TOWN OF
HIGH LEVEL

Town of High Level
Wildfire Mitigation Strategy

Palisade Consulting Ltd.

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Town of High Level Wildfire Mitigation Strategy
Palisade Consulting Limited
Development Team

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Acknowledgement

The Staff of Town of High Level provided invaluable information that contributed to the development of the High Level Wildfire Mitigation Strategy. In particular, Palisade would like to express its appreciation for the efforts of Rodney Schmidt Director of Protective Services.

Fire Prevention Officer Samantha Davies and the staff of the Forestry Division provided a high level of support, advice, and data for the project.

The staff at Town of High Level lent their knowledge and expertise to the project to ensure a high degree of information and accuracy.

Executive Summary

The Town of High Level is at risk from wildland fire. It is the responsibility of local government to inform and prepare area residents and involved organizations for the threat of a wildland-urban interface fire. The purpose of this plan is to identify and address the wildland-urban interface fire hazard in High Level and to use this information to establish a process to mitigate the risk and consequences of an interface fire.

A wildfire threat assessment has identified that the community is at highest risk from wildfire during the spring cured grass stage. A wildfire occurring under extreme hazard conditions and strong winds could pose a serious threat to the Town.

Within the Planning Area, detailed wildland-urban interface hazard assessments were conducted on developments and vegetation types to quantify the wildland-urban interface hazard and to help set priorities for mitigation. The Planning Area was divided into five individual units based on wildland fuel types and natural boundaries. Many of the hazards identified can be reduced through public education.

The goal of vegetation management is to create a "vegetation-free zone" where flammable vegetation surrounding structures and at strategic locations on the community perimeter is reduced or eliminated. Vegetation management consists of any combination of fuel removal, fuel reduction, or species conversion. A detailed wildland-urban interface vegetation management implementation plan is provided for municipal and crown lands. An essential component of a FireSmart community is the maintenance plan that will ensure that fuel modification investment is optimized well into the future.

There are other tools that can be used by local governments to mitigate interface fires. These include development control, legislation and planning, public education, inter-agency cooperation, and emergency planning initiatives. Area Structure plans can identify wildland fire hazard and risk, and development permits can control the design of buildings and landscaping on properties in new development areas. Community Standards and development bylaws can be used to control properties in areas at risk to interface fires. High Level can use public education to encourage residents to modify their properties to minimize the risk of interface fires. risk

High Level Fire Department and their partners are responsible for fire prevention and suppression within the Town, and special training and equipment are necessary for fire suppression in interface areas. Emergency response planning, interagency cooperation and mutual aid agreements are critical in preparation for interface fires within and adjacent to the Town.

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1 INTRODUCTION

The Town of High Level is known as the "Gateway to the South". Situated approximately 800 km north of Edmonton at the junction of Highways 58 and 35, the Town is home to 3,293 residents. The businesses serve a trading area of approximately 28,000 people and extends into the Northwest Territories. By supporting agriculture, forestry and the oil and gas industry, residents enjoy a high standard of living in an urban environment. The urban fringe area around the Town is within the jurisdiction of Mackenzie County and the Bushe River Indian Reserve.

High Level is an integral part of the forest industry as West Fraser and Tolko Industries are located in the vicinity. The Town is the hub to a wide range of oil and gas and agriculture industries. The Town owns and operates the High Level Airport. The Wildfire Management Branch operates the High Level Fire Center at the Airport. The Town is bisected by the Canadian National Railway.

The Town is situated in the vicinity of flammable forest fuels and pre-planning for a wildfire event is essential. Council and Administration have been actively working for years to reduce the potential risk of wildfire to the community. Various firefighter training, vegetation management and public awareness initiatives have all helped to increase overall preparedness for a large fire event. In 2016, a Wildfire Mitigation Strategy was prepared to document the work completed and to provide recommendations to further minimize that risk through the use of vegetation management, development control, legislation, public education, interagency cooperation, and emergency planning initiatives. The plan was developed with the cooperation of representatives from the Town of High Level and Alberta Agriculture, Forestry and Rural Development.

