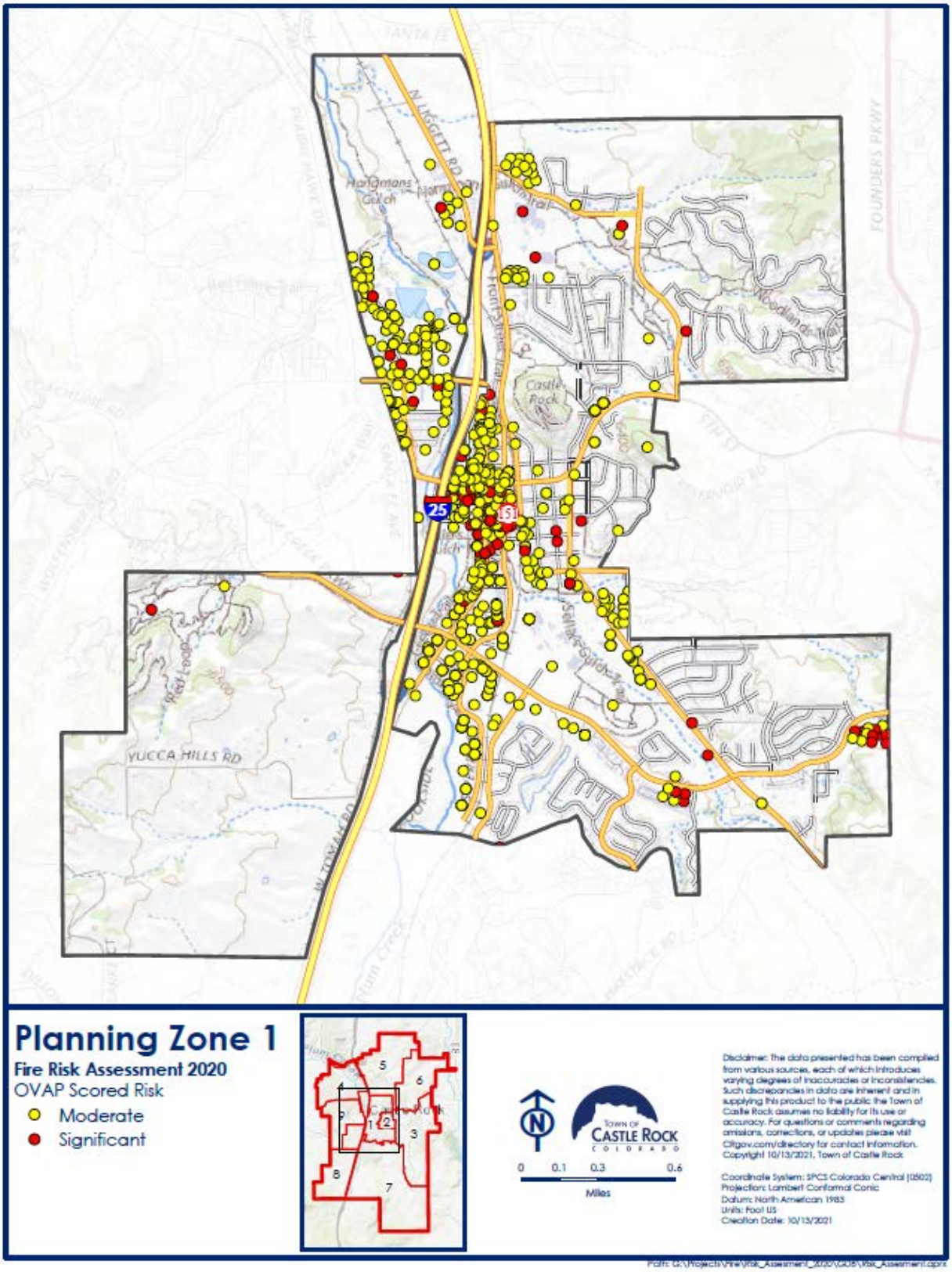
526 2012 INTERNATIONAL FIRE CODE WITH PHOENIX AMENDMENTS

Appendix B Fire Risk Assessment Maps

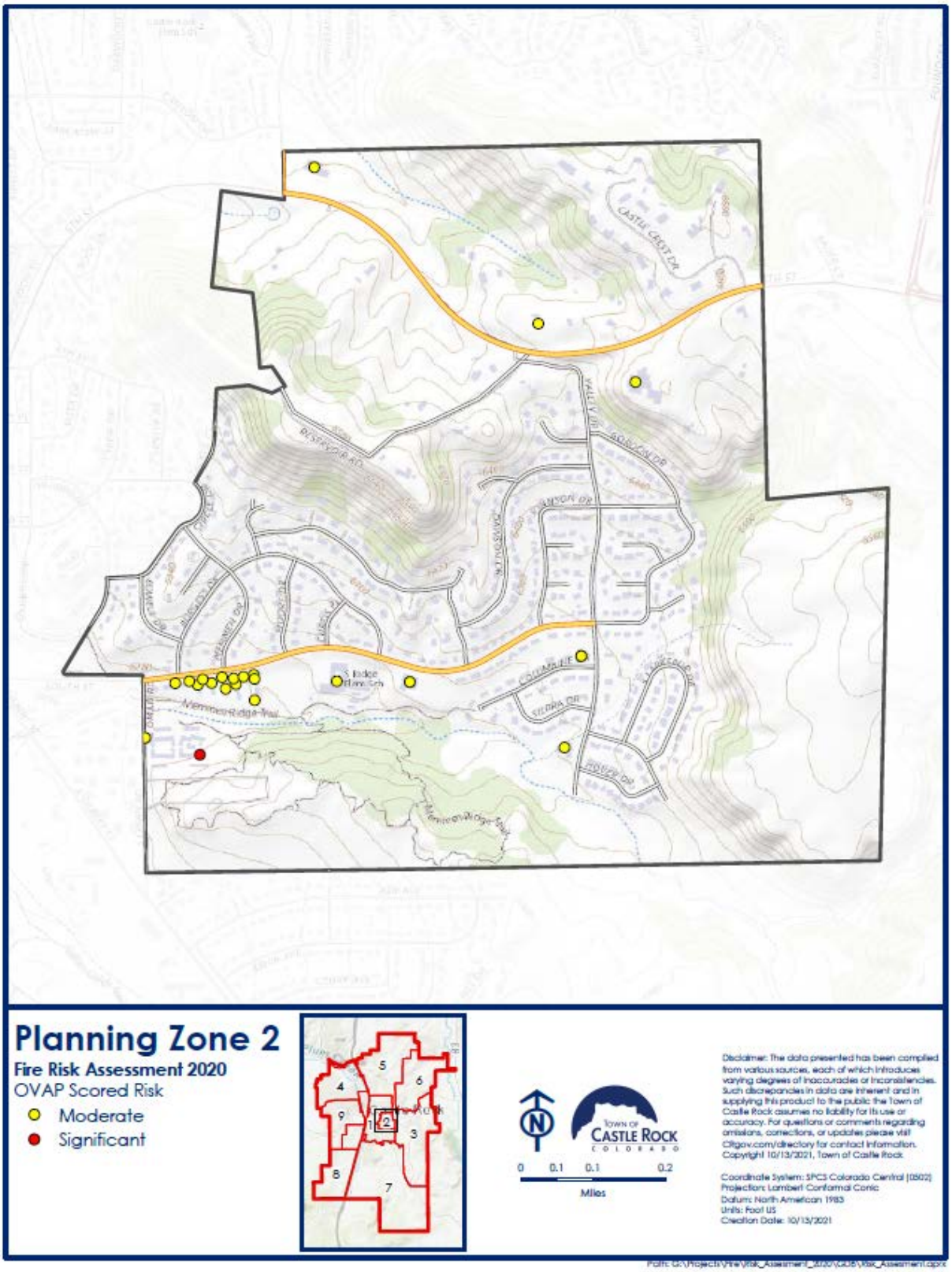
Map 3.1 CRFD Fire Risks (return to Fire Risks)



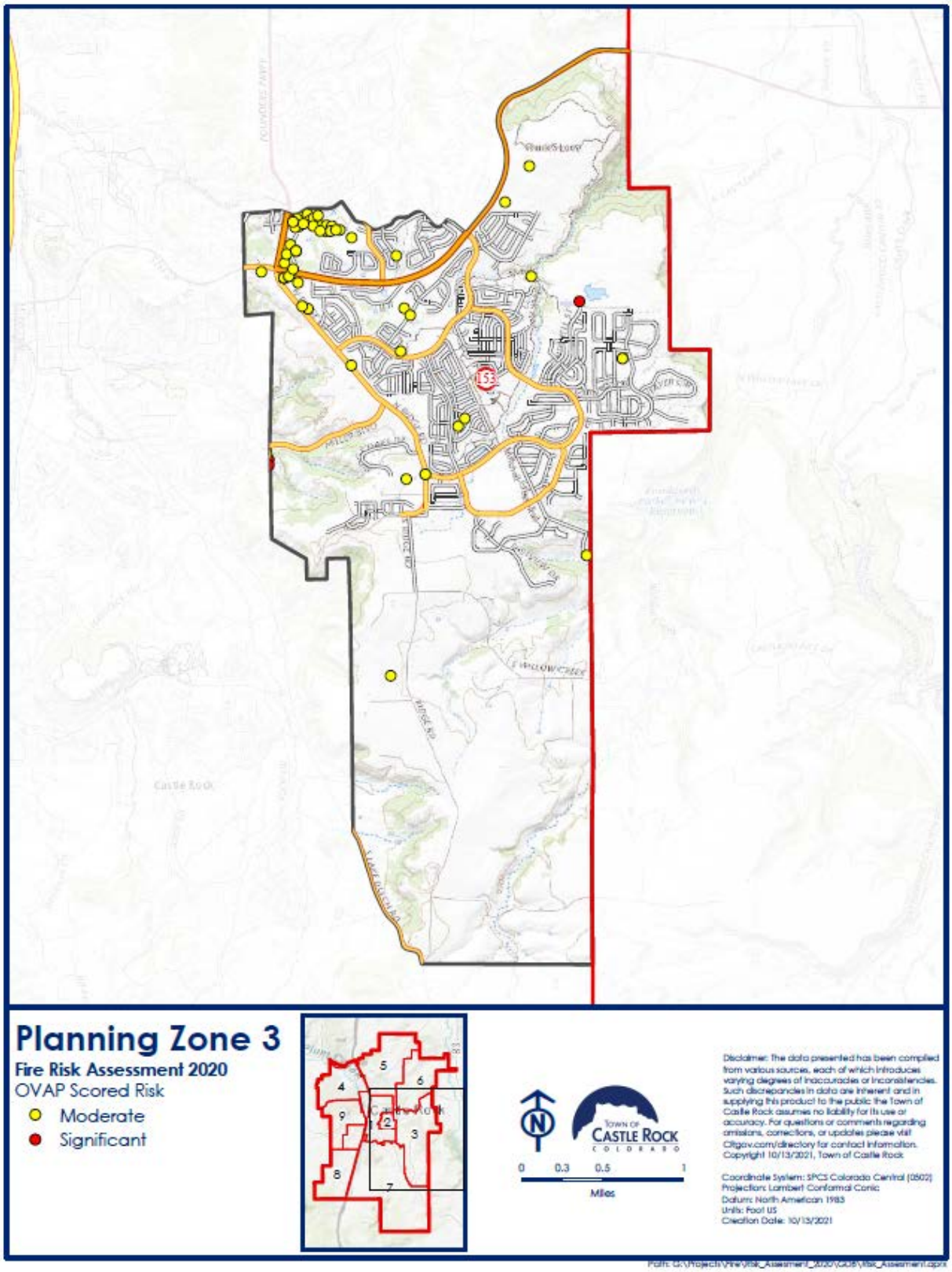
Map 3.2 Fire Risk PZ1 (return to Fire Risks)



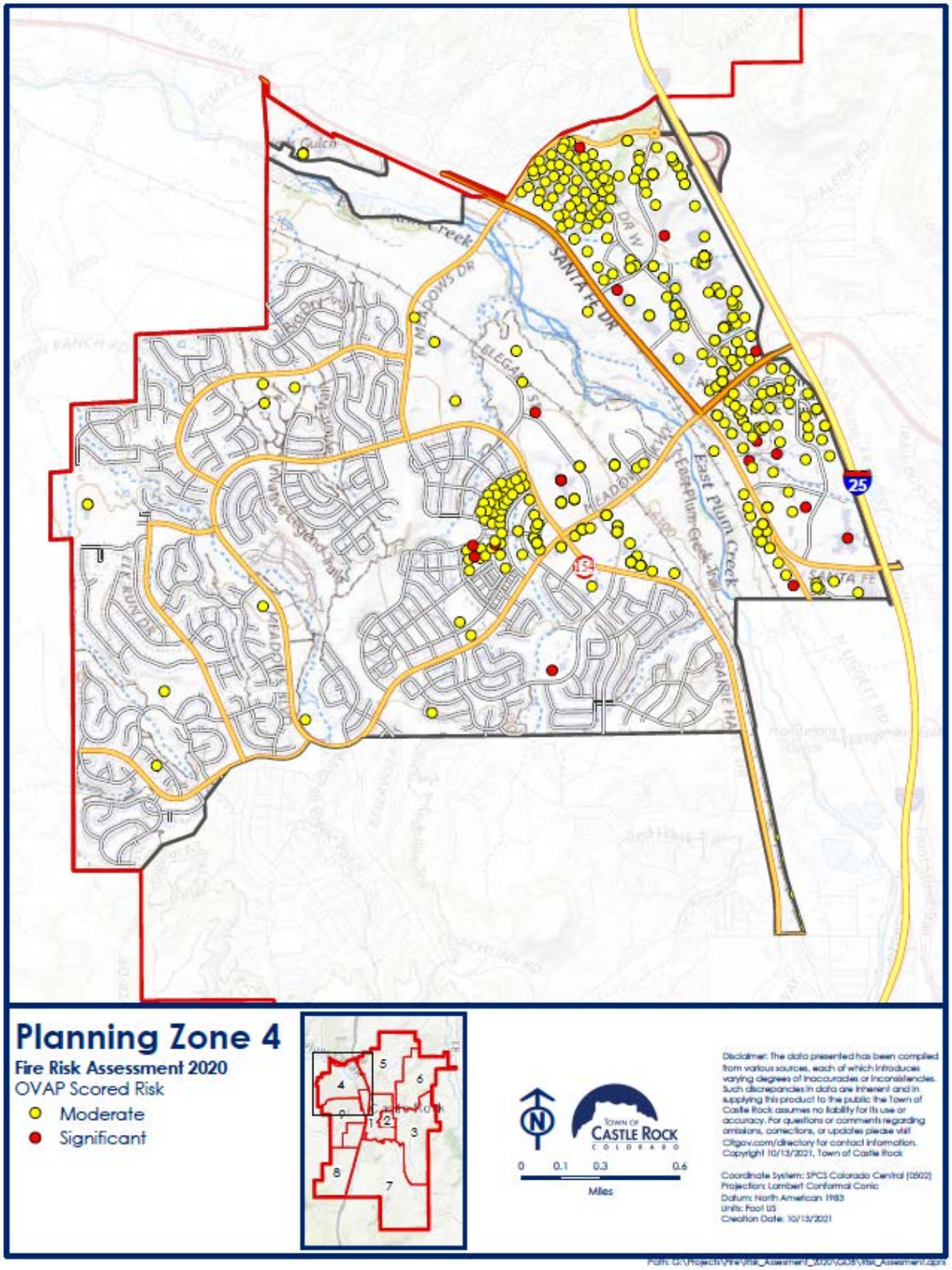
Map 3.3 Fire Risk PZ2 (return to Fire Risks)



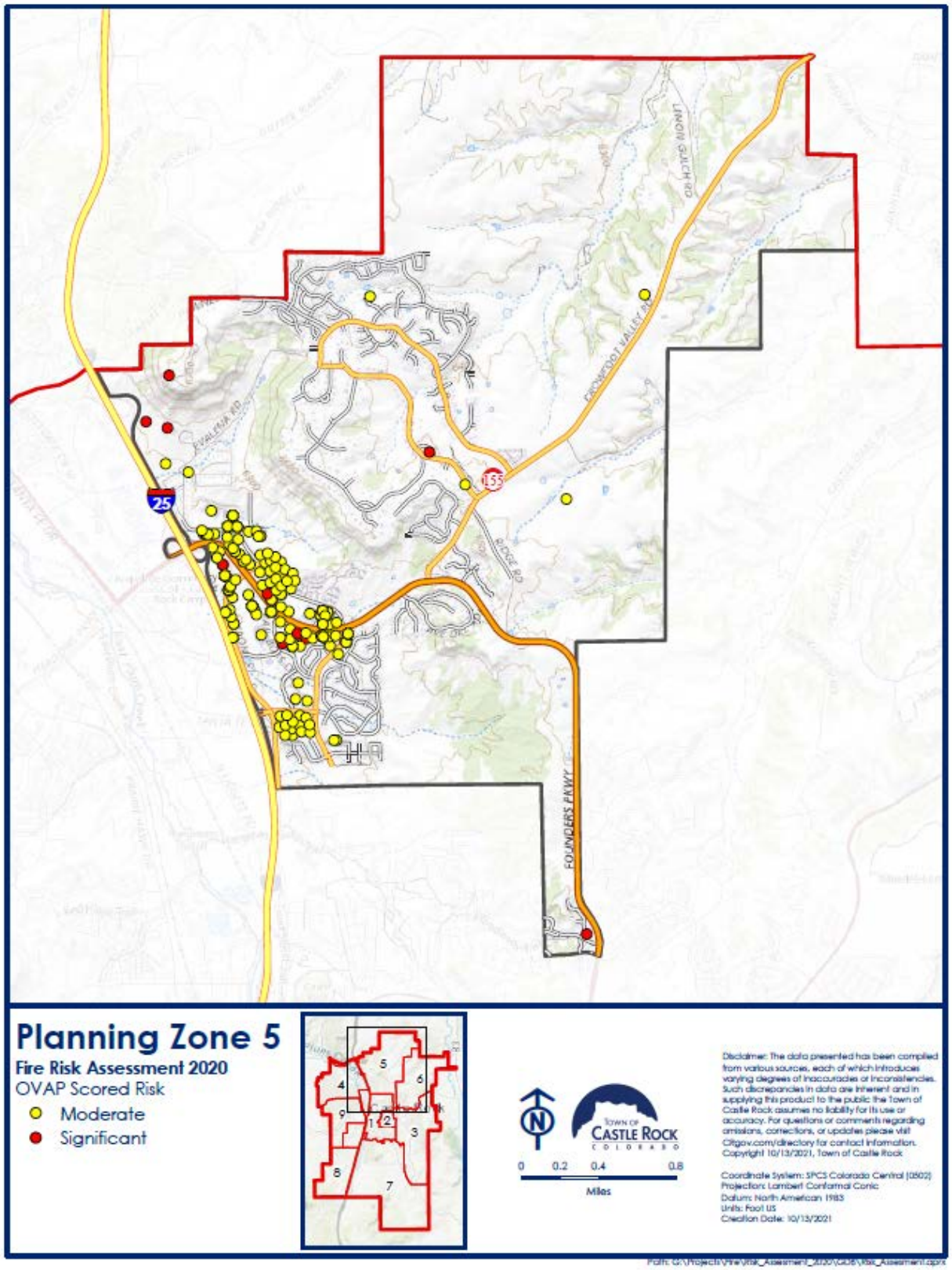
Map 3.4 Fire Risk PZ3 (return to Fire Risks)



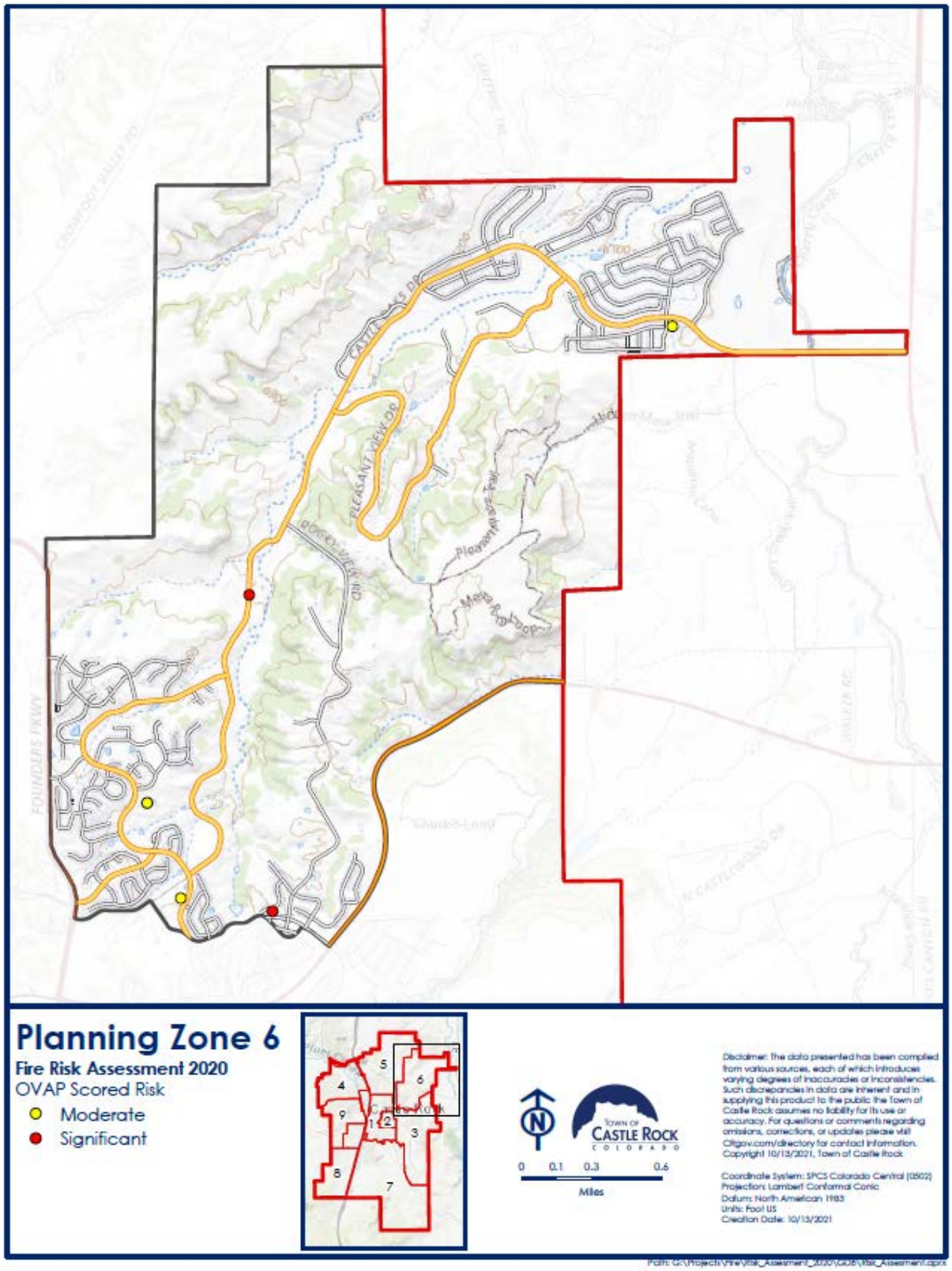
Map 3.5 Fire Risk PZ4 (return to Fire Risks)