The Chuckegg Creek Fire, Wildfire HWF-042-2019, started during the afternoon of May 12th, 2019 south of the Town of High Level. The fire resulted in a declaration of a State of Local Emergency and the evacuation of the Town. The fire was extinguished in the winter at 350,000 ha in size. The fire has had a dramatic impact on the forest environment, which has evolved to grass fuel.

The 2016 Strategy was updated in 2019. The Wildfire Sprinkler Plan and Wildfire Preparedness Guide were also updated. A Maintenance Plan was developed for the fireguard on the perimeter of High Level. This strategy includes lands which are being considered for annexation from Mackenzie County. The annexation will provide a land bridge up to and including the Airport. It will also bring the Waste Water Treatment Plant into the Town.

The development of a Wildfire Mitigation Strategy is a proactive approach by Town to create a FireSmart community that is resilient to the impacts of wildfire.

2 GOALS AND OBJECTIVES

The goal of the Town of High Level Wildfire Mitigation Strategy is to provide a guide for the Town to implement FireSmart initiatives within the municipality while retaining and/or enhancing the integrity of the forest environment. The plan will develop strategies to protect the community and infrastructure from wildfire, while considering the social, economic and ecological values of the region.

The following objectives have been developed to provide direction in achieving this goal:

- Identify and quantify wildland-urban interface hazards and risks within and adjacent to developed areas. Conduct a review of the fire regime and a wildfire threat analysis.
- Develop fuel management planning strategies and recommendations to reduce the wildfire threat. Ensure that maintenance plans are developed over the long term to protect the community and the dollars invested into developing fuel management planning strategies.
- Identify present development requirements (structural/infrastructure) and recommend options to improve FireSmart development in the Planning Area.
- Identify existing legislation that helps or hinders the creation of FireSmart developments and recommend new legislative guidelines that will create a higher level of wildfire safety.
- Develop a public education program to inform residents, industry, municipal officials, as well as the media about the Wildfire Mitigation Strategy.
- Identify integrated planning opportunities between the stakeholders.

The Wildfire Mitigation Strategy incorporates the Wildfire Provincial Priority for Resource Allocation and Deployment which has been established by Forestry Division as follows:

- Human life: Town residents, occupied industrial plant sites, construction camps, commercial lodges, campgrounds including private and municipal.
- Communities: Cities, Towns, Villages, Hamlets, subdivisions within Indian Reserves.
- Watershed and Sensitive Soils: Critical fish habitat, areas of possible erosion and siltation, sensitive soils, critical water basins for water production.
- Natural Resources: Terrestrial and aquatic vegetation, wildlife, fisheries, insects and disease, threatened/rare/endangered species, critical age classes, research plots and enhancement treatments, recreation and tourism, protected areas/significant features, visual quality, historical/cultural areas, range opportunities, wood product opportunities, hydrocarbon and in situ resource opportunities.
- Infrastructure: Major roads, major transmission lines, major railways, major telecom sites, major navigational sites, main public travel corridors, buildings.

3 PLANNING AREA

The Planning Area for the Town of High Level Wildfire Mitigation Strategy includes all the developed and undeveloped area within the Town's corporate boundary and the proposed annex areas.