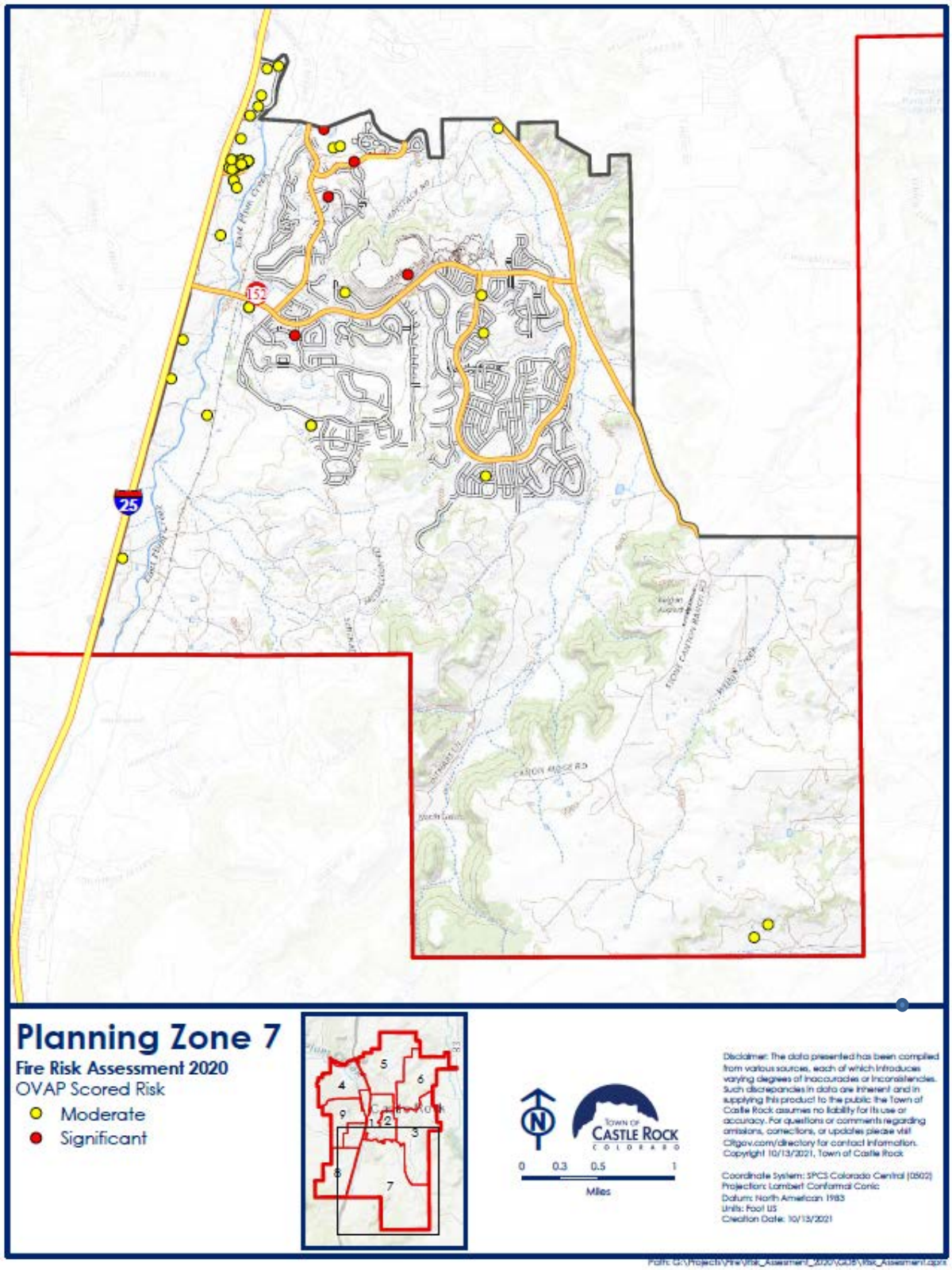
Map 3.5 Fire Risk PZ5 (return to Fire Risks)



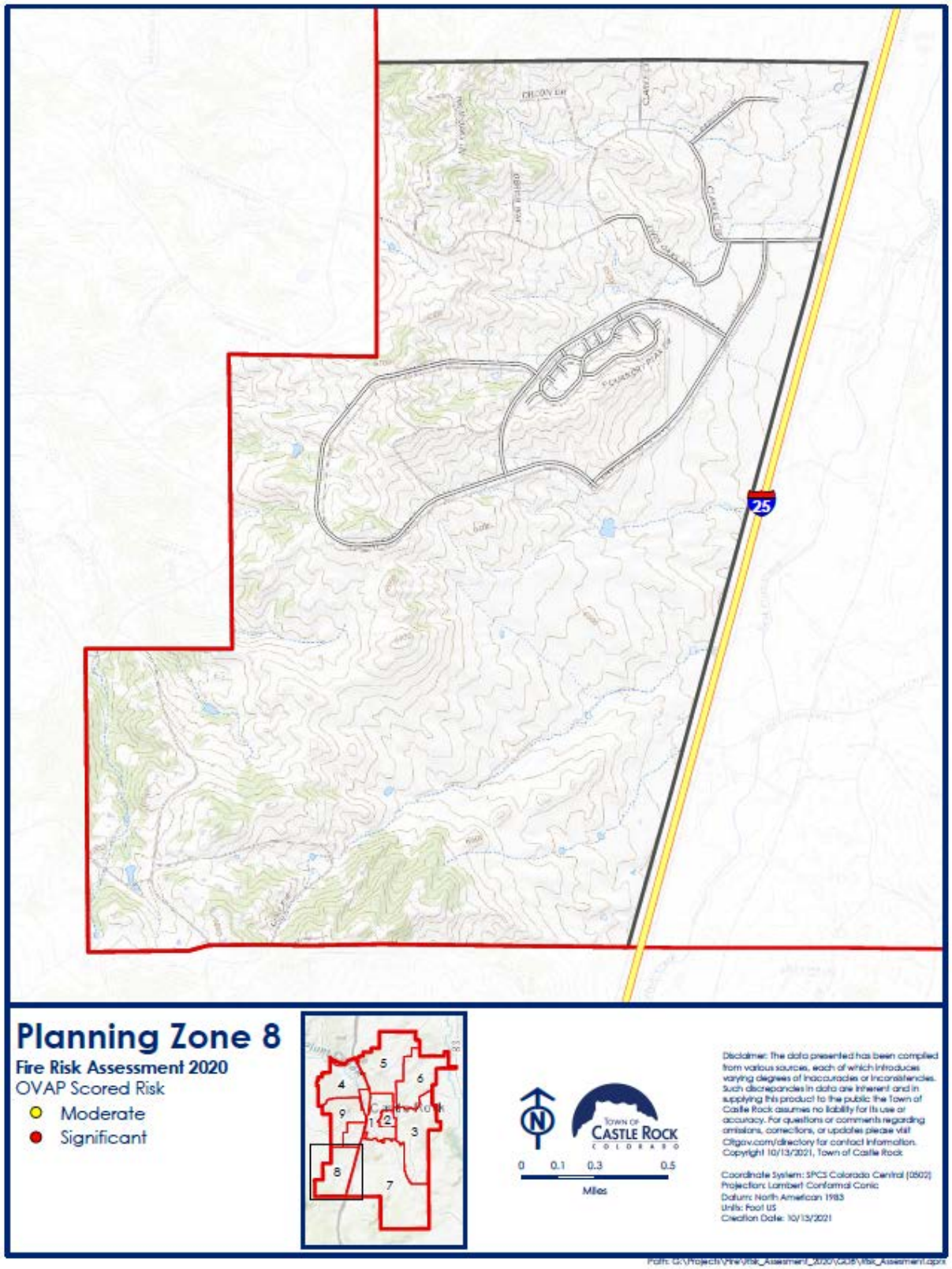
Map 3.7 Fire Risk PZ6 (return to Fire Risks)



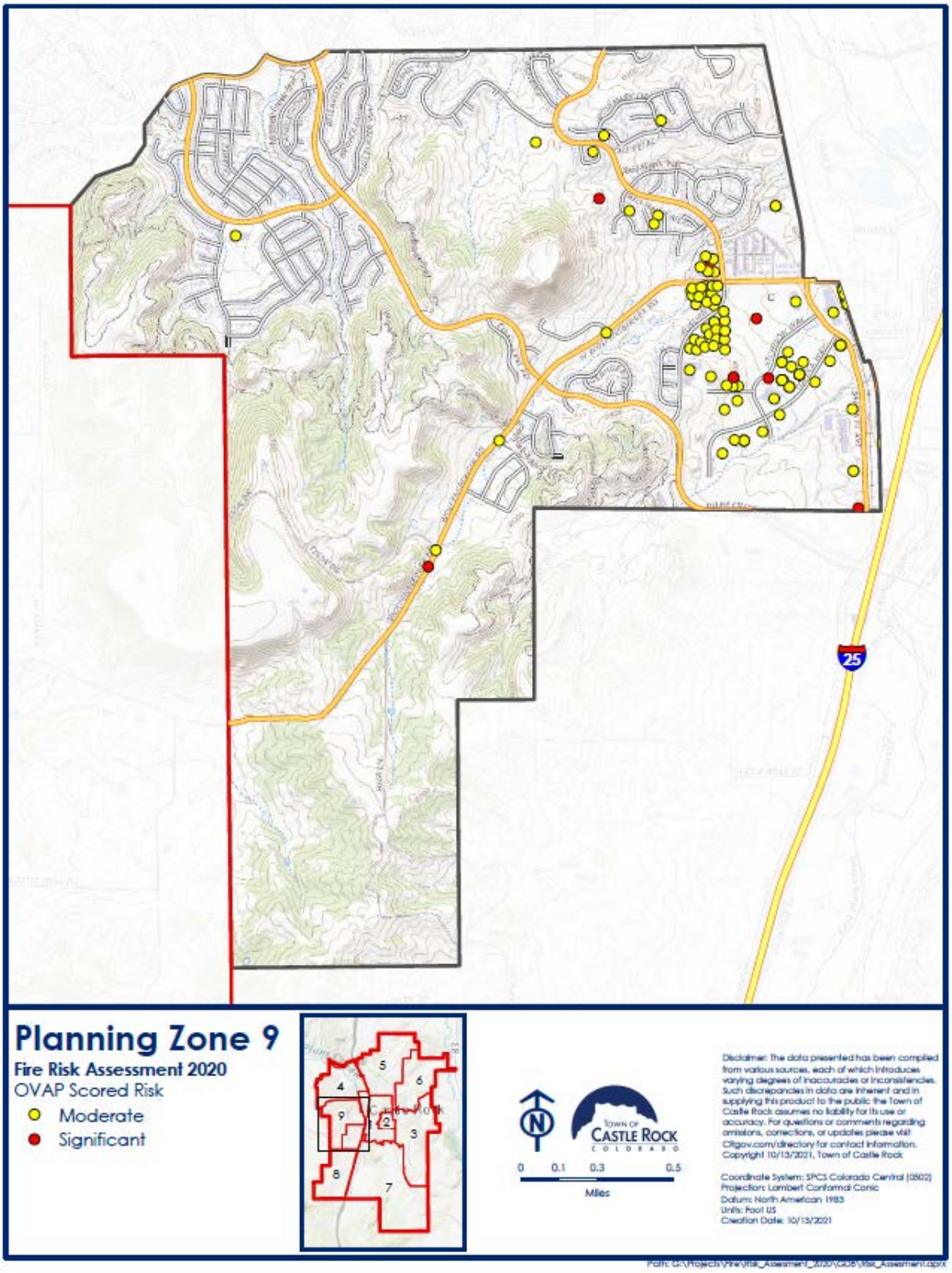
Map 3.8 Fire Risk PZ7 (return to Fire Risks)



Map 3.9 Fire Risk PZ8 (return to Fire Risks)

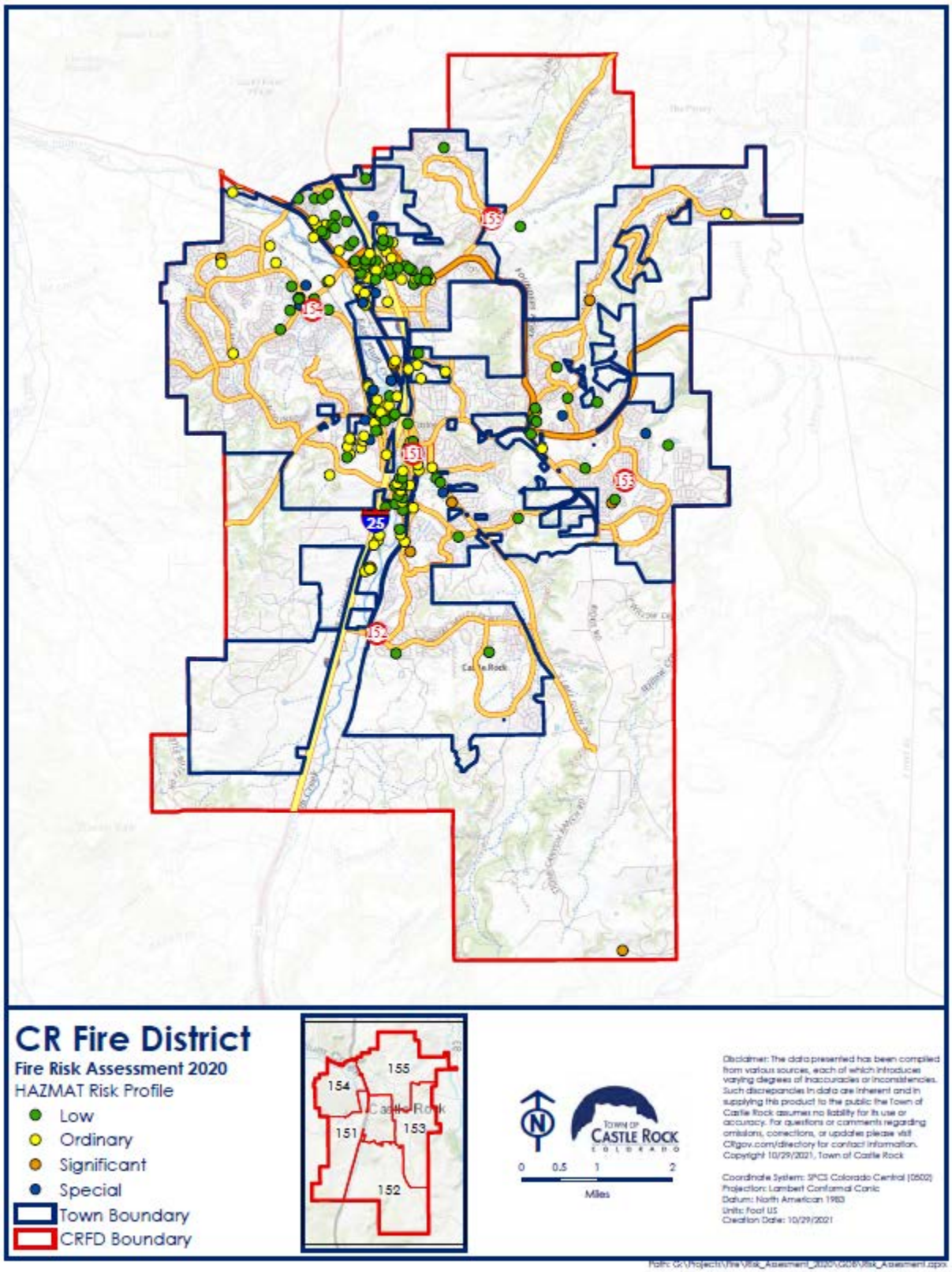


Map 3.10 Fire Risk PZ9 (return to Fire Risks)

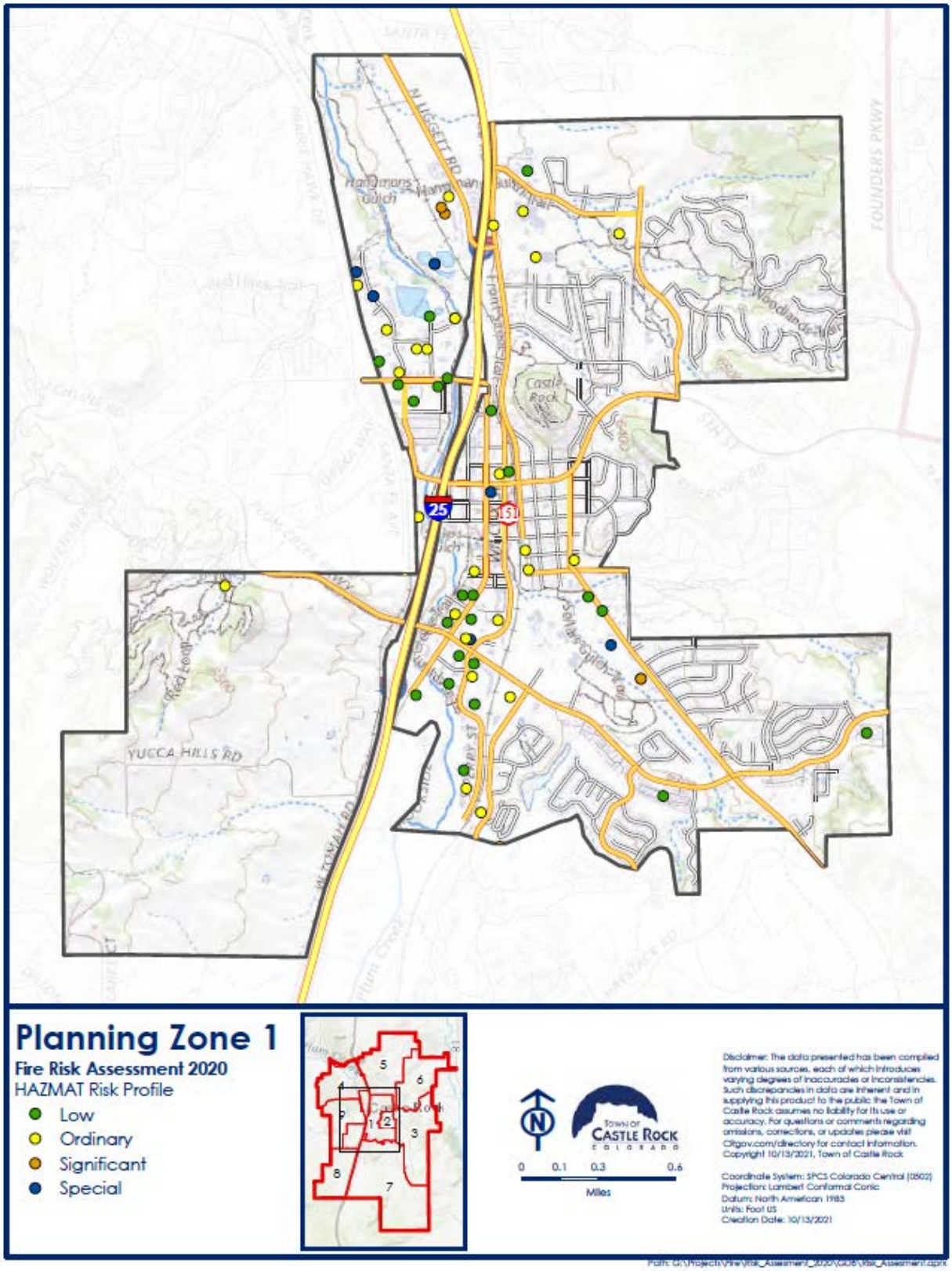


Appendix C HAZMAT Risk Assessment Maps

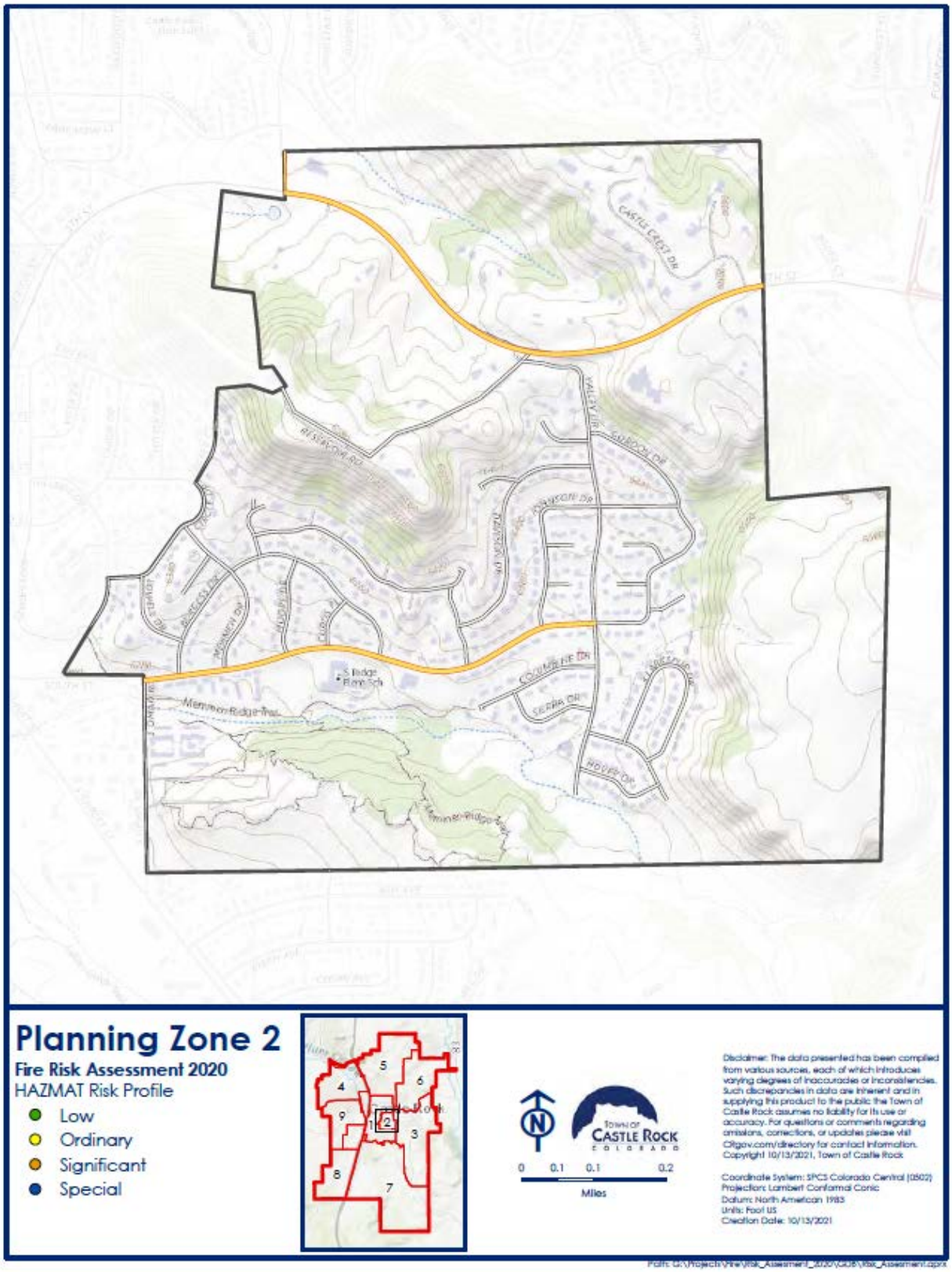
Map 5.1 HAZMAT Risk (return to HAZMAT Risk)



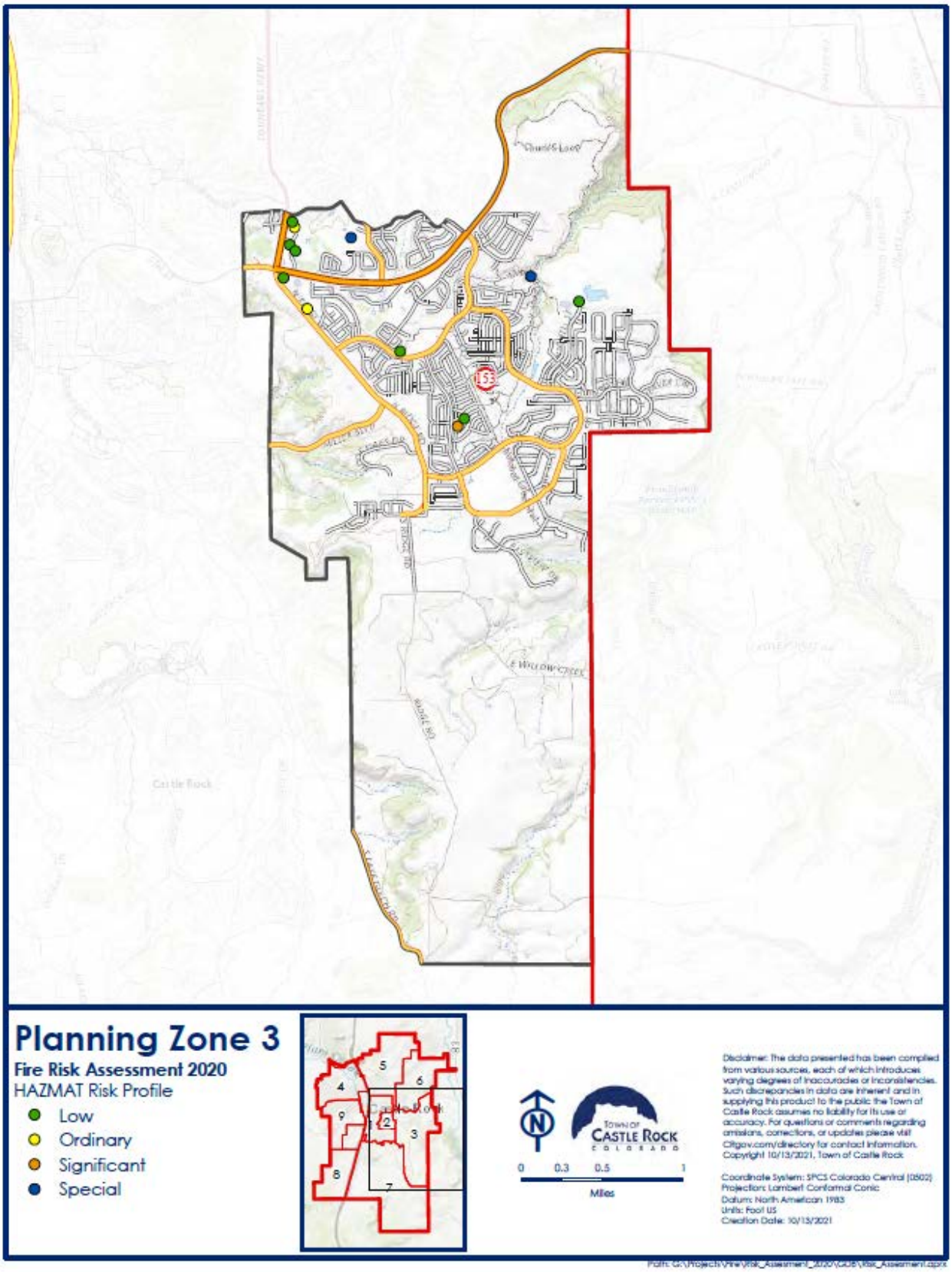
Map 5.2 HAZMAT Risk PZ1 (return to HAZMAT Risk)



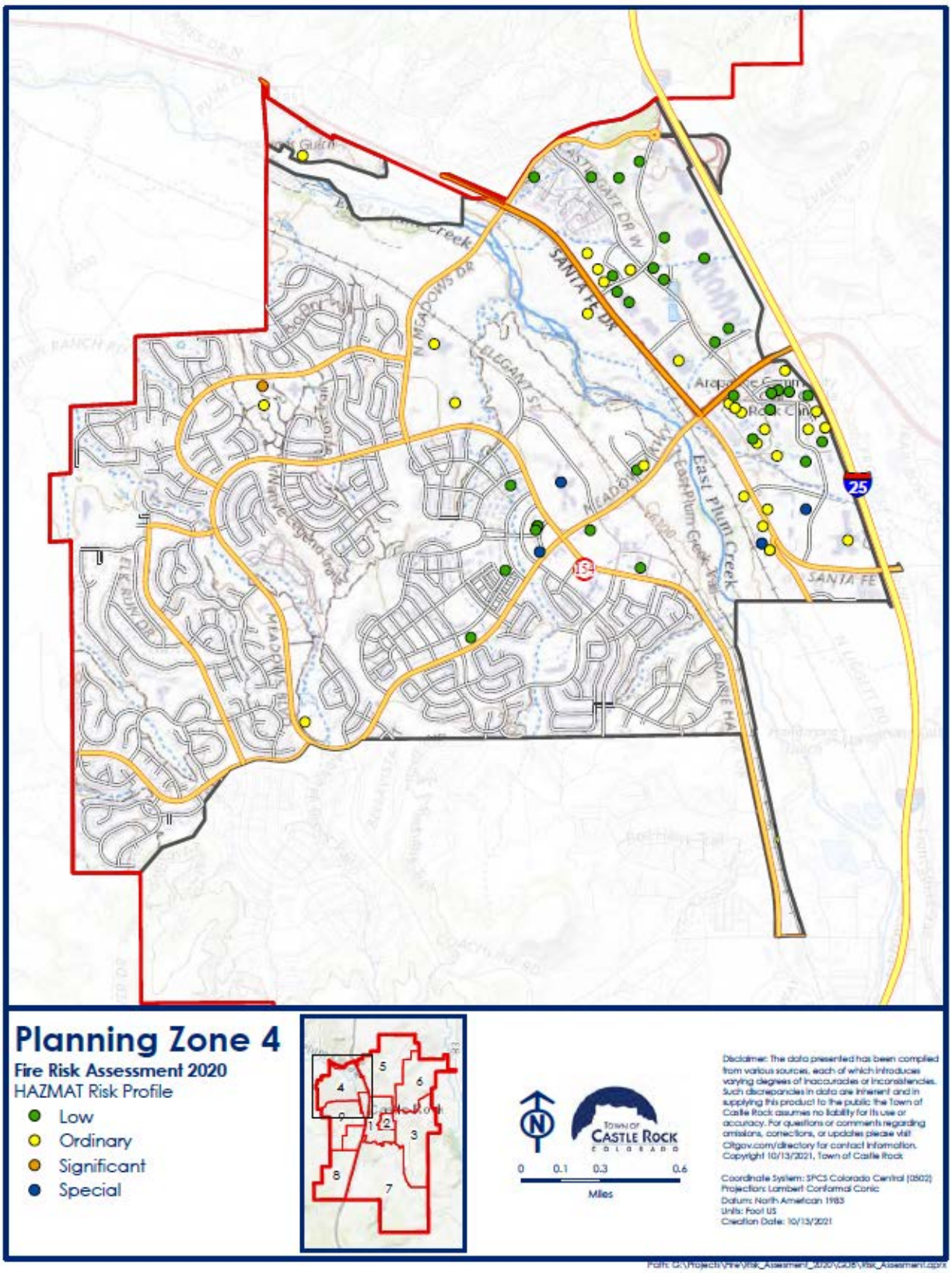
Map 5.3 HAZMAT Risk PZ2 (return to HAZMAT Risk)



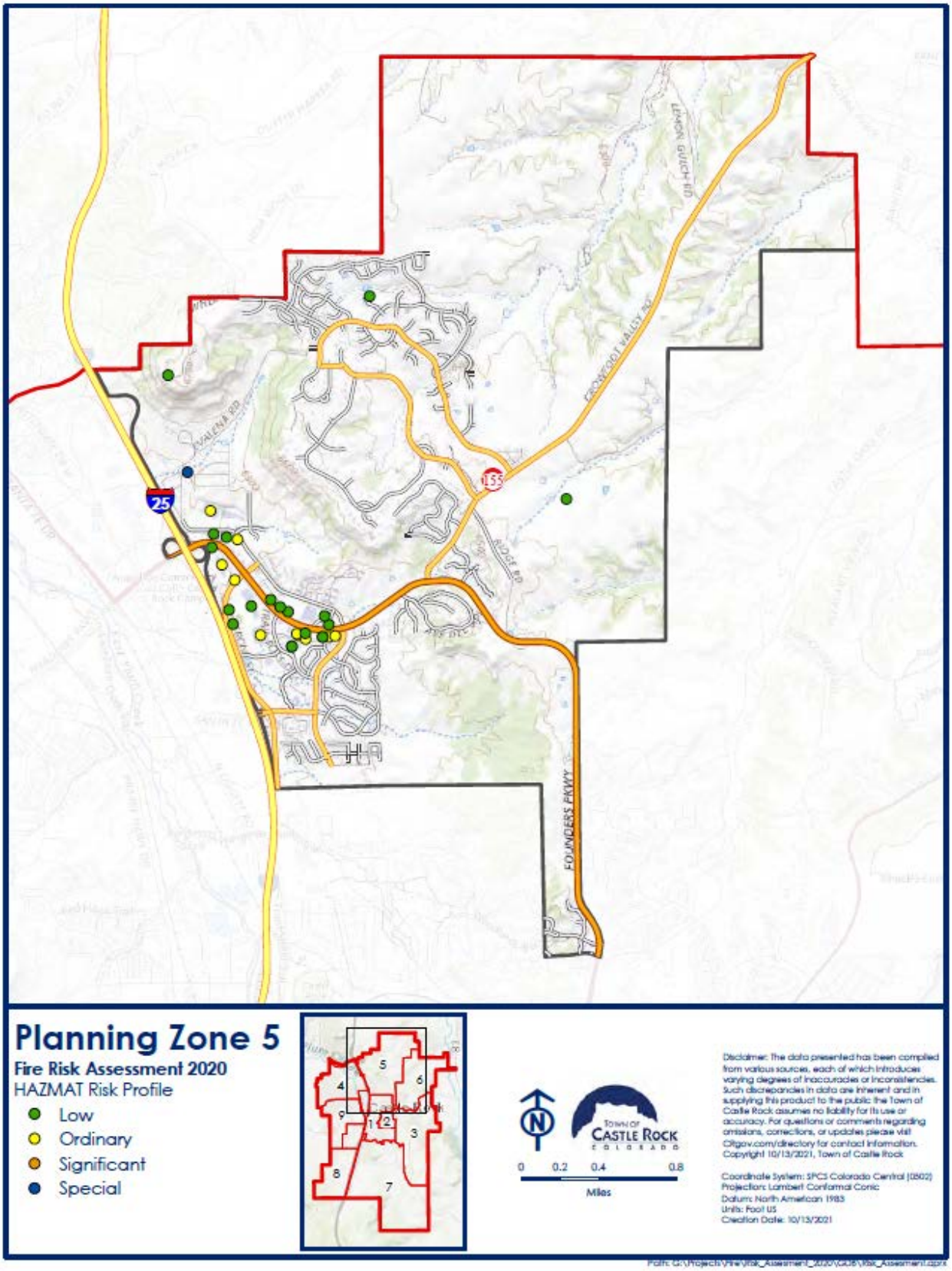
Map 5.4 HAZMAT Risk PZ3 (return to HAZMAT Risk)



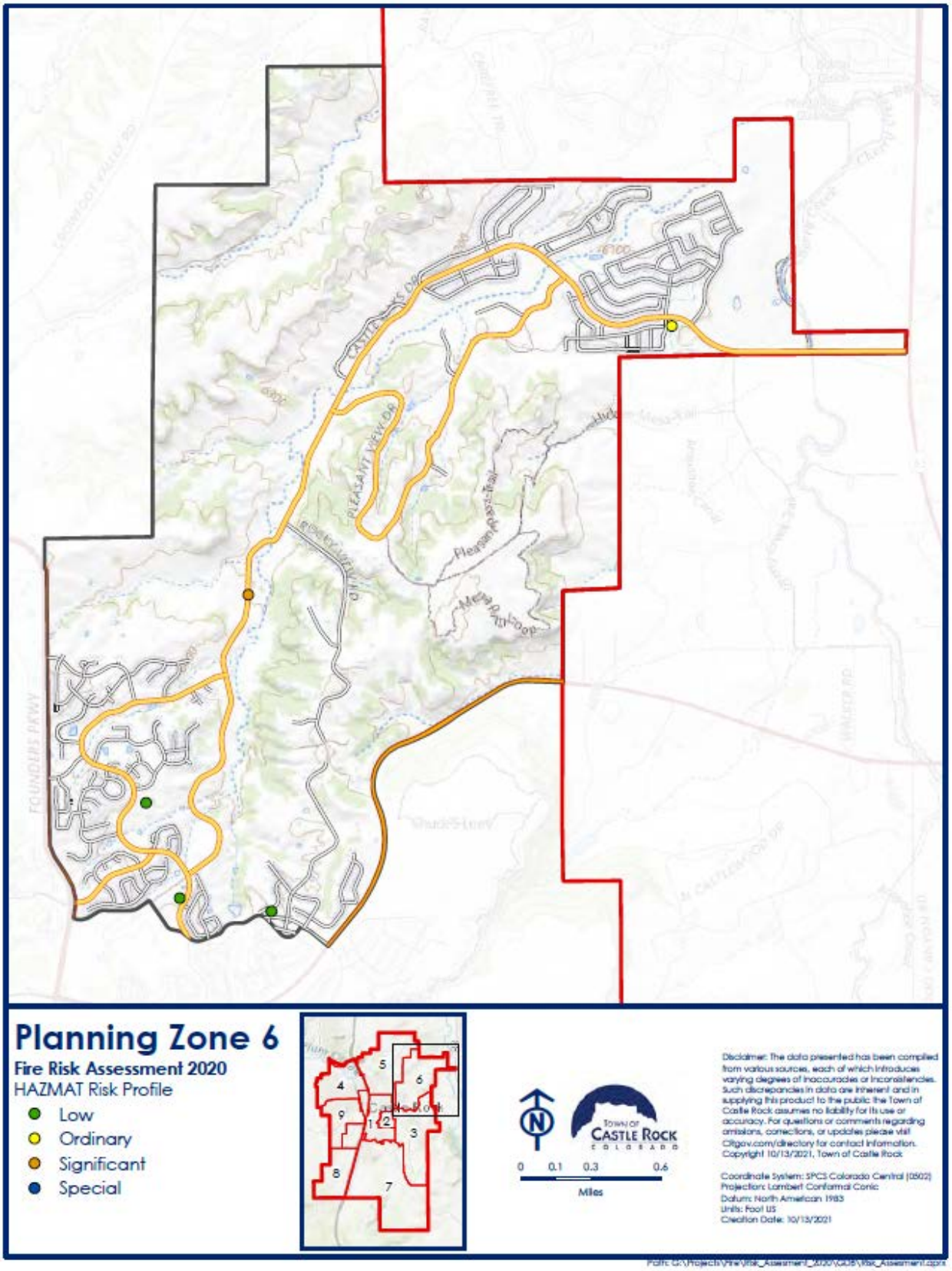
Map 5.5 HAZMAT Risk PZ4 (return to HAZMAT Risk)



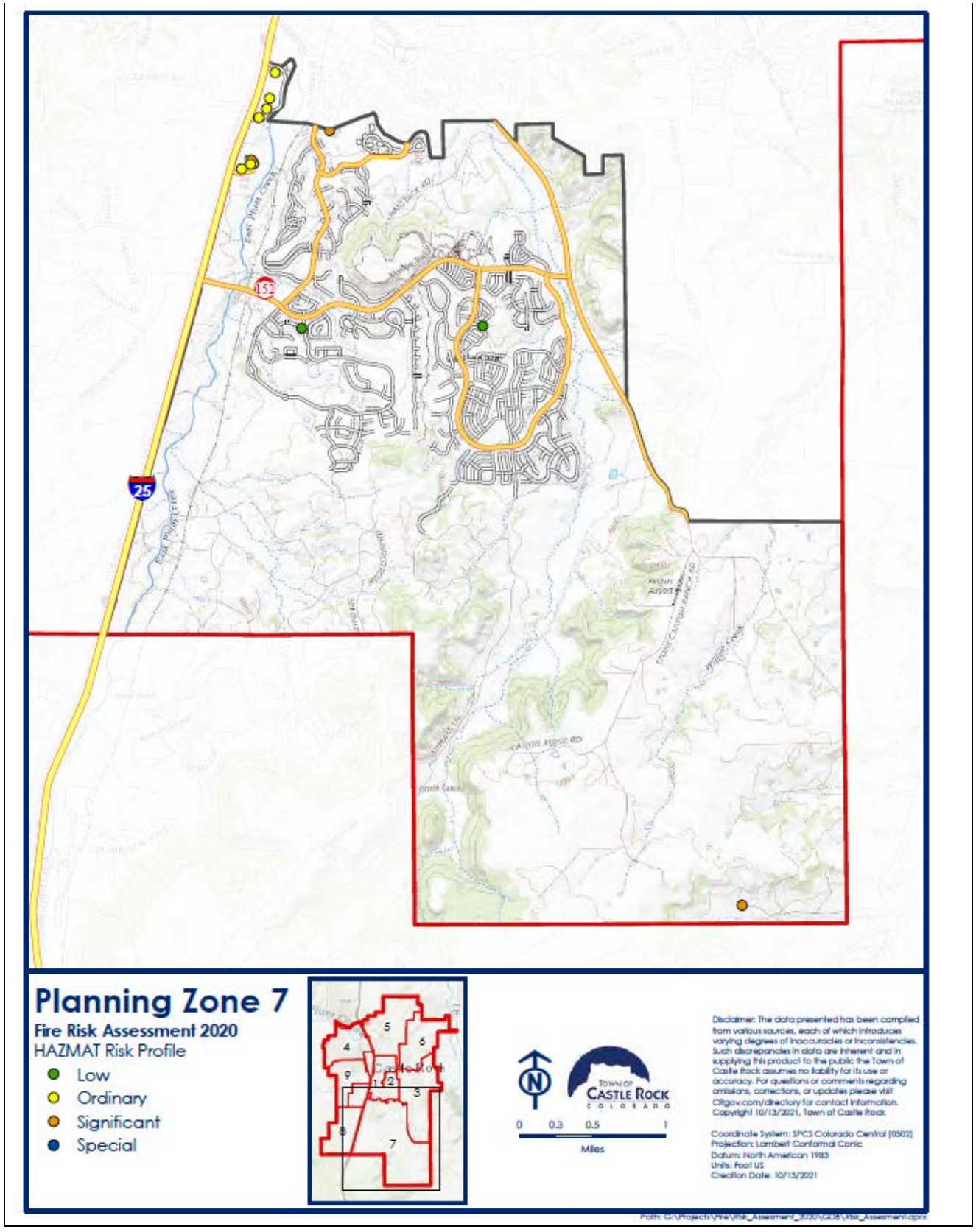
Map 5.6 HAZMAT Risk PZ5 (return to HAZMAT Risk)



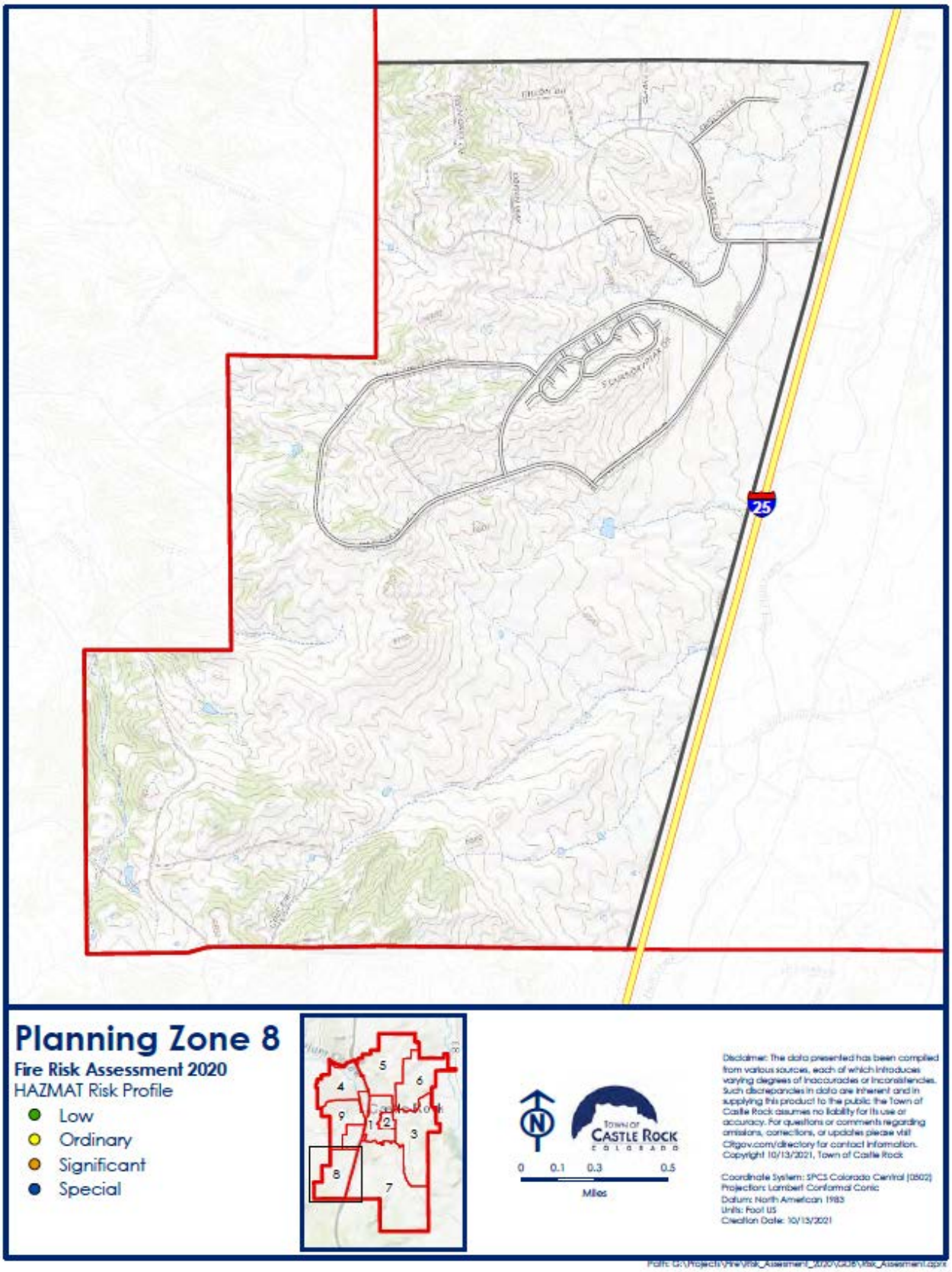
Map 5.7 HAZMAT Risk PZ6 (return to HAZMAT Risk)