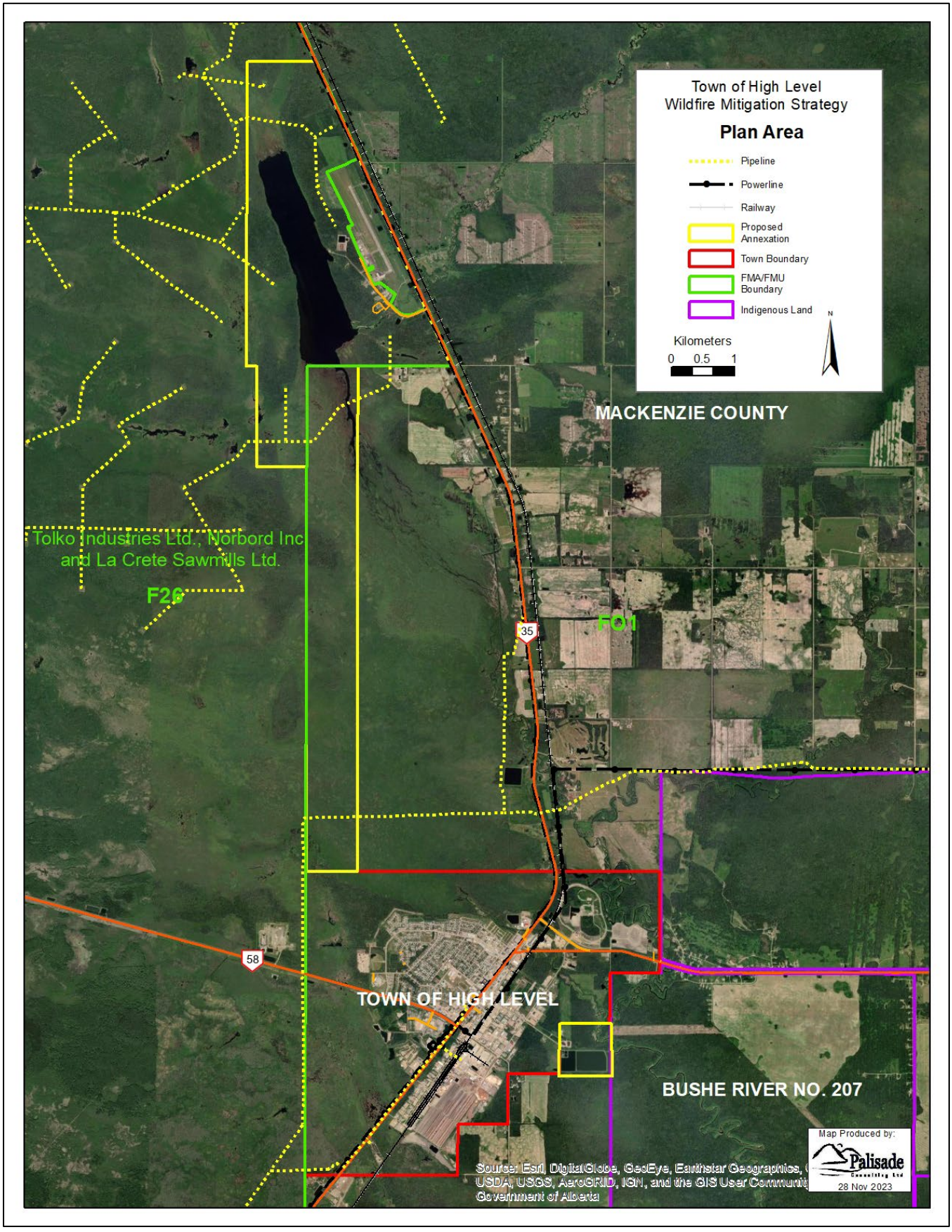
The Town of High Level has the responsibility for administration of land development and fire protection (structural and wildland) within the Town boundary. Through agreements with Mackenzie County and the Dene Tha' First Nation, the Town is also responsible for the structural fire protection in the area surrounding the Town. Mackenzie County and the Dene Tha' are responsible for the administration of land development outside of the Town boundaries on their respective lands. The Forestry Division of Alberta Agriculture, Forestry and Rural Development is responsible for wildfire suppression outside of the Town boundaries within the Forest Protection Area, which encompasses the Town.

The Planning Area is comprised of the Town of High Level and as well as the lands of a proposed annexation from Mackenzie County. These lands include the area around the waste water treatment plant and a corridor leading to and including the Airport

The Dene Tha' First Nation (Bushe River I.R. 207) is located on the eastern edge of the Town.