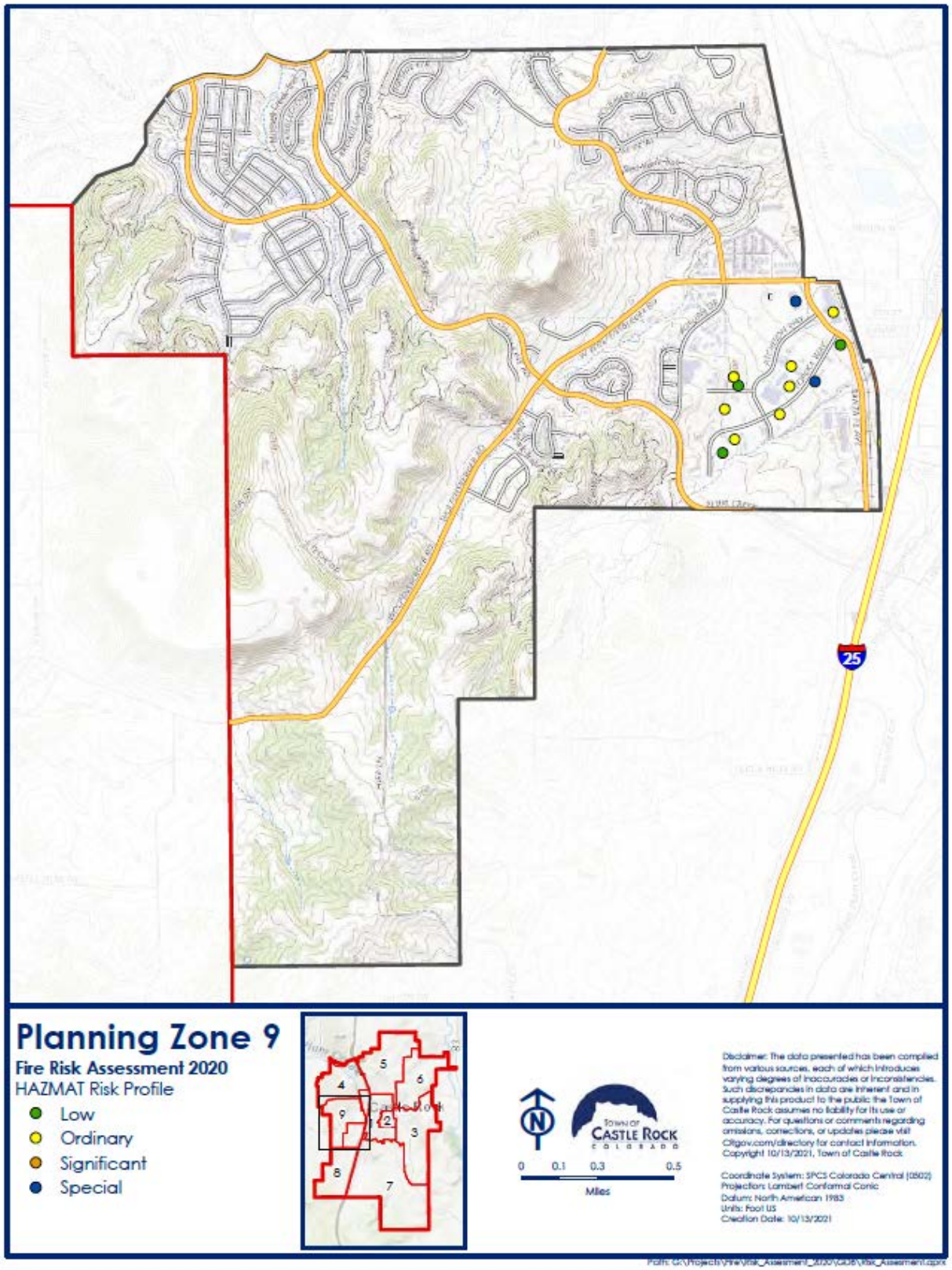
Map 5.8 HAZMAT Risk PZ7 (return to HAZMAT Risk)



Map 5.9 HAZMAT Risk PZ8 (return to HAZMAT Risk)

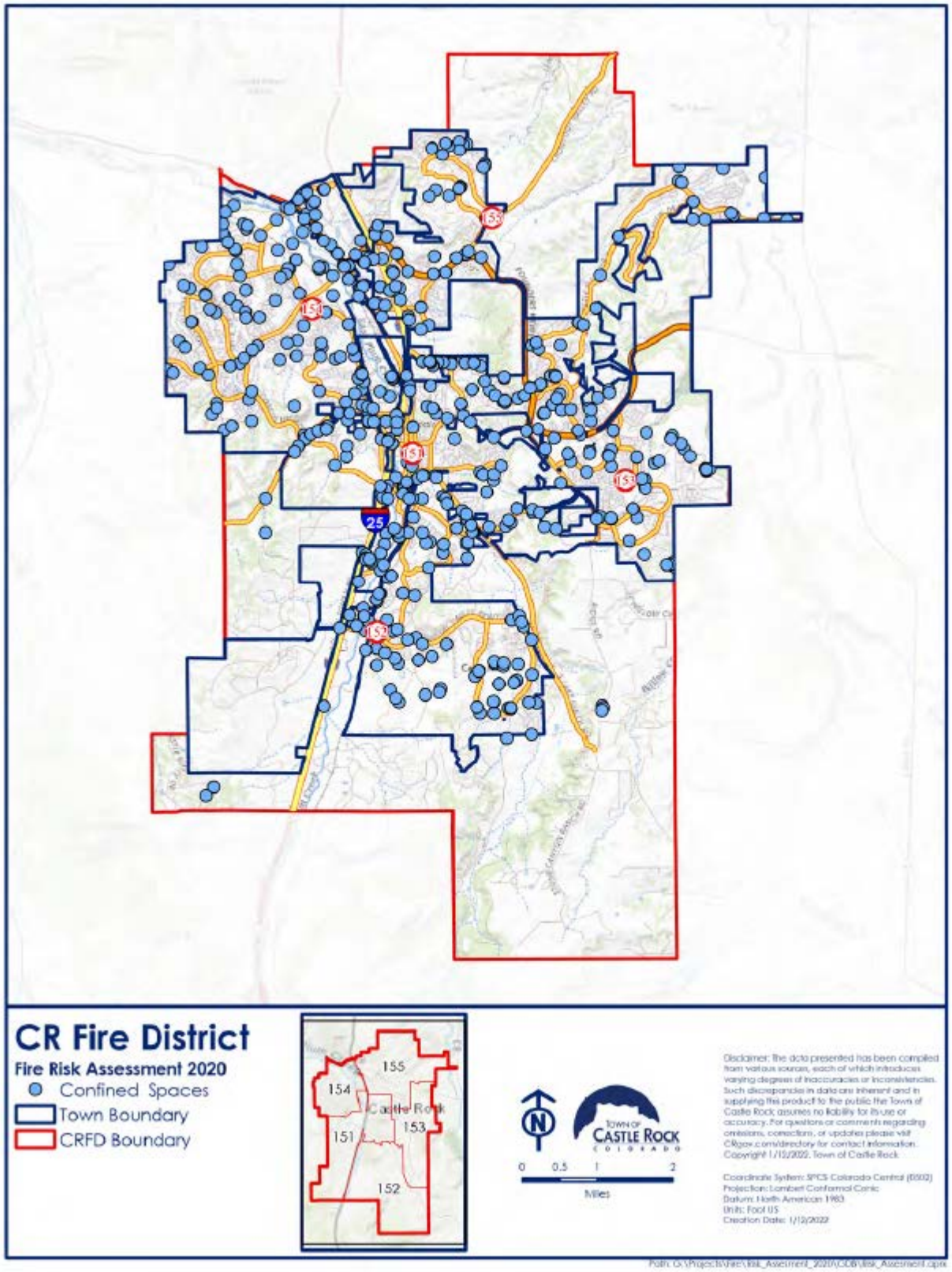


Map 5.10 HAZMAT Risk PZ9 (return to HAZMAT Risk)

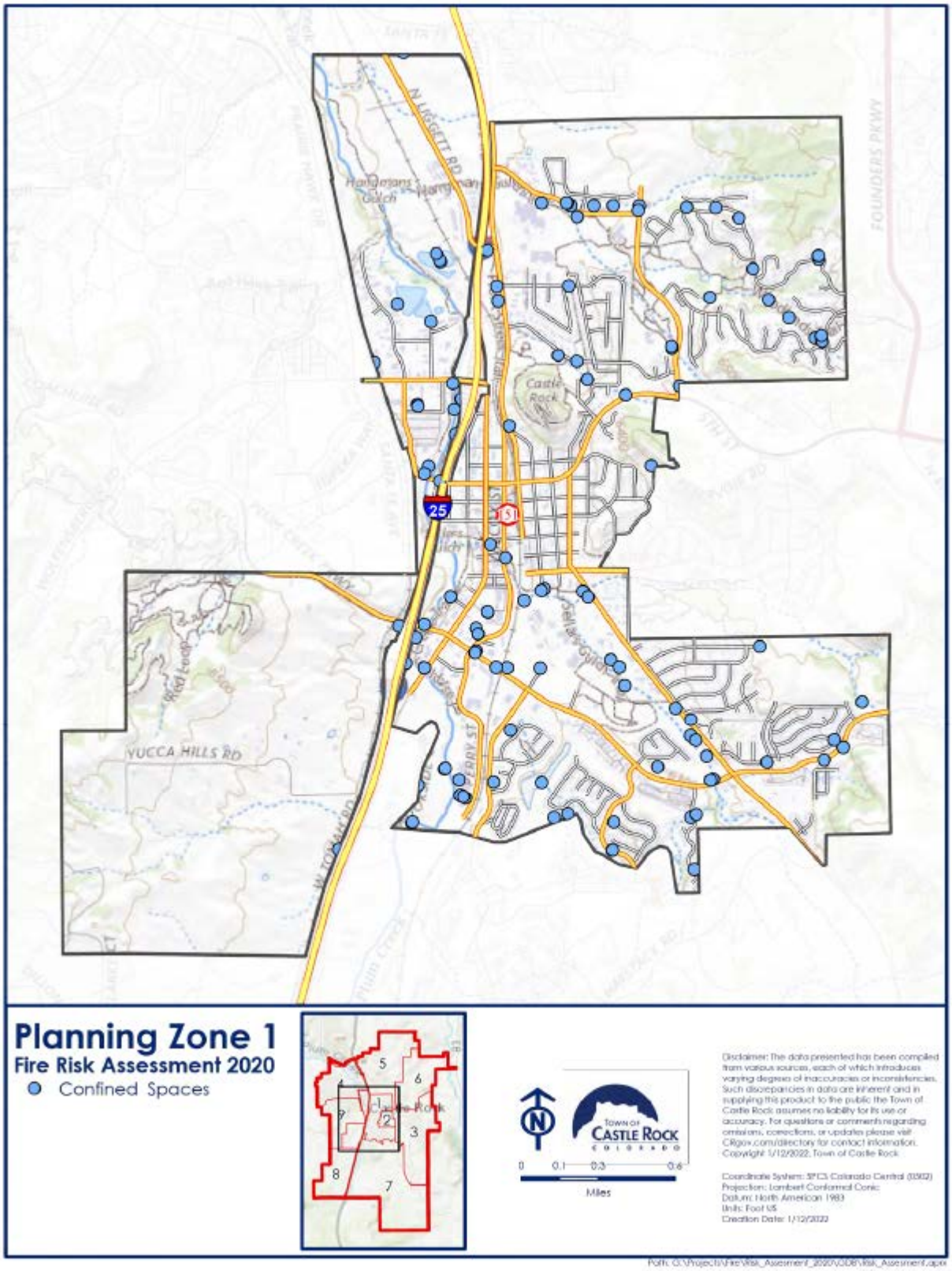


Appendix D Technical Rescue Risk Assessment Maps

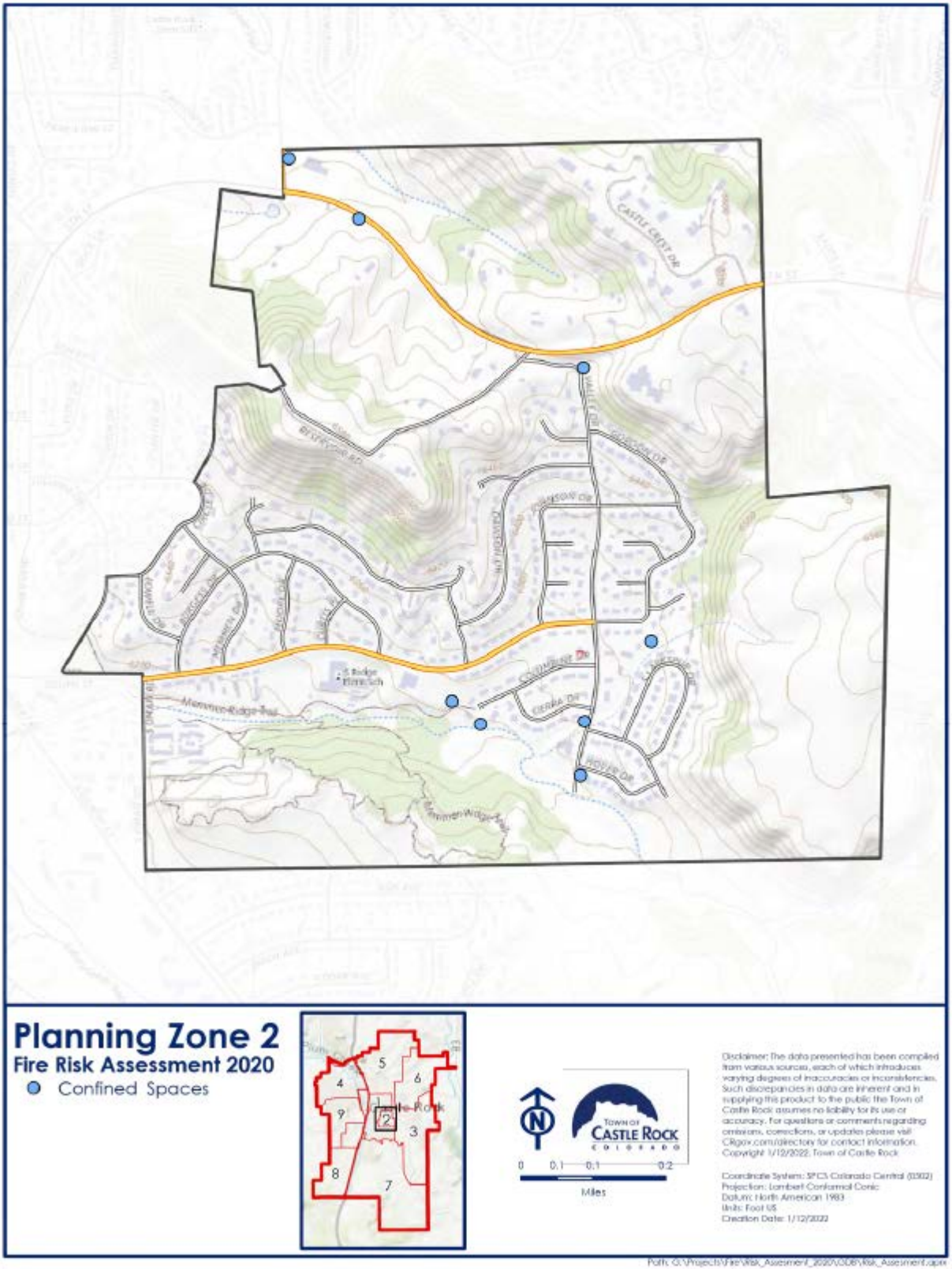
Map 6.1 Confined Space Rescue Risk CRFD (return to Tech Rescue Risks)



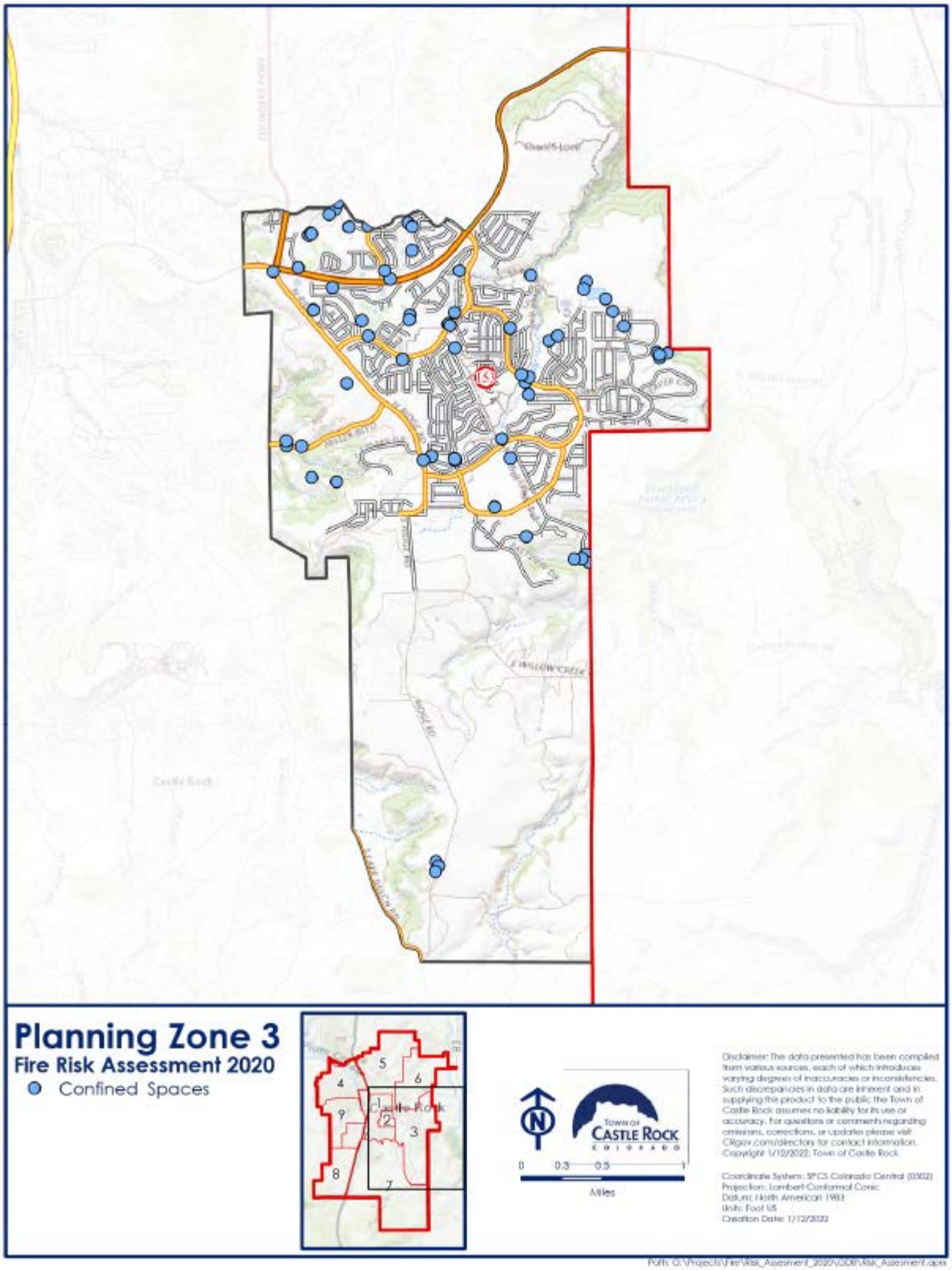
Map 6.2 Confined Space Rescue Risk PZ1 (return to Tech Rescue Risks)



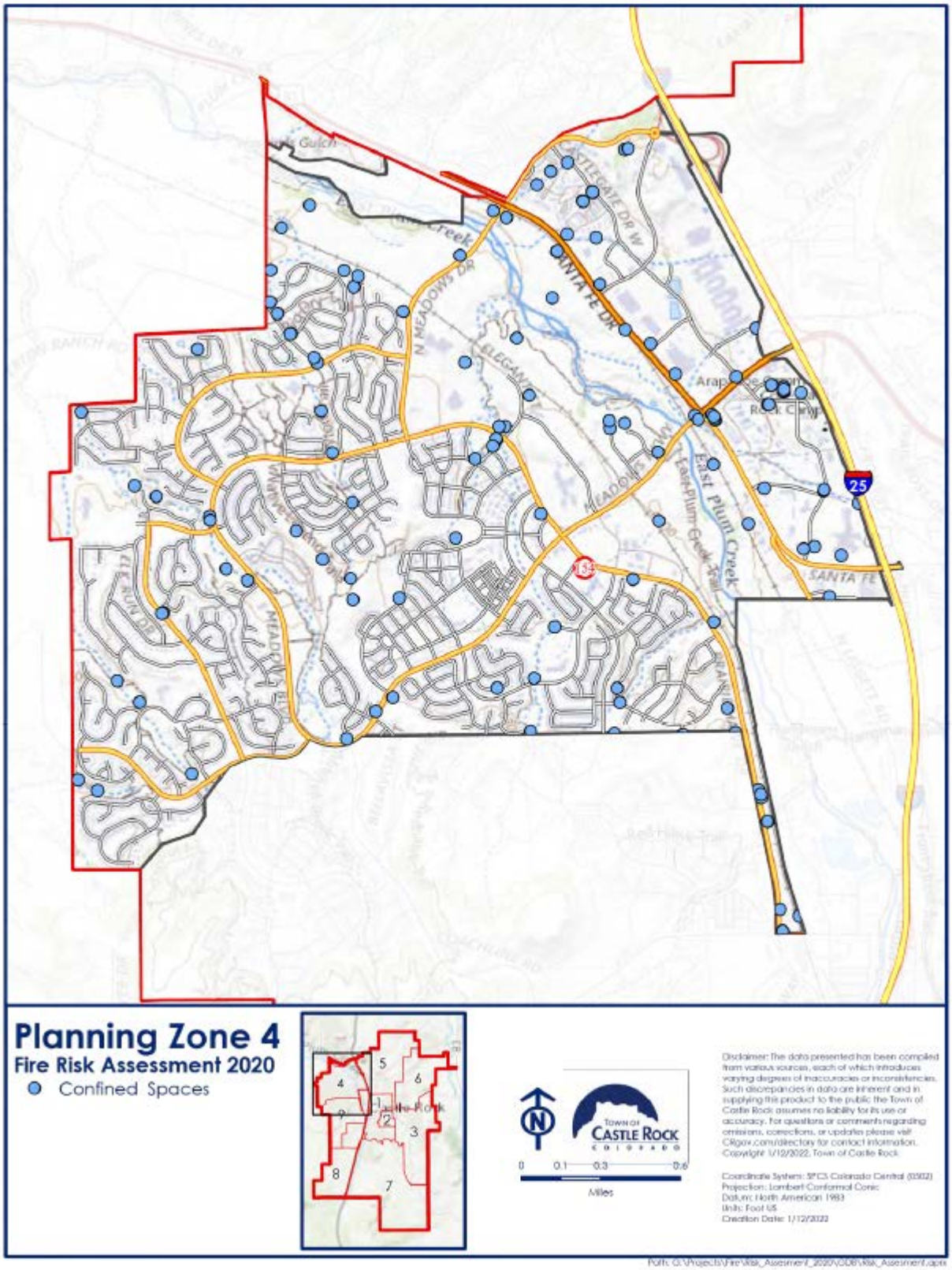
Map 6.3 Confined Space Rescue Risk PZ2 (return to Tech Rescue Risks)