Tolko Industries Ltd, West Fraser and La Crete Sawmills have harvesting rights on Crown lands outside of the Town. Tolko operates a sawmill within the Town and West Fraser operates an OSB plant just south of High Level. Drax and Tolko Industries formed Northern Pellet Limited Partnership to produce wood pellets.

The following map illustrates the Planning Area for the Town of High Level Wildfire Mitigation Strategy.



Map 1 Planning Area

4 PLANNING STRATEGIES

In June 2023, the Town of High Level initiated development of a strategy aimed at the protection of people and communities from wildfire. At that time, personnel from Palisade met with Project Manager Rodney Schmidt. Resources in the Town of High Level, Wildfire Management Branch and industry were fully committed to wildfire duties across Alberta and are unable to attend formal stakeholder meetings. Consultation with stakeholders was therefore on an individual basis. The participants provided valuable advice and insight in the development of the Wildfire Mitigation Strategy.

4.1 Land Ownership and Dispositions

The lands within the High Level Planning Area are private deeded properties, municipal lands and lands owned by the Province of Alberta. The Town is surrounded on 3 sides by Mackenzie County with the eastern boundary adjacent to the traditional lands of the Dene Tha' First Nation as represented by the Bushe Indian Reserve.

Dene Tha' First Nation

The Bushe River Reserve is one of 3 separate communities of Dene Tha' people. As an Albertan Treaty 8 First Nation, they are governed by an elected Chief and an eight-member council. The Bushe River Reserve No. 207 occupies 11,125 hectares of land immediately east of the Town of High Level. The Dene Tha' public works buildings and the Four Chiefs Complex are located in Bushe River.

The Dene Tha' are solely responsible for the management and administration of their lands. This Strategy did not include Dene Tha' lands.

Timber Dispositions

Tolko Industries Ltd, West Fraser and La Crete Sawmills have a Forest Management Agreement (FMA) outside of the Town of High Level. The FMA provides land and timber to supply logs for their facilities. As an FMA holder, the companies have the right to harvest timber on Crown lands, as well as the obligation to reforest the lands following harvest. They must also develop and maintain a set of short and long-term plans for management of the resources on the allocated lands.

Tolko Industries Ltd operates a dimension lumber sawmill in High Level. West Fraser Timber Co. Ltd; has an oriented strand board facility near High Level and La Crete runs a dimension lumber sawmill and pellet mill near La Crete. Other forest companies operating on the FMA area are; Crestview Sawmills Ltd., Evergreen Lumber Inc., N'deh Limited Partnership, Mercer Peace River Pulp Ltd., Netaskinan Development (GP) Ltd., and Power Wood Canada Corp.

The forest industry is an important component of the economy in the High Level area. It is a major employer in both direct and indirect jobs.

Surface Dispositions

The Lands Operations Division is responsible for managing Alberta's public land for the current and future benefit of all Albertans. Historically, public land management was directed at homesteading and agricultural development in the White (settled) area of the province, and timber management in the Green (forested) area. Today, land management practices and policies must address a greater variety of competing demands -- recreation, watershed management, agricultural uses, industrial uses, commercial uses and conservation.

A number of industrial activities are carried out on the public land outside of the Town including Mineral Surface Leases [MSL], Licenses of Occupation [LOC, DLO], Pipeline Agreements [PLA], Pipeline Installation Leases [PIL], Surface Materials Leases (SML) and Easements [EZE]. Reclamation of industrial and commercial holdings is required for all public land.

Historical and Archeological Sites

The Historical Resources Act, RSA 2000, defines a historic resource as "any work of nature or of humans that is primarily of value for its palaeontological, archaeological, prehistoric, historic, cultural, natural, scientific or esthetic interest including, but not limited to, a palaeontological, archaeological, prehistoric, historic or natural site, structure or object."

The Listing of Historic Resources identifies lands that contain or are believed to contain historic resources, including primarily archaeological and paleontological sites, Aboriginal traditional use sites of a historic resource nature and historic structures. The Listing is normally issued twice a year, to provide industry and other developers with advance notification of possible historic resource concerns.