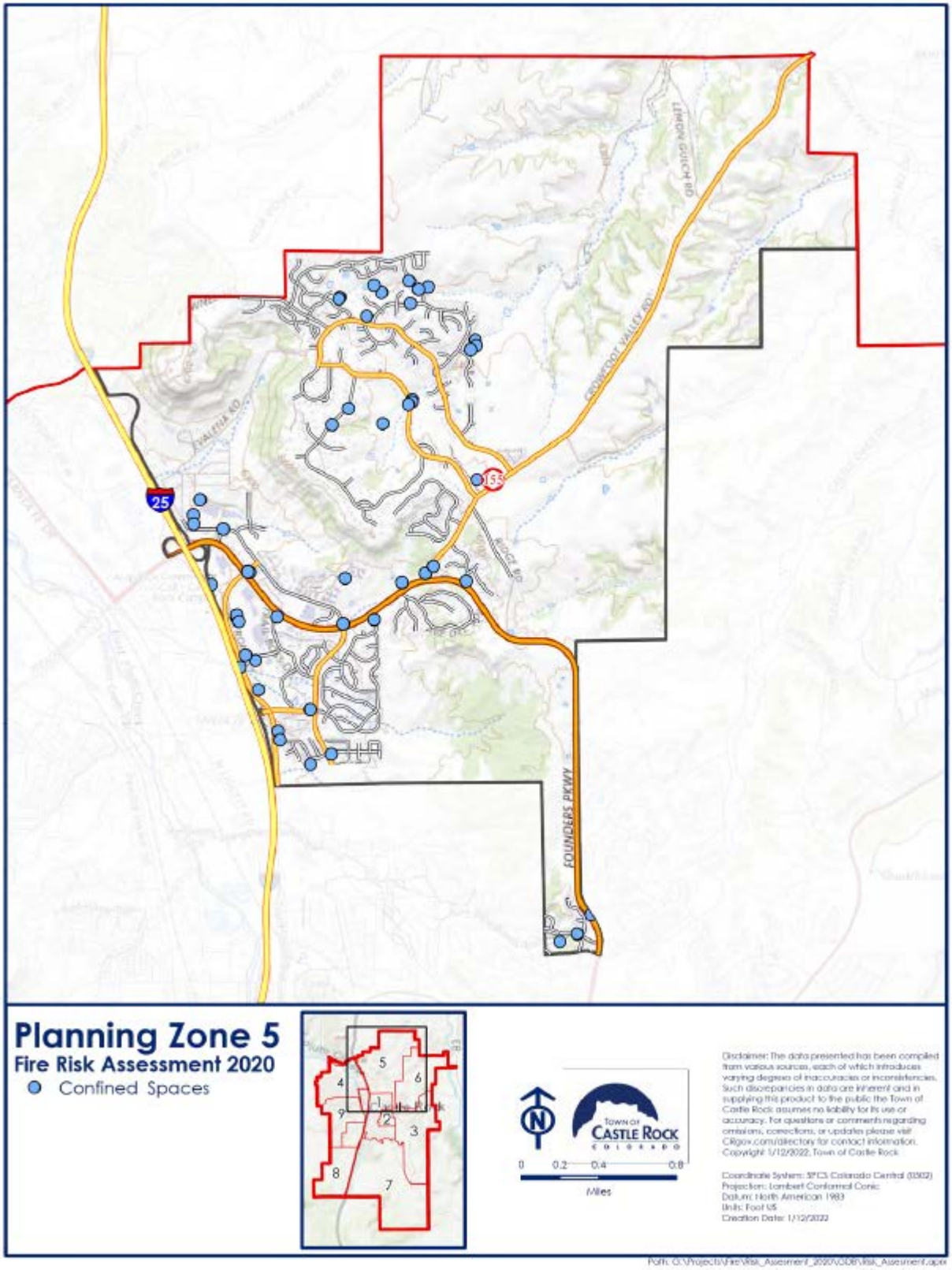
Map 6.4 Confined Space Rescue Risk PZ3 (return to Tech Rescue Risks)



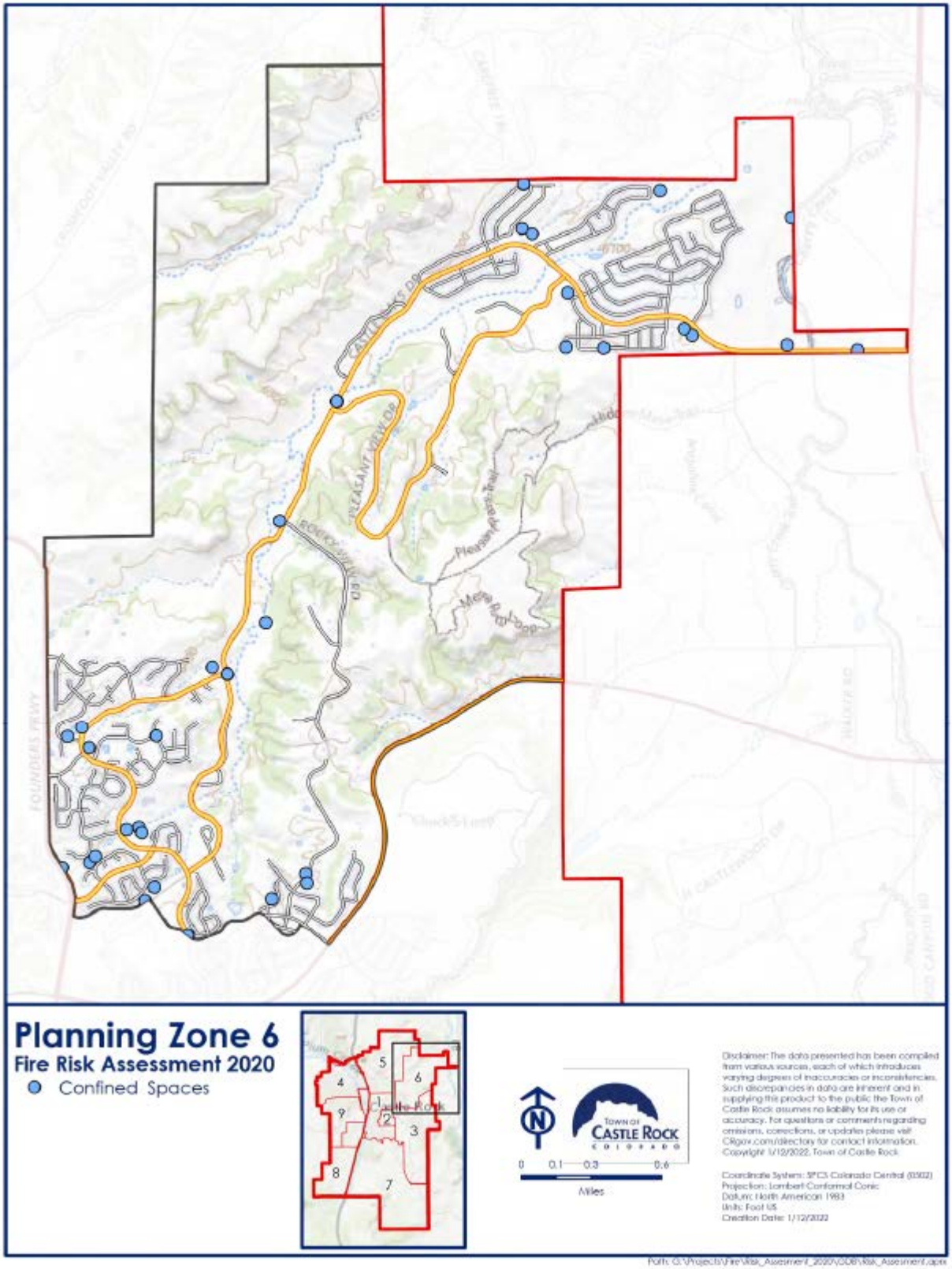
Map 6.5 Confined Space Rescue Risk PZ4 (return to Tech Rescue Risks)



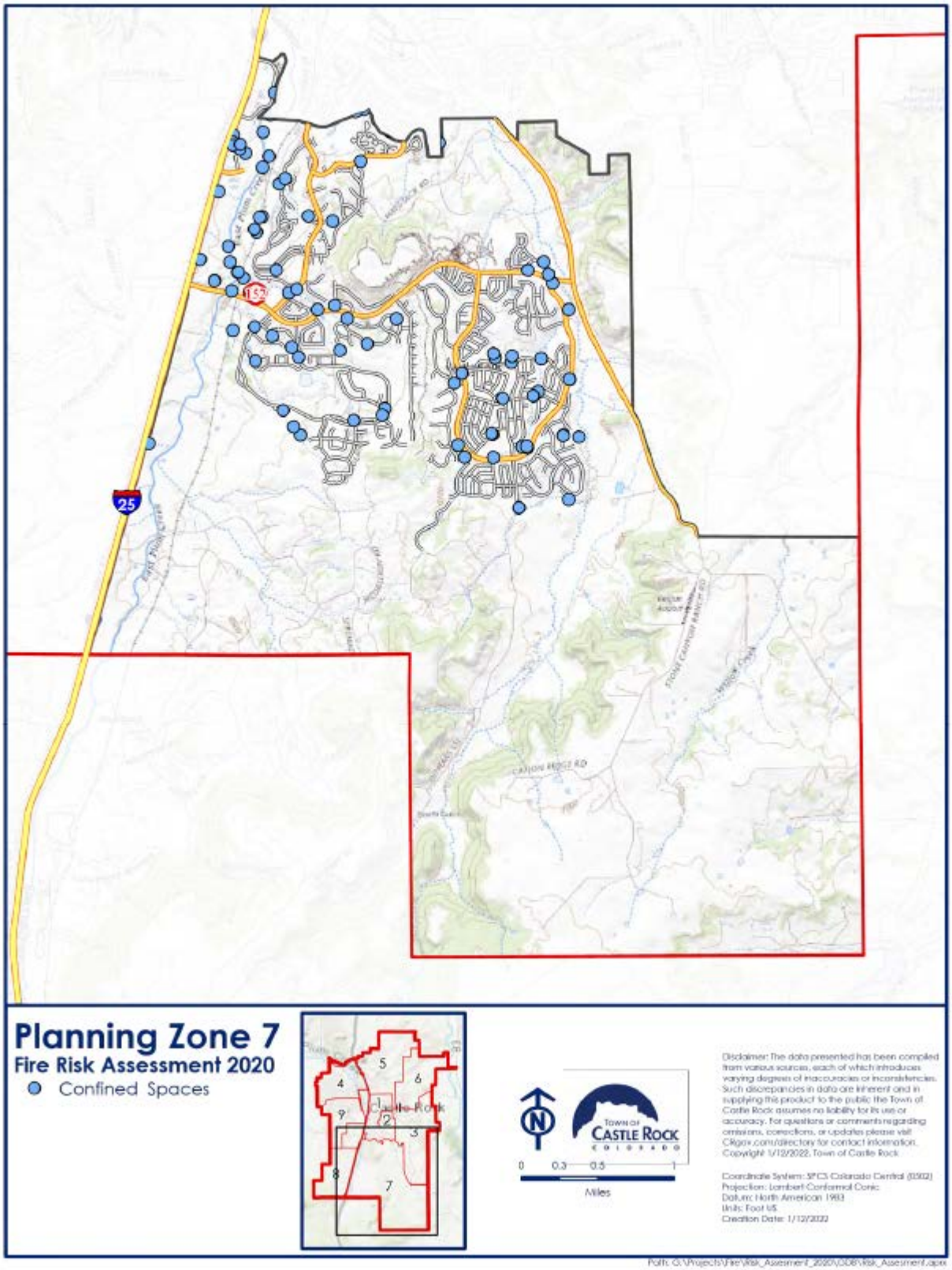
Map 6.6 Confined Space Rescue Risk PZ5 (return to Tech Rescue Risks)



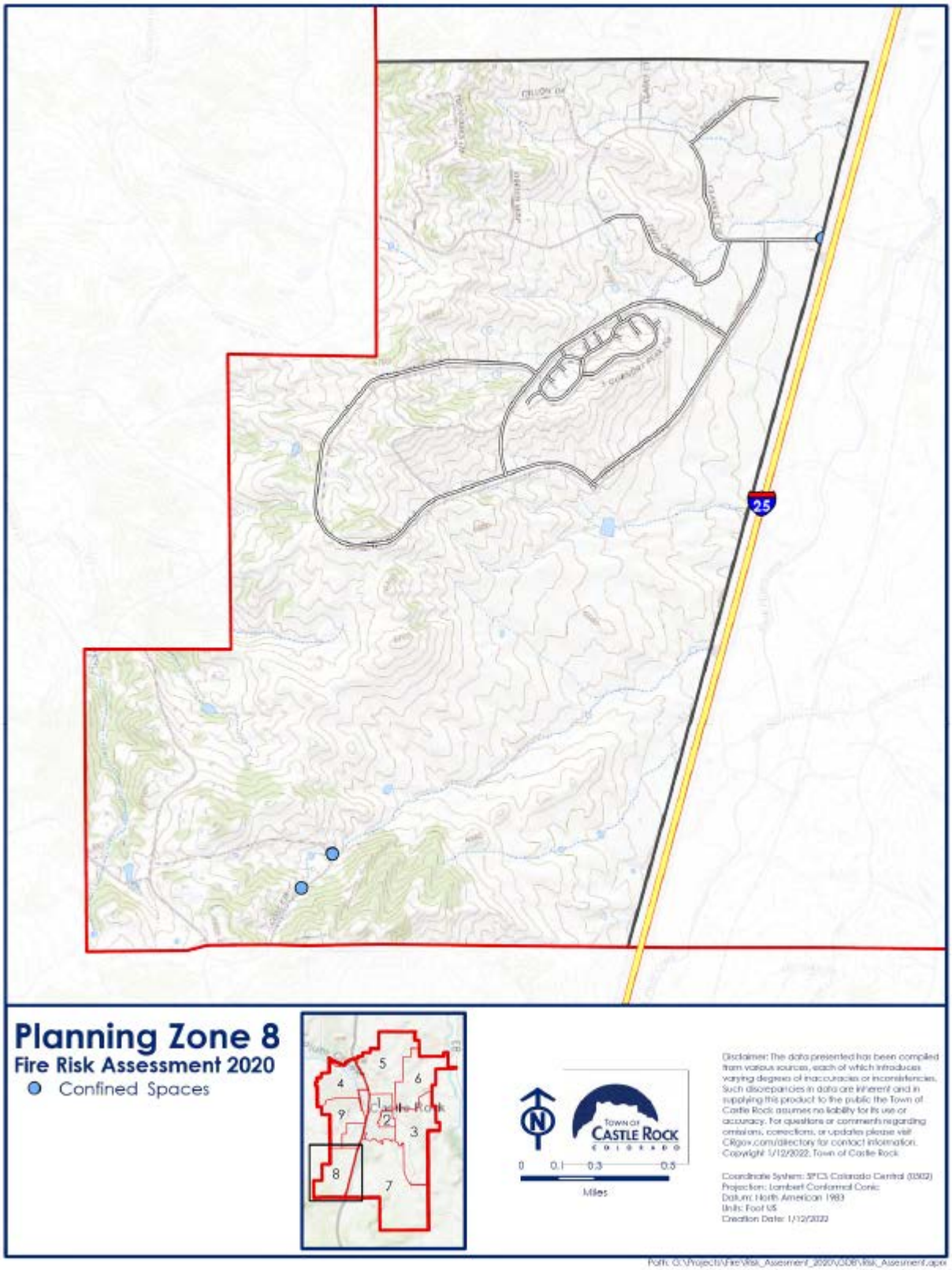
Map 6.7 Confined Space Rescue Risk PZ6 (return to Tech Rescue Risks)



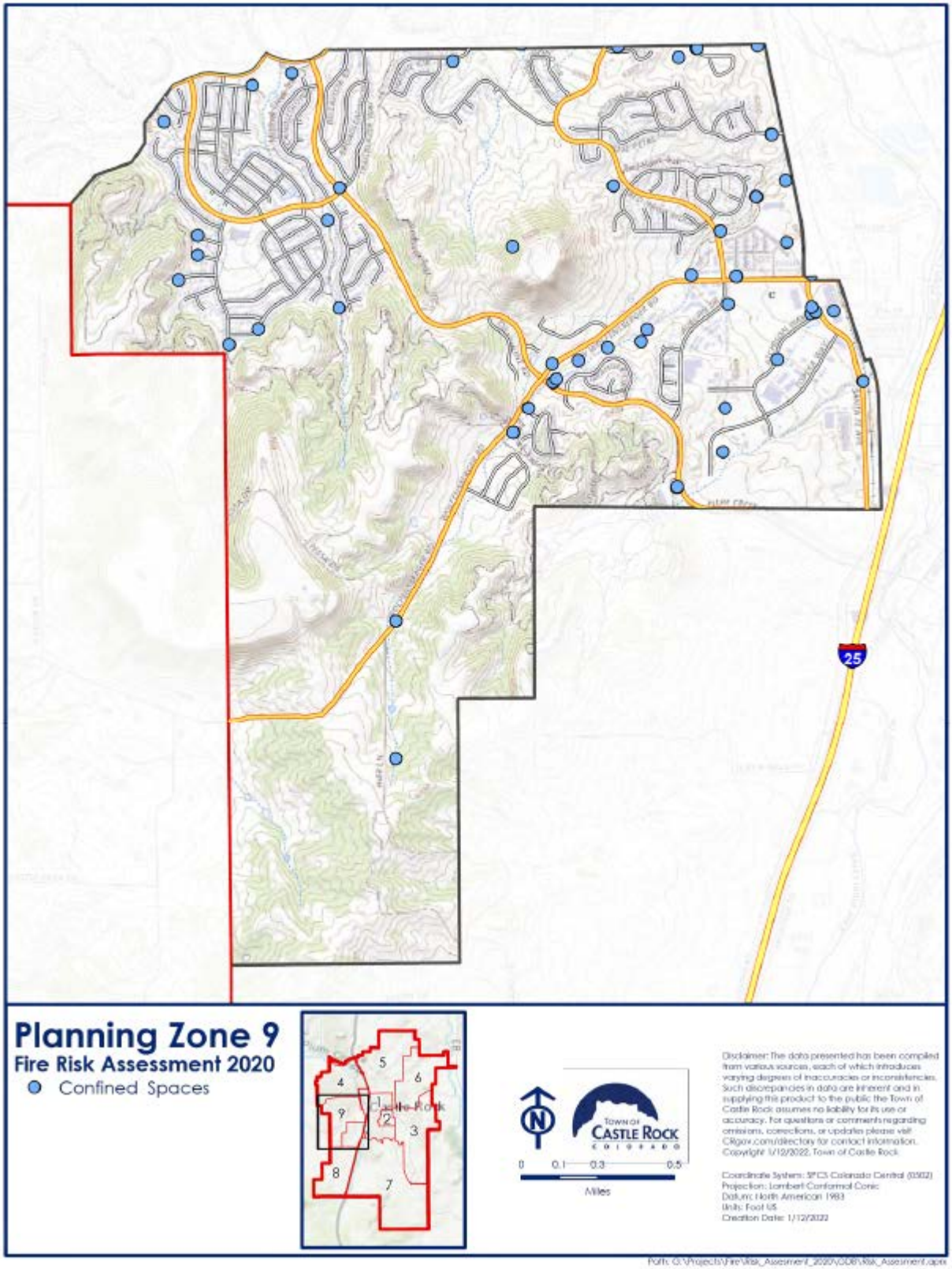
Map 6.8 Confined Space Rescue Risk PZ7 (return to Tech Rescue Risks)



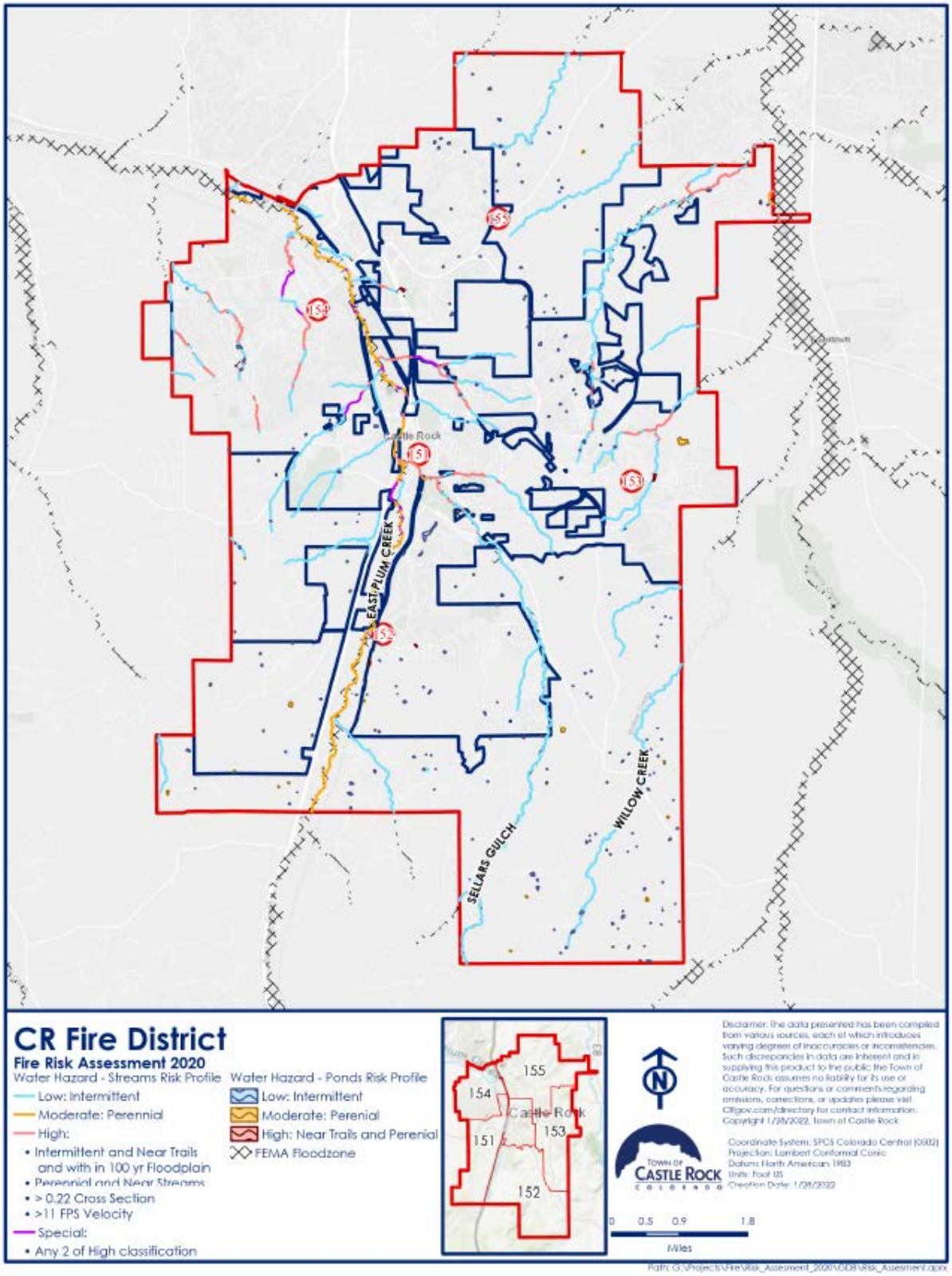
Map 6.9 Confined Space Rescue Risk PZ8 (return to Tech Rescue Risks)



Map 6.10 Confined Space Rescue Risk PZ9 (return to Tech Rescue Risks)

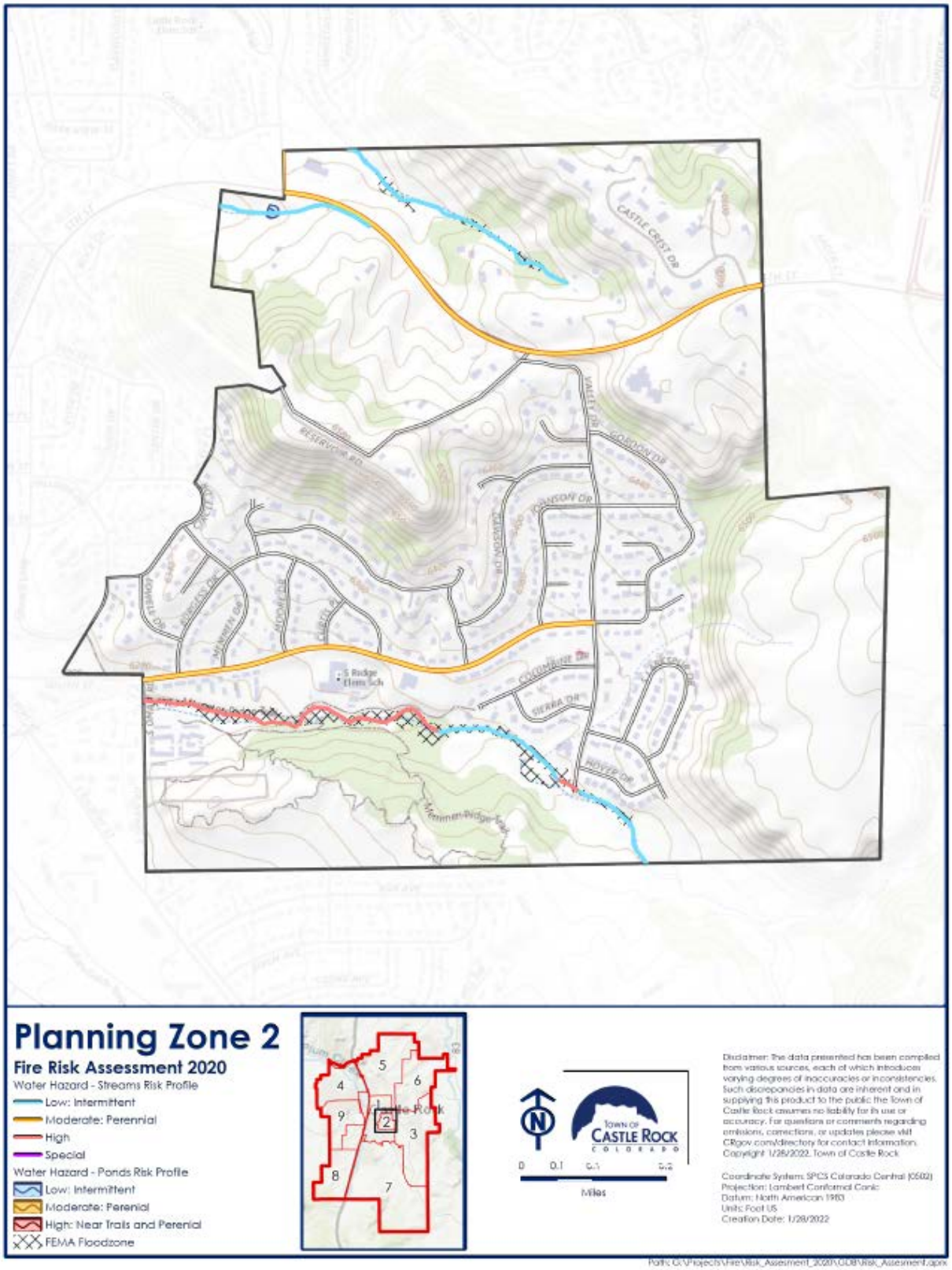


Map 6.11 Water/Ice Rescue Risk CRFD (return to Tech Rescue Risks)

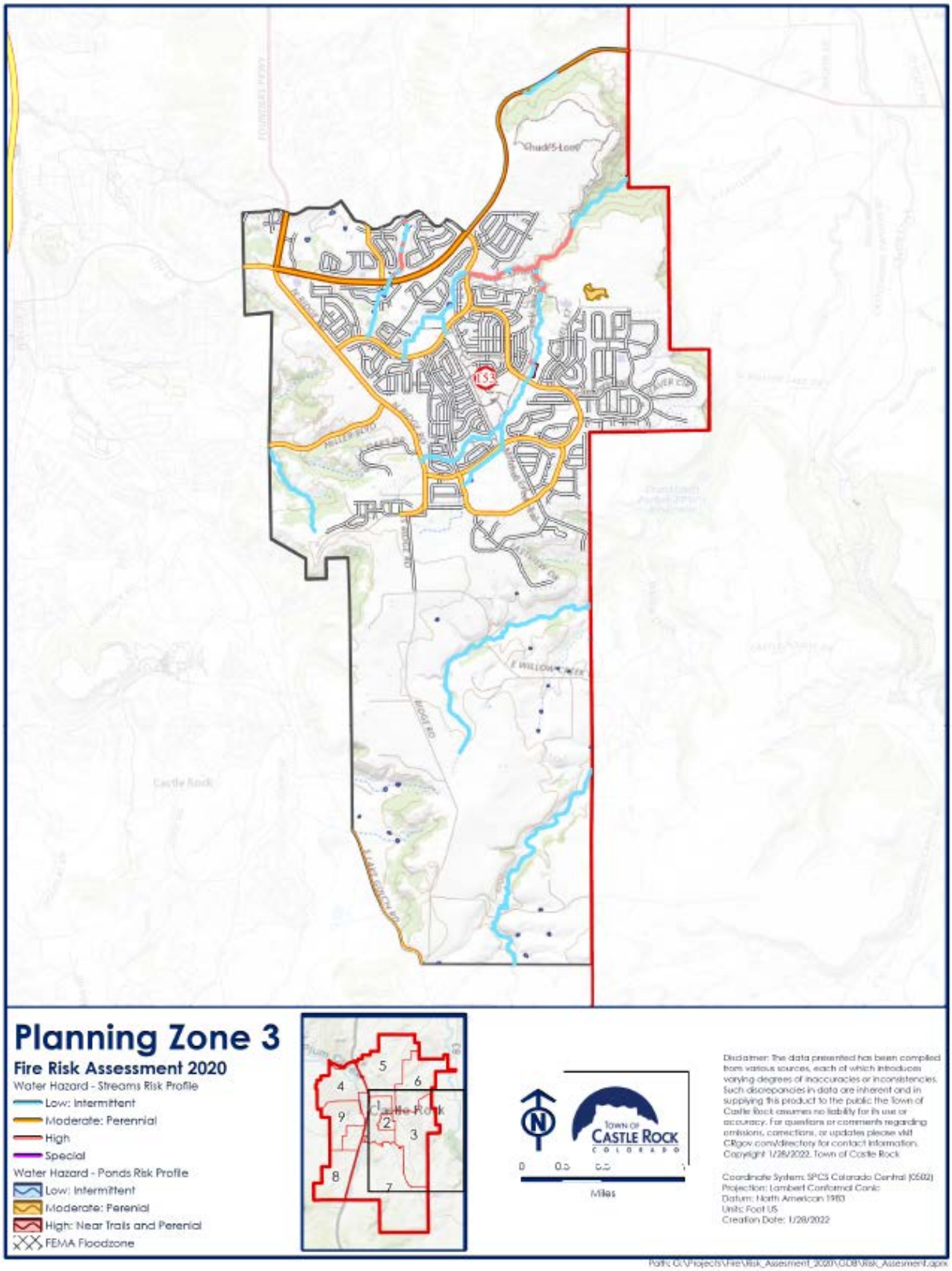


Map 6.12 Water/Ice Rescue Risk PZ1 (return to Tech Rescue Risks)

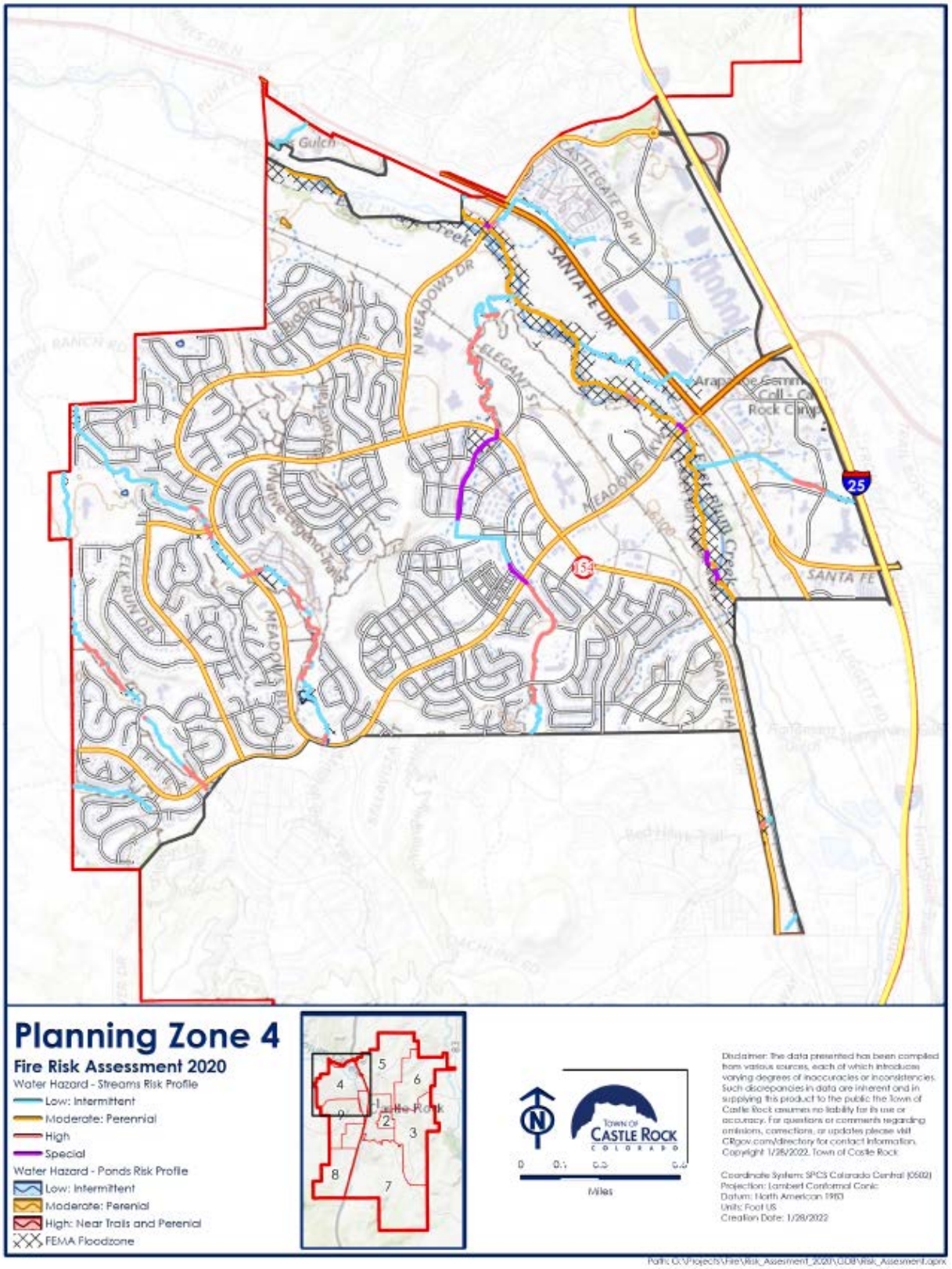
Map 6.13 Water/Ice Rescue Risk PZ2 (return to Tech Rescue Risks)



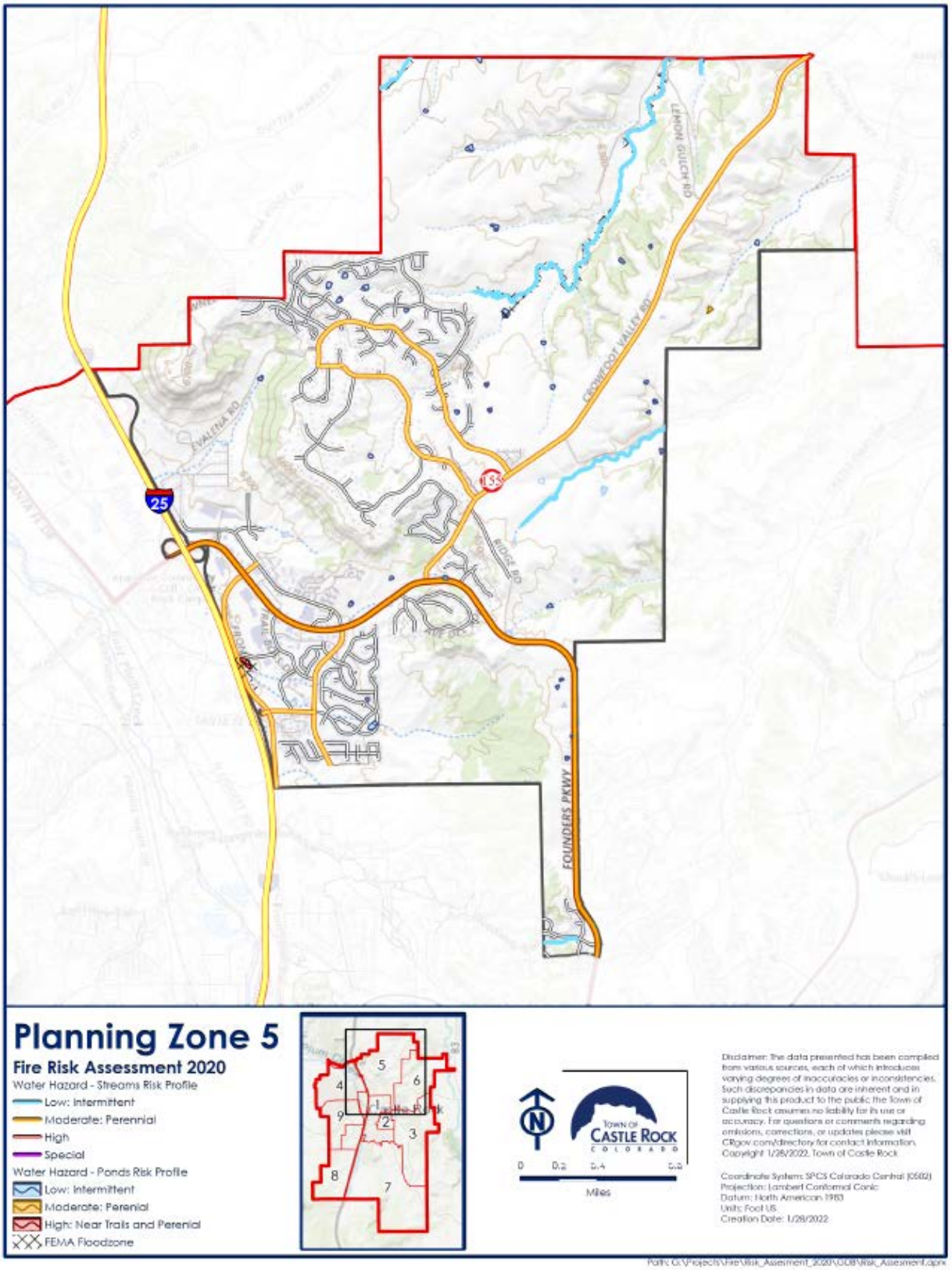
Map 6.14 Water/Ice Rescue Risk PZ3 (return to Tech Rescue Risks)



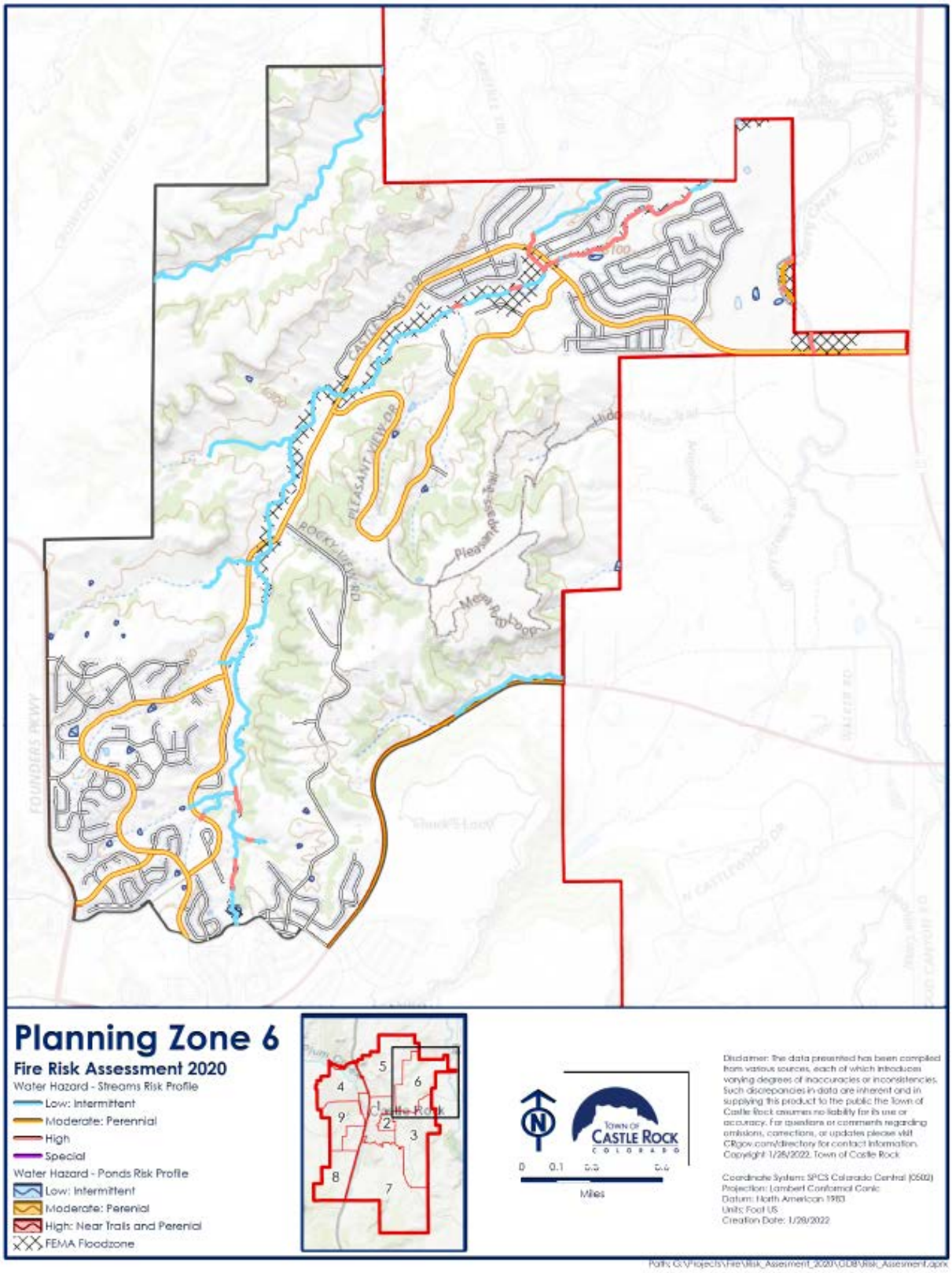
Map 6.15 Water/Ice Rescue Risk PZ4 (return to Tech Rescue Risks)