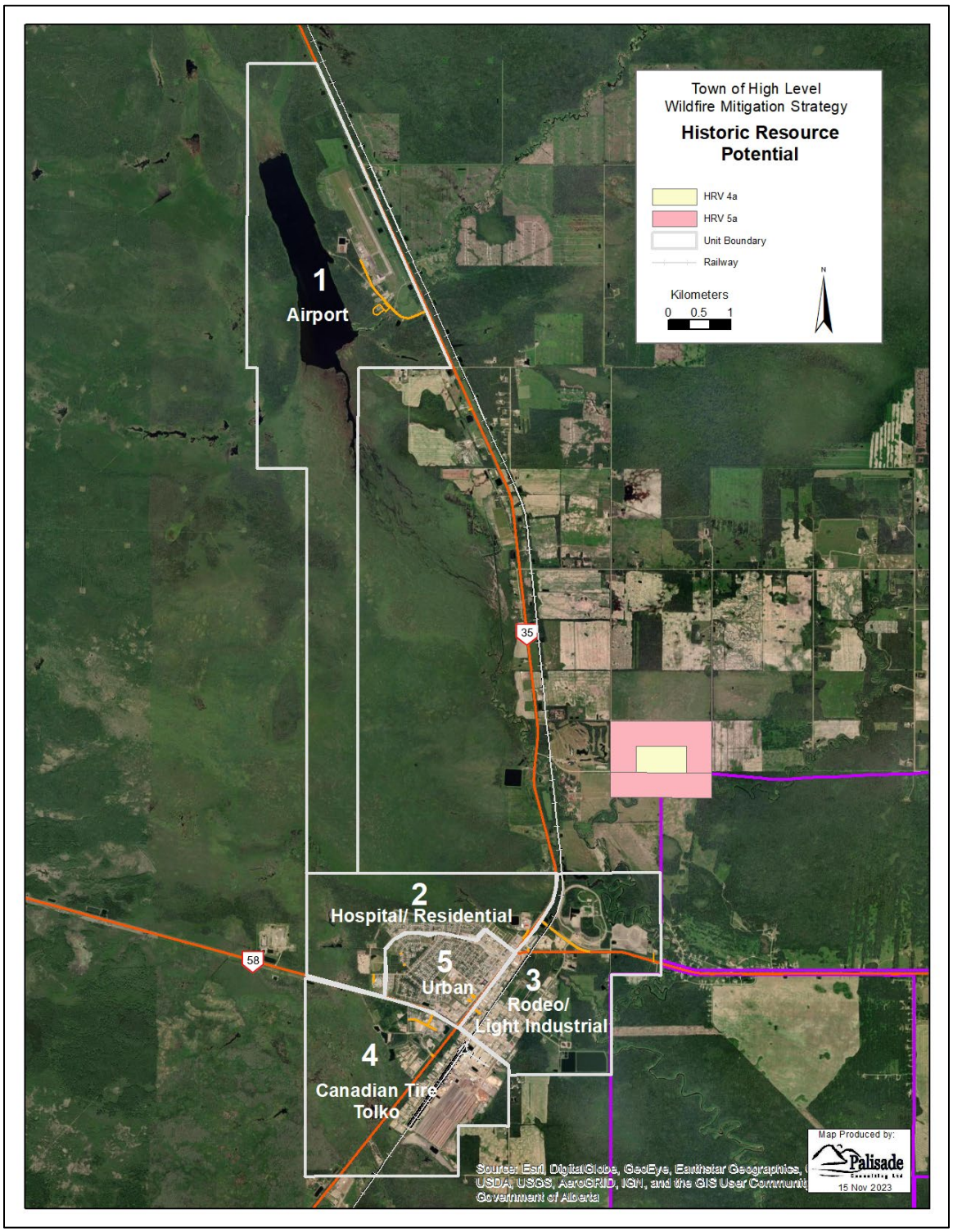
Each land parcel in the Listing has been assigned a Historic Resource Value (HRV) ranging from 1 to 5. The highest level of protection (HRV 1) is afforded to lands that have been designated under the Act as Provincial Historic Resources. An HRV of 1 is also used to identify World Heritage Sites and lands owned by CT for historic resource protection and promotion purposes. HRVs are defined as follows:

HRV 1: Contains a World Heritage site or a site designated under the Act as a Provincial Historic Resource
HRV 2: Deactivated (formerly used to designate a Registered Historic Resource)
HRV 3: contains a significant historic resource that will likely require avoidance
HRV 4: contains a historic resource that may require avoidance
HRV 5: believed to contain a historic resource

The Listing of Historic Resources was obtained through Alberta Culture and Status of Women and is provided specifically for the High Level Planning Area to Fall 2023. It shows two sites north of the Town near the Bushe River. One site believed to contain an archaeological resource in LSD's 14 and 15-10-110-19-W5 and one site containing an archaeological resource that may require avoidance in LSD's 2 and 3-15-110-19-W5. There are no HRV sites within the Town.

Under the Historical Resources Act, the Minister of Culture and Status of Women may designate any historical resource as either a Provincial or a Registered Historic Resource. The Act also empowers Municipalities to designate historic resources of local significance as Municipal Historic Resources. Those resources which have been designated as Provincial, Registered, or Municipal Historic Resources collectively form the Alberta Register of Historic Places.

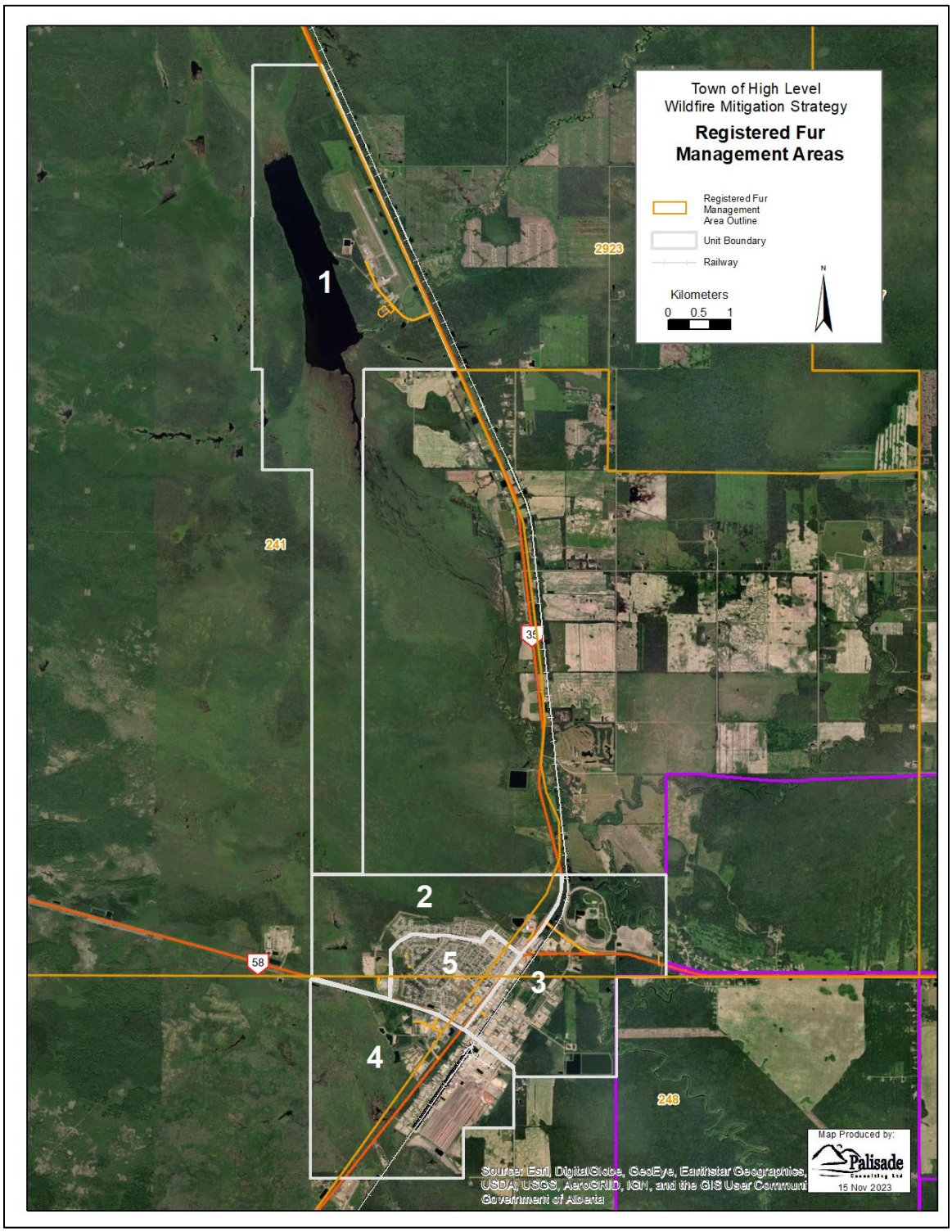
The Forestry Division must consider the Historical Resources Act when developing FireSmart activities on HRV lands.



Map 2 Historic Resource Potential within the Plan Area

Commercial Trapping

There are 3 active Fur Management Areas (traplines) adjacent to the Planning Area being Trapline Numbers: 241, 248 and 2023. Further consultation with the trappers is necessary prior to FireSmart activities which may impact the registered traplines.



Map 3 Registered Fur Management Areas

4.2 Linear Features

There are several linear disturbances located in the Planning Area which have a positive impact on wildfire suppression. The linear disturbances provide for access to remote areas, provide anchor points for ground and air operations and in most cases provide a substantial fuel break. Linear disturbances are illustrated on the Planning Area Map.

Powerlines

ATCO Electric provides electrical services to the Town of High Level and all facilities within the Planning Area. Multiple distribution lines provide electricity within the Planning Area and to the West Fraser mill site. An electrical substation is located within the Town and has been identified as critical infrastructure. The lines throughout the Planning Area are generally well maintained.

Roadways

The roadways within the Planning Area provide significant fuel breaks throughout the area. These roads include Highway 35, a north/south route and Highway 58, an east/west route, which intersect within the Town. Each of these major roadways can serve as a fire containment line. There are multiple Town roads throughout the Planning Area which serve various purposes.

Pipelines

There are several pipelines in the Planning Area. Apex provides natural gas service to the region. A natural gas pumping station is located south of the Town and has been identified as critical infrastructure.

Seismic Lines

The Planning Area has multiple seismic lines throughout.

Railway

Canadian National Railways bisects the Planning Area with a north/south route that runs parallel to Highway 35. This is major supply infrastructure for communities in Alberta and beyond.

Recreational Trails

Town of High Level has a network of hiking and snowmobile trails which are barriers to fire spread and may be used for access in the event of a wildfire.