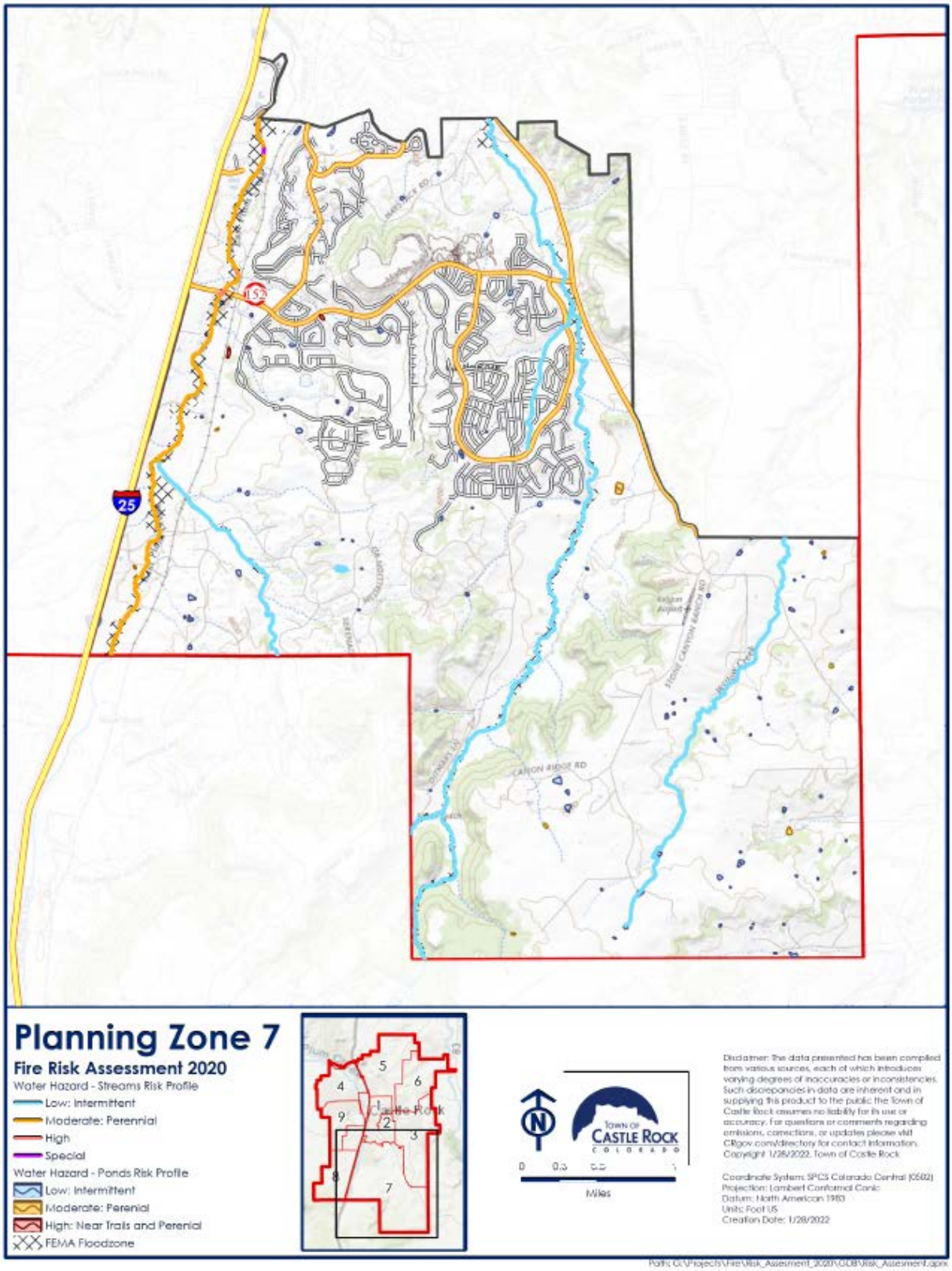
Map 6.16 Water/Ice Rescue Risk PZ5 (return to Tech Rescue Risks)



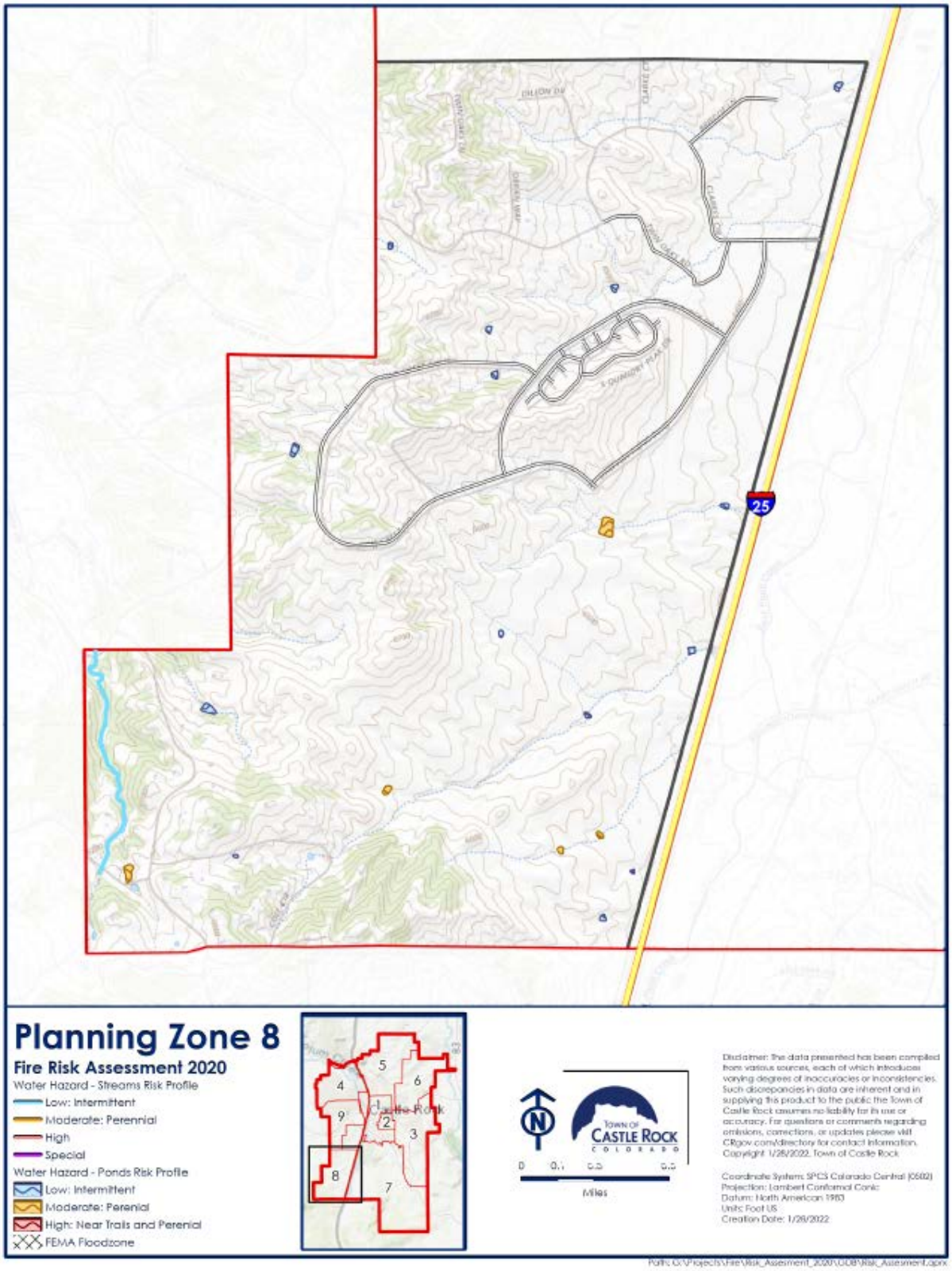
Map 6.17 Water/Ice Rescue Risk PZ6 (return to Tech Rescue Risks)



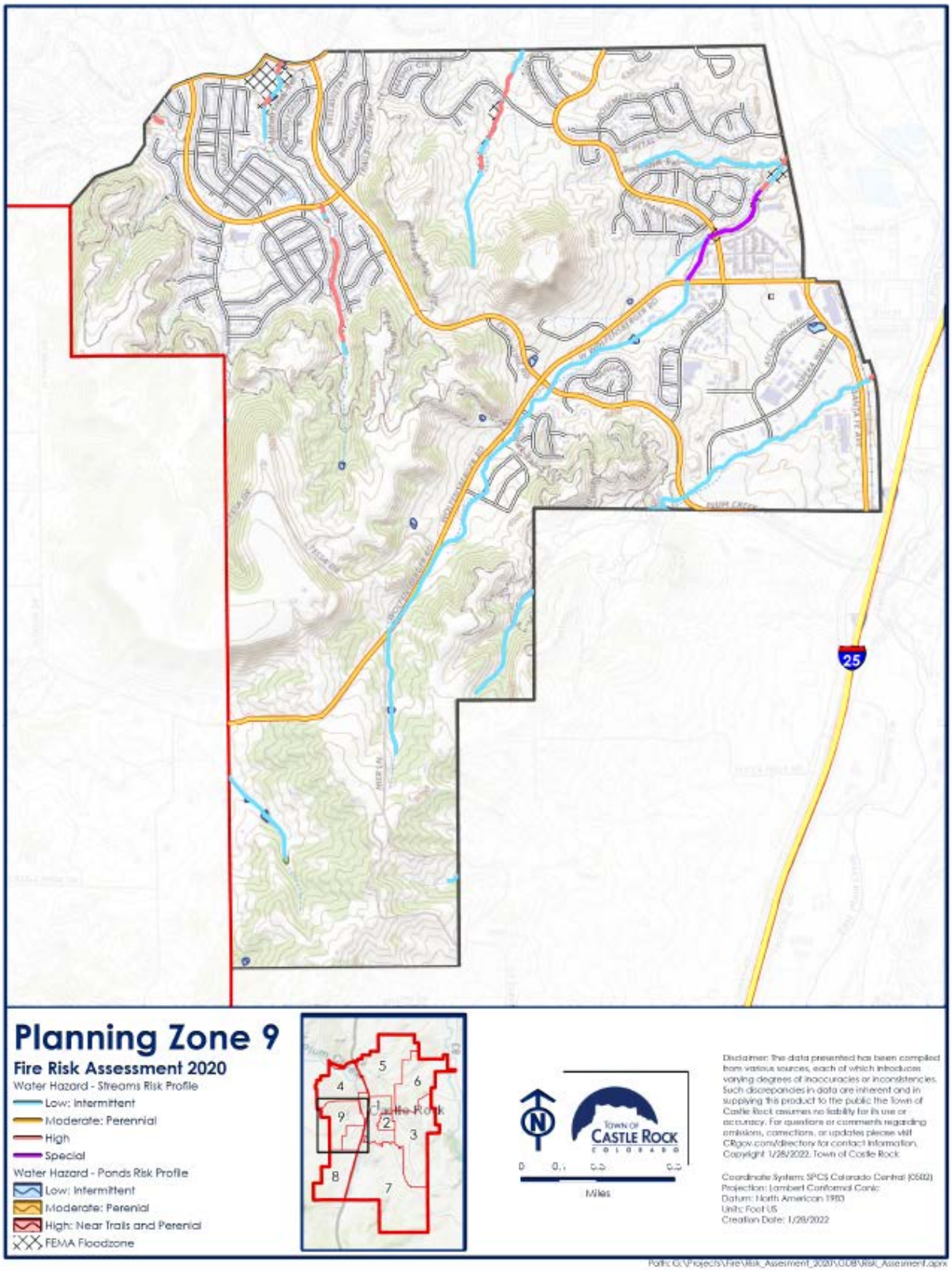
Map 6.18 Water/Ice Rescue Risk PZ7 (return to Tech Rescue Risks)



Map 6.19 Water/Ice Rescue Risk PZ8 (return to Tech Rescue Risks)

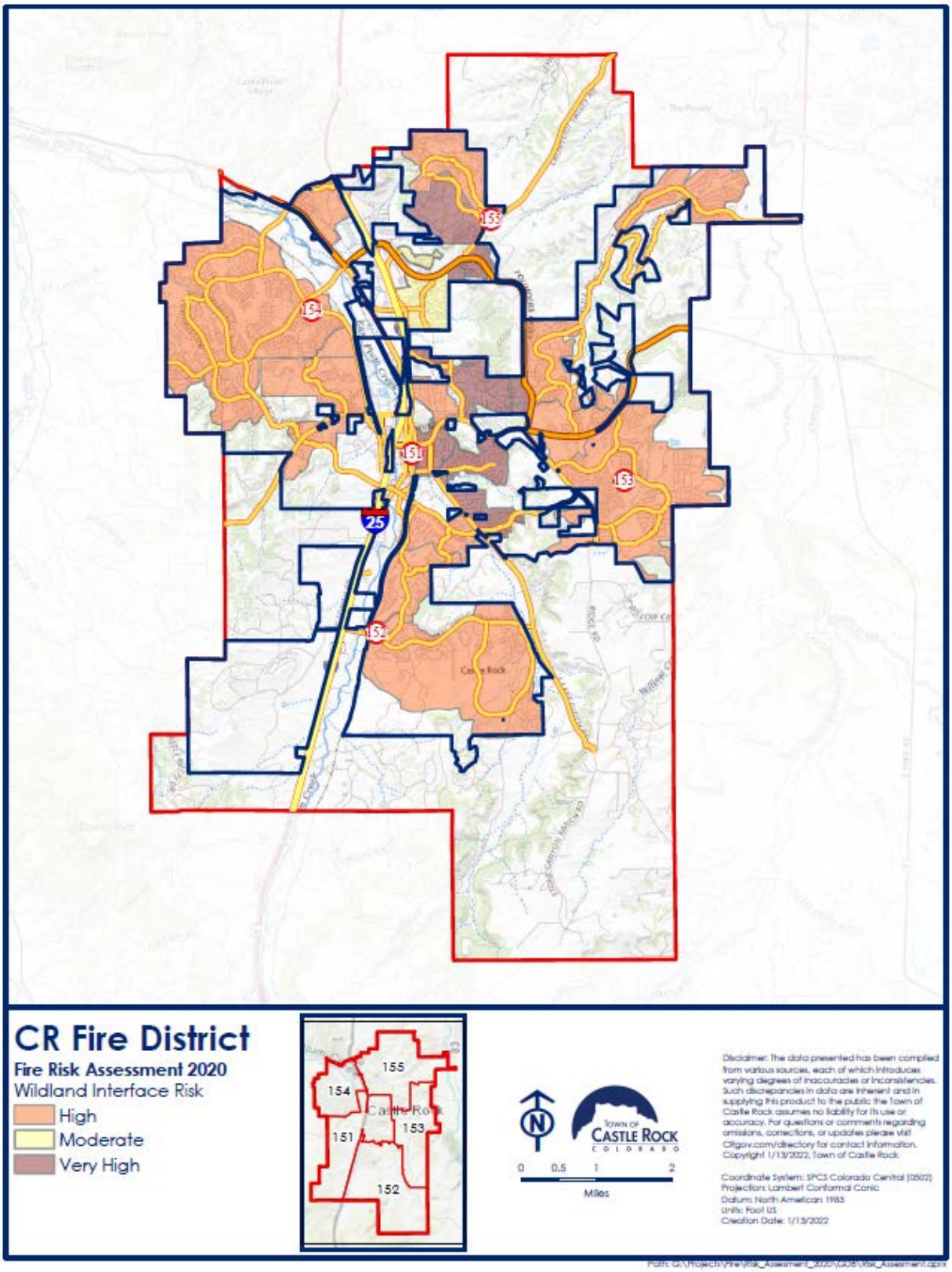


Map 6.20 Water/Ice Rescue Risk PZ9 (return to Tech Rescue Risks)

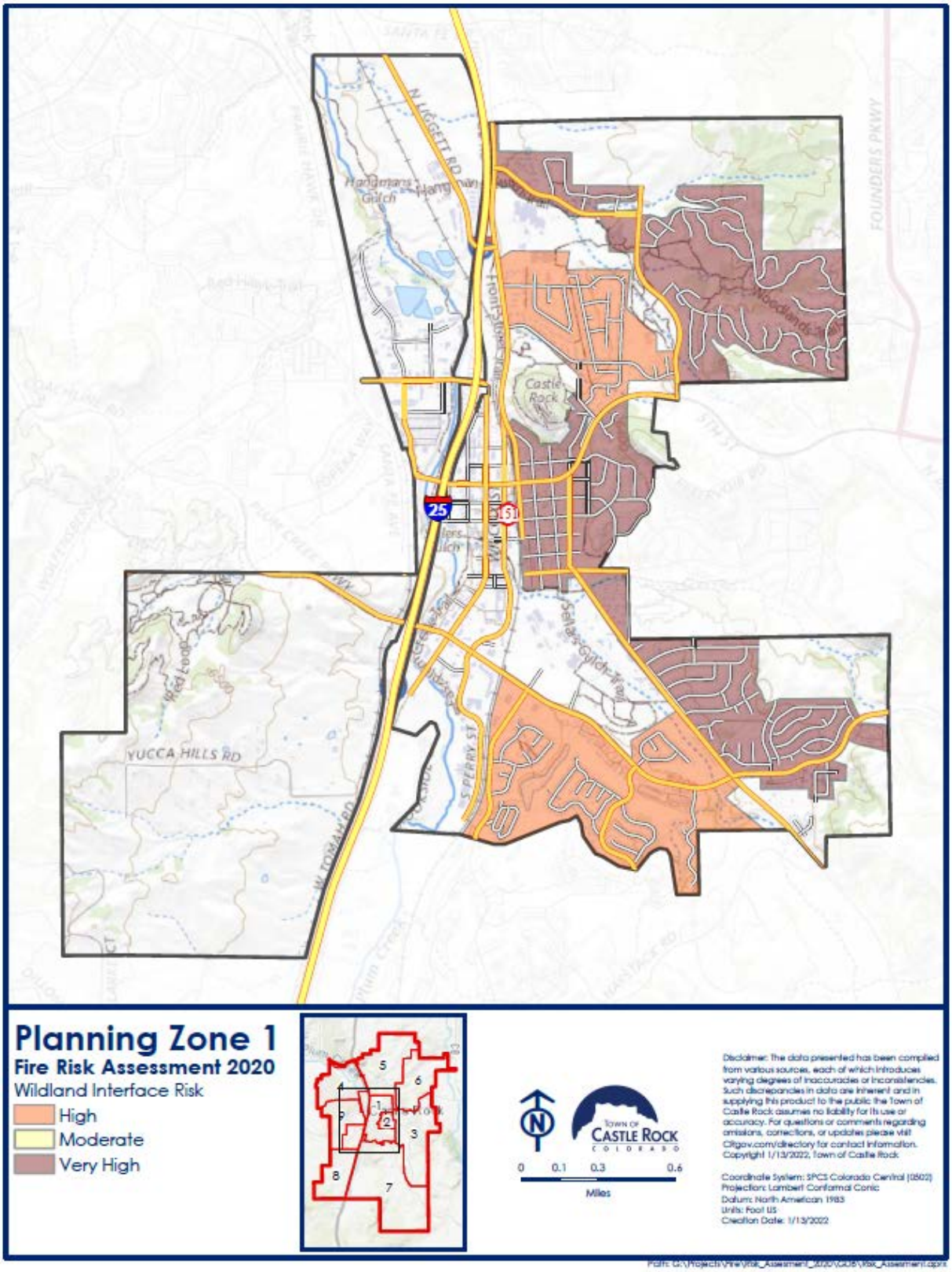


Appendix E Wildland Risk Assessment Maps

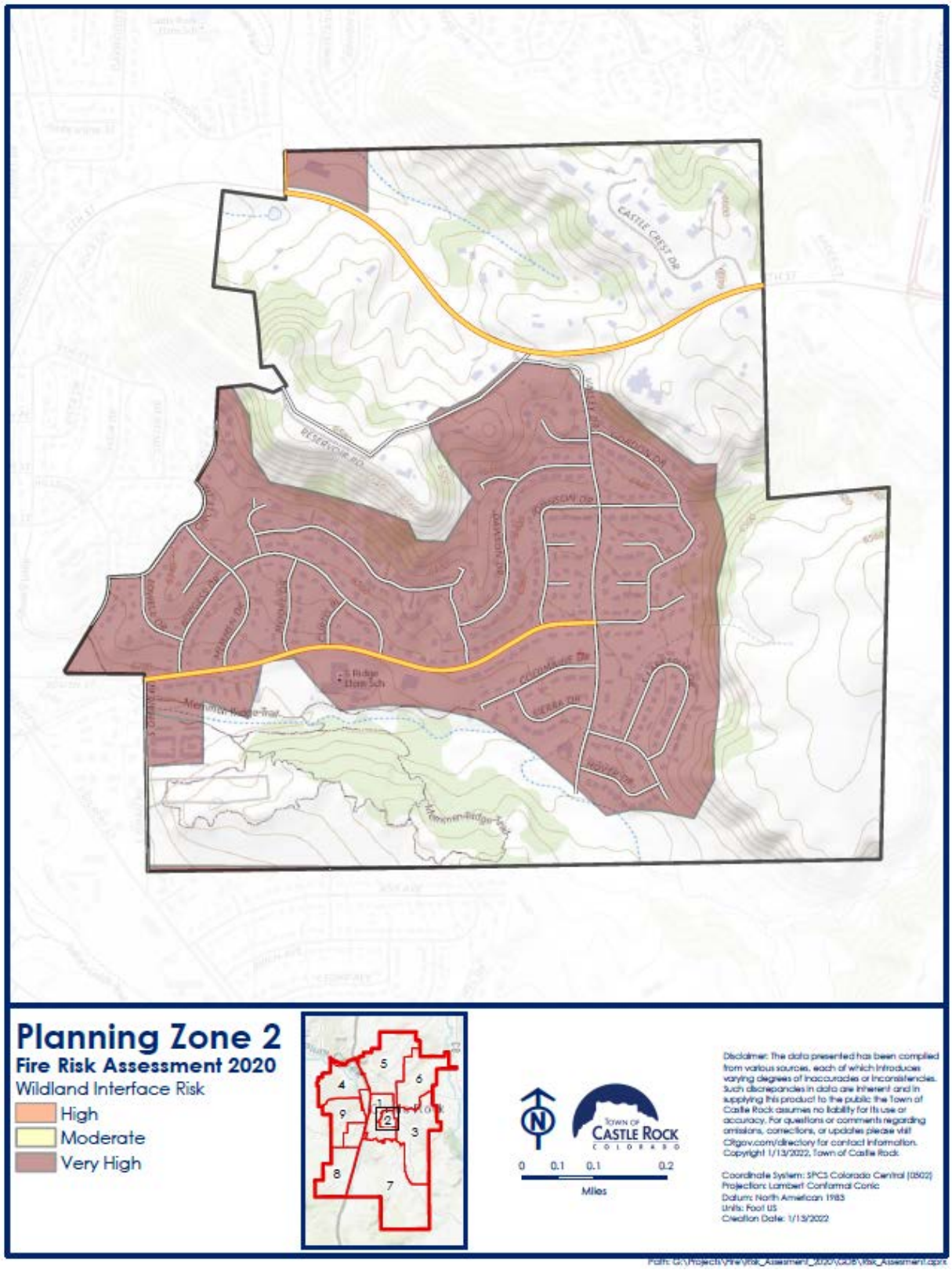
Map 7.1 Wildland Fire Risk CRFD (return to Wildland Risks)



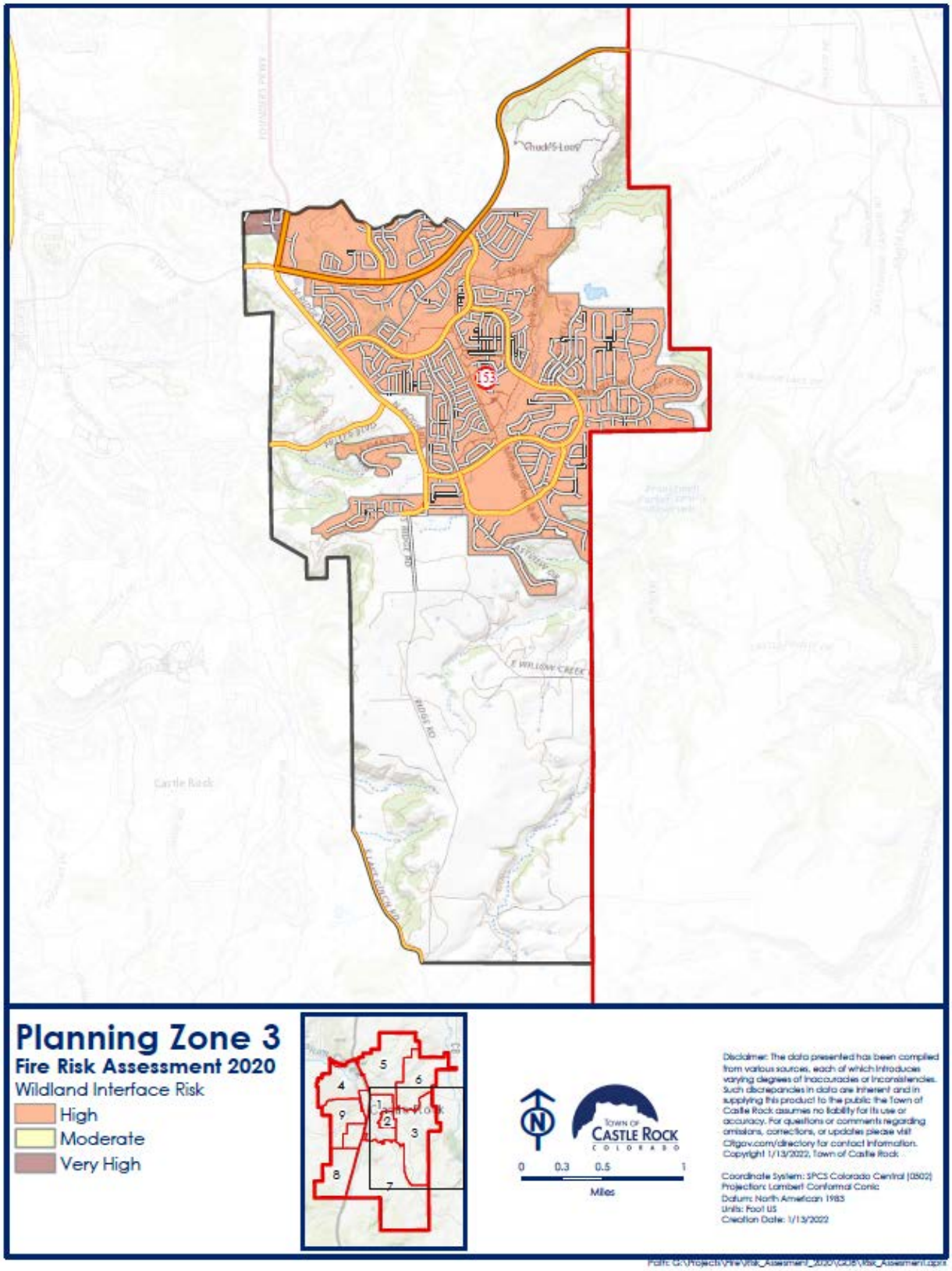
Map 7.2 Wildland Fire Risk PZ1 (return to Wildland Risks)



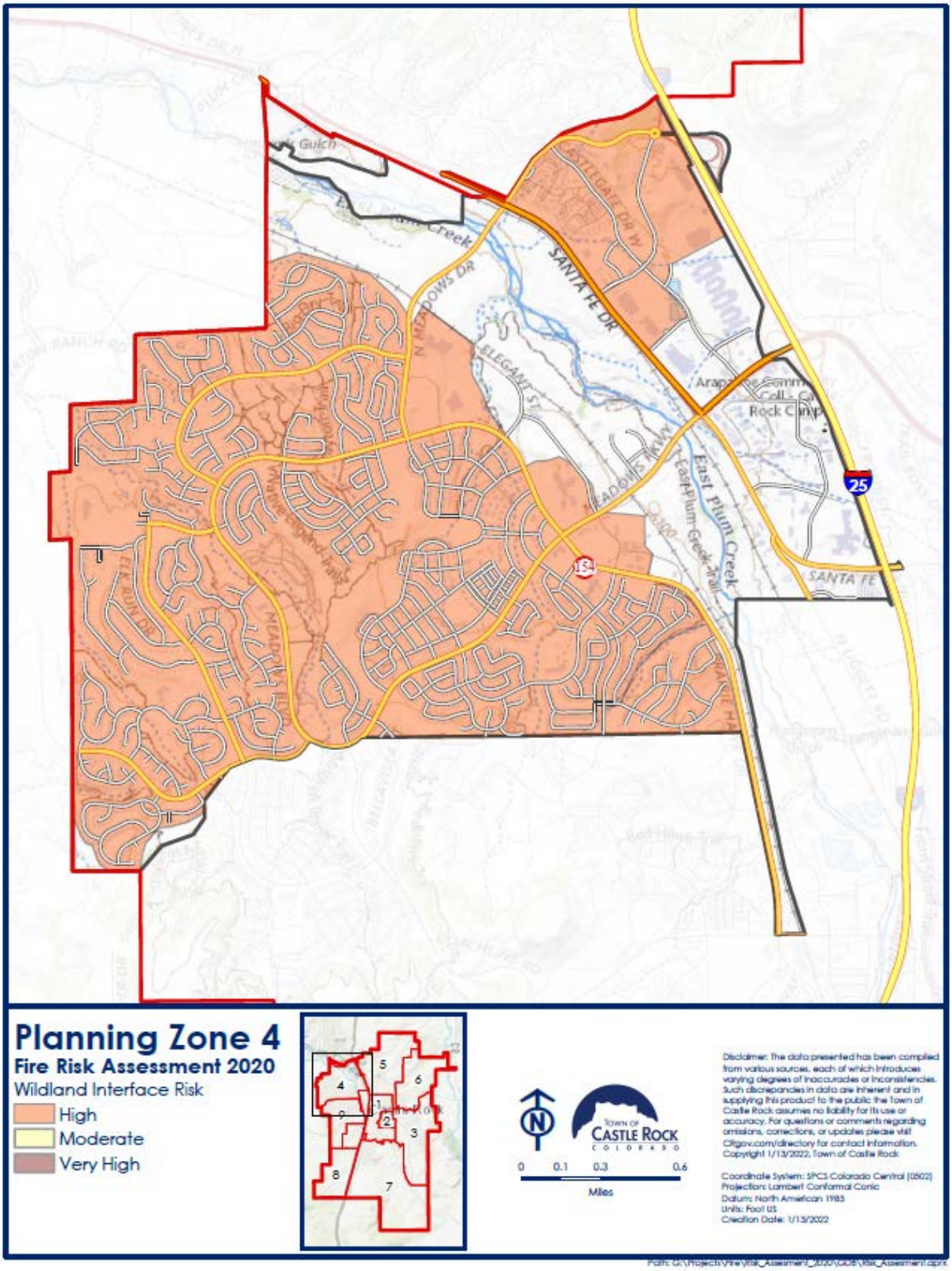
Map 7.3 Wildland Fire Risk PZ2 (return to Wildland Risks)



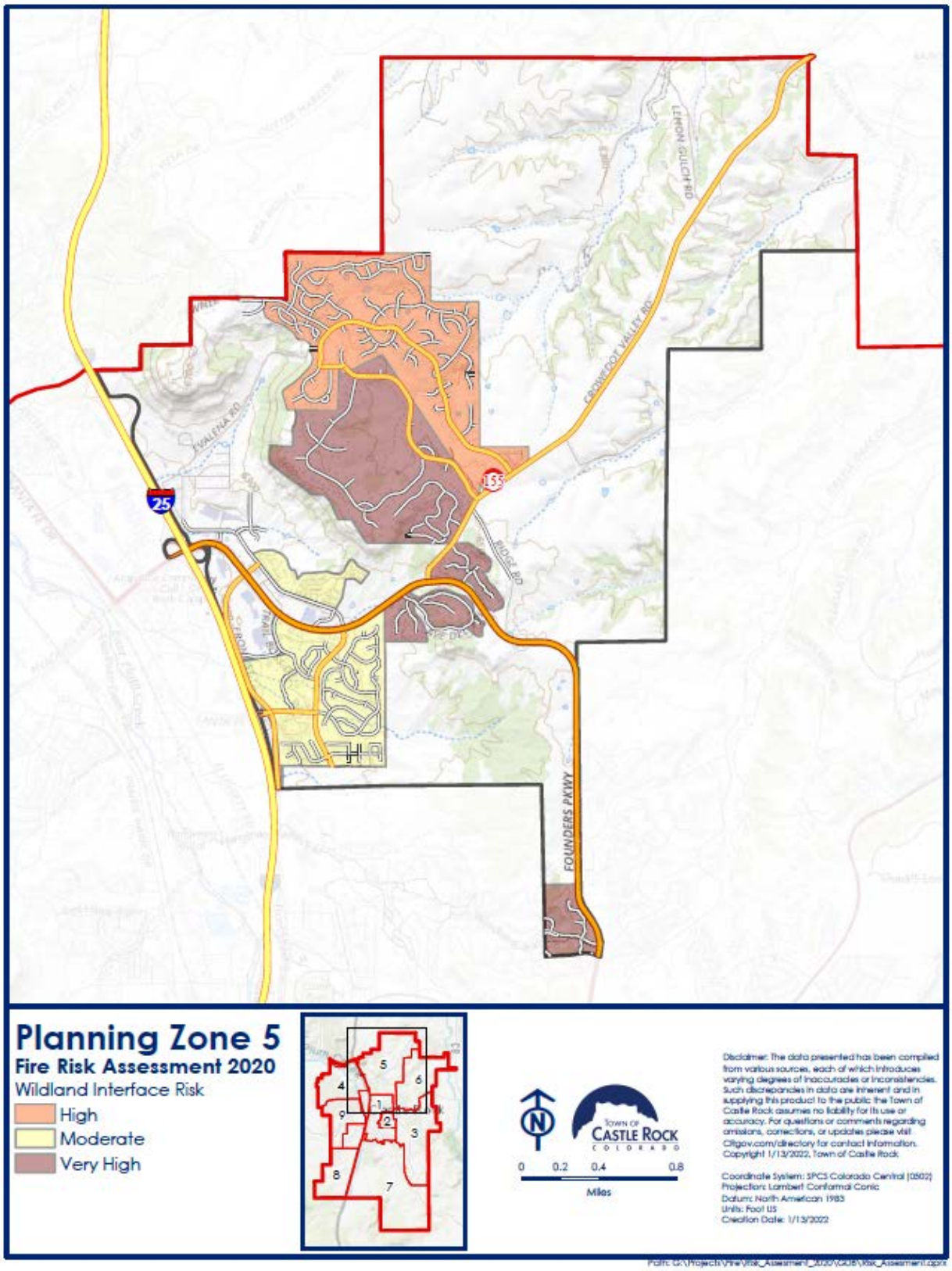
Map 7.4 Wildland Fire Risk PZ3 (return to Wildland Risks)



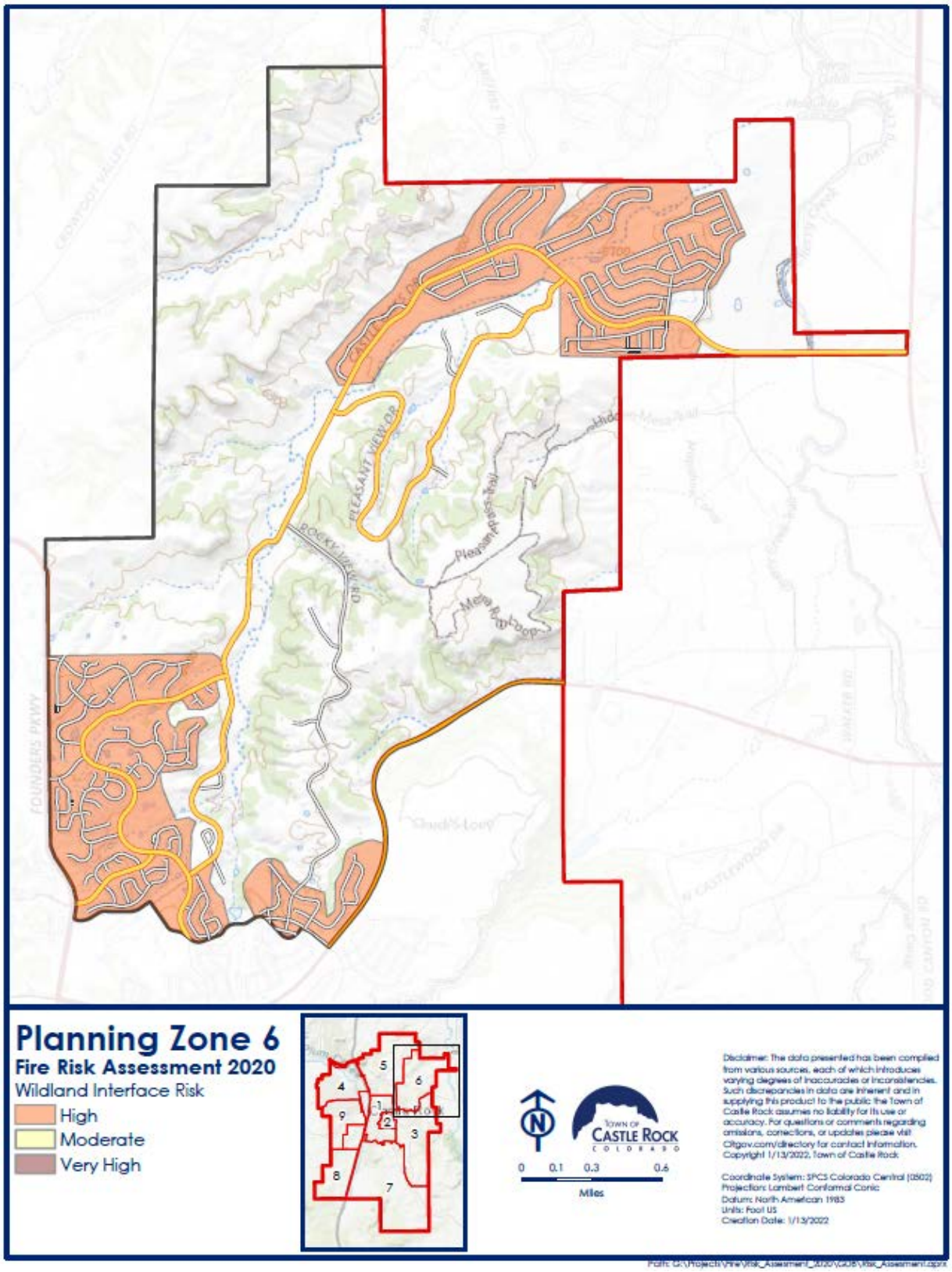
Map 7.5 Wildland Fire Risk PZ4 (return to Wildland Risks)


Planning Zone 4
Fire Risk Assessment 2020
Wildland Interface Risk
High
Moderate
Very High
SANTA FE DR
East Plum Creek
East Plum Creek Trail
Rock Canyon
SANTA FE
25
Town of CASTLE ROCK COLORADO
0 0.1 0.3 0.6
Miles
Disclaimer: The data presented has been compiled from various sources, each of which introduces varying degrees of inaccuracies or inconsistencies. Such discrepancies in data are inherent and in supplying this product to the public the Town of Castle Rock assumes no liability for its use or accuracy. For questions or comments regarding omissions, corrections, or updates please visit CRgov.com/directory for contact information.
Copyright 1/13/2022, Town of Castle Rock
Coordinate System: SPCS Colorado Central (0502)
Projection: Lambert Conformal Conic
Datum: North American 1983
Units: Foot US
Creation Date: 1/13/2022

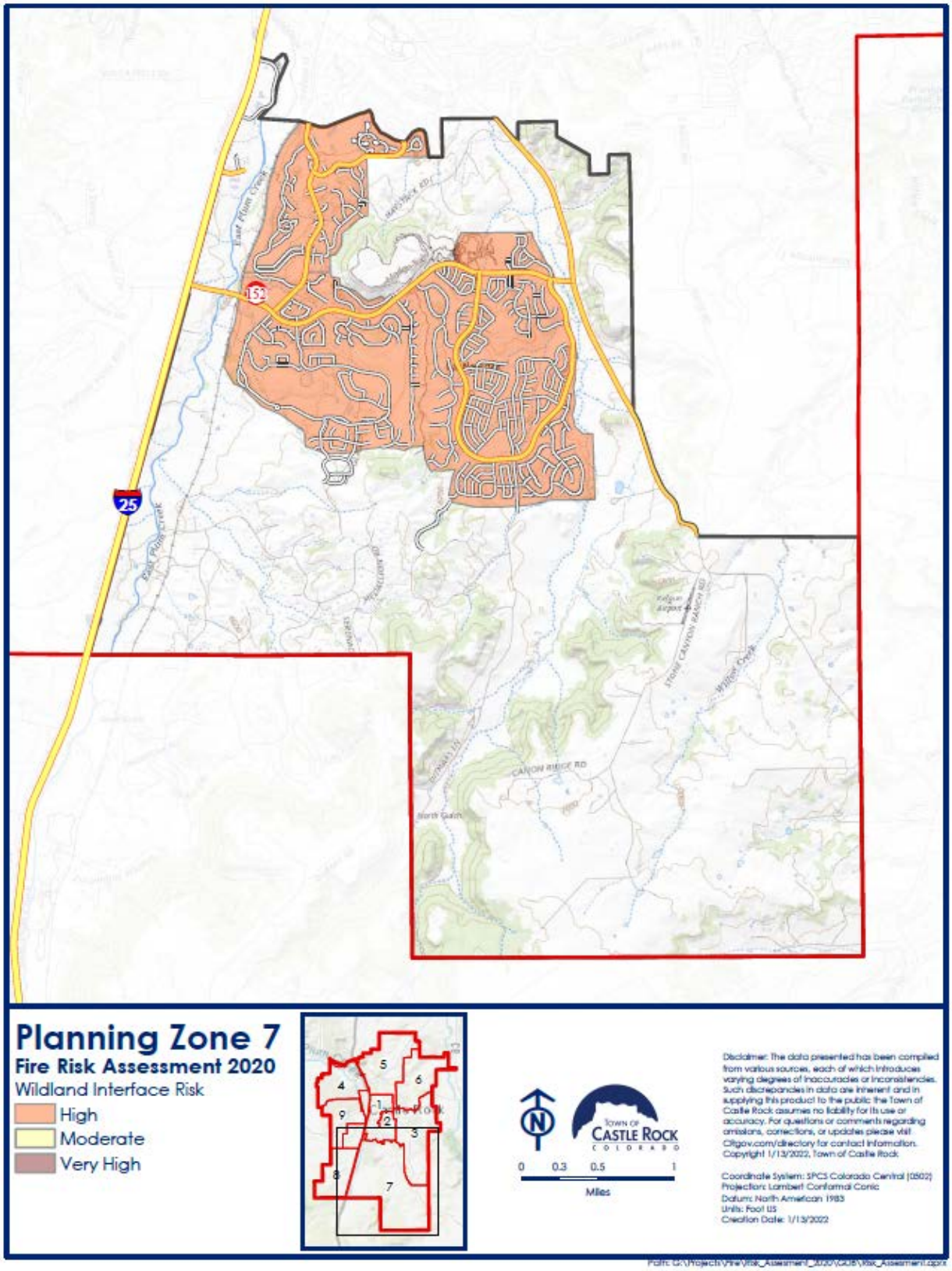
Map 7.6 Wildland Fire Risk PZ5 (return to Wildland Risks)



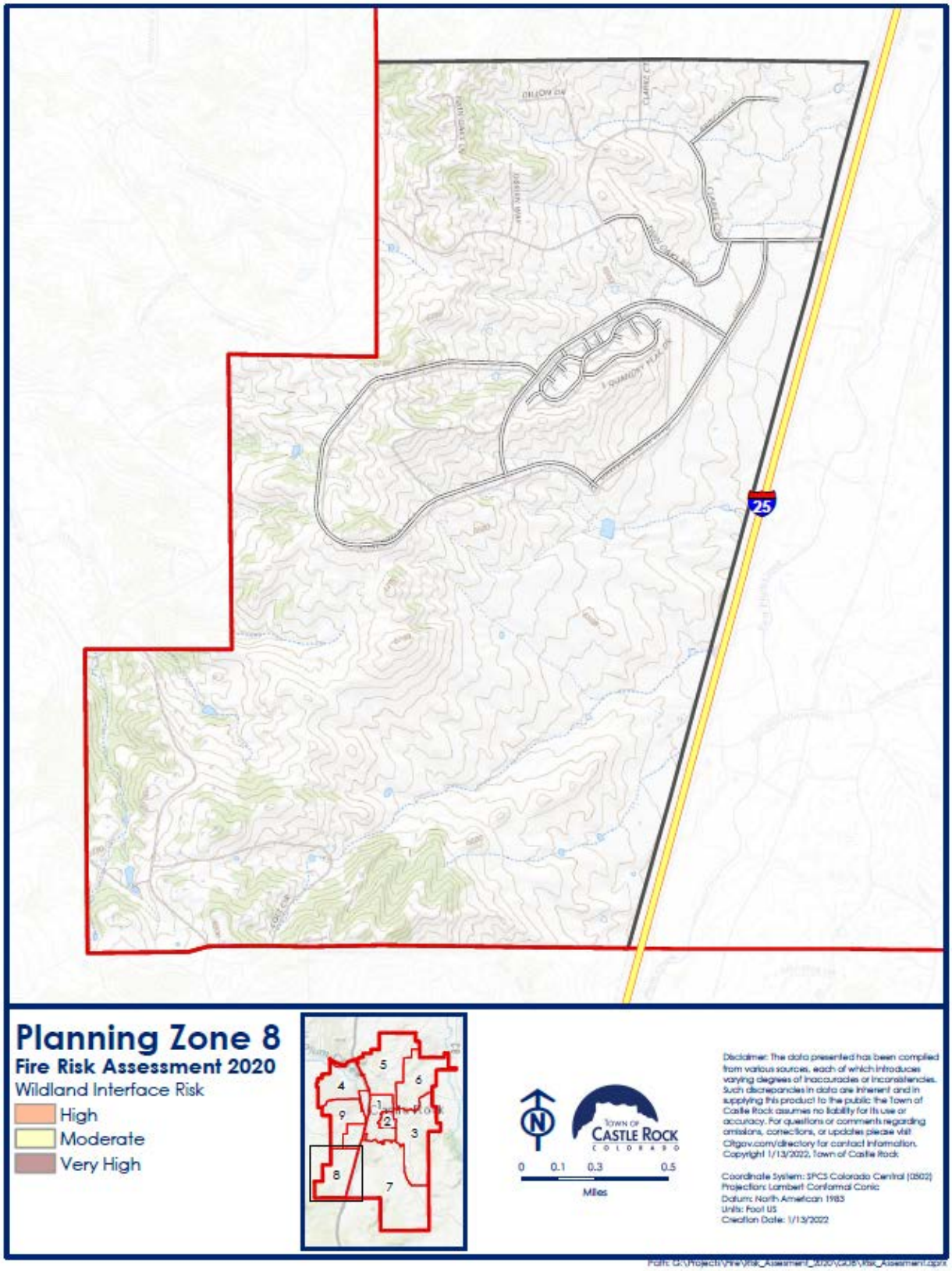
Map 7.7 Wildland Fire Risk PZ6 (return to Wildland Risks)



Map 7.8 Wildland Fire Risk PZ7 (return to Wildland Risks)



Map 7.8 Wildland Fire Risk PZ8 (return to Wildland Risks)



Map 7.10 Wildland Fire Risk PZ9 (return to Wildland Risks)