High Level Fire Guard

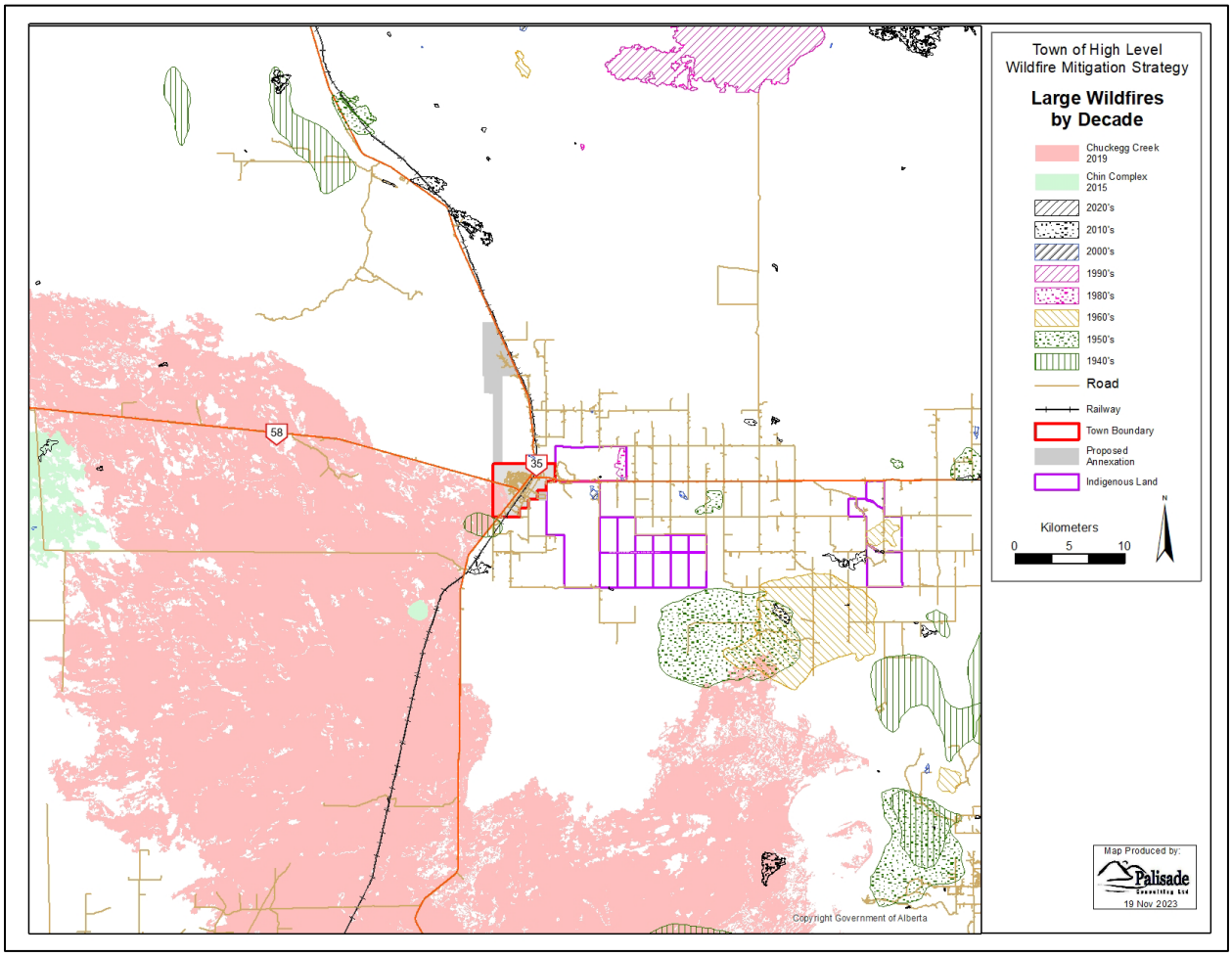
During wildfire HWF-042-19, a dozer guard was constructed by the Wildfire Management Branch around the northwest part of High Level between Highway 58 and Highway 35. The guard is 3.5 kilometers long, between 22 and 30 meters wide and covers approximately 10 hectares. The guard was constructed by dozers which cleared the forest and piled the debris in the middle of the guard. It was decided that the guard would be reclaimed for use as a long-term fuel break and as access for firefighters during future wildfires. The guard is used for a wide range of recreational activities.

During the Basset Lake wildfire of 2023, the Forestry Division enhanced the protection of the Town with construction of a contingency line, west of the Town of High Level, working west off of Highway 35 near West Fraser and then heading north towards Highway 58. This guard was completed in September 2023.

5 FIRE HISTORY

Wildfire is a natural and frequent occurrence within the boreal forest region of Alberta. Both lightning and human-caused wildfires are common within and adjacent to Town of High Level throughout the wildfire season.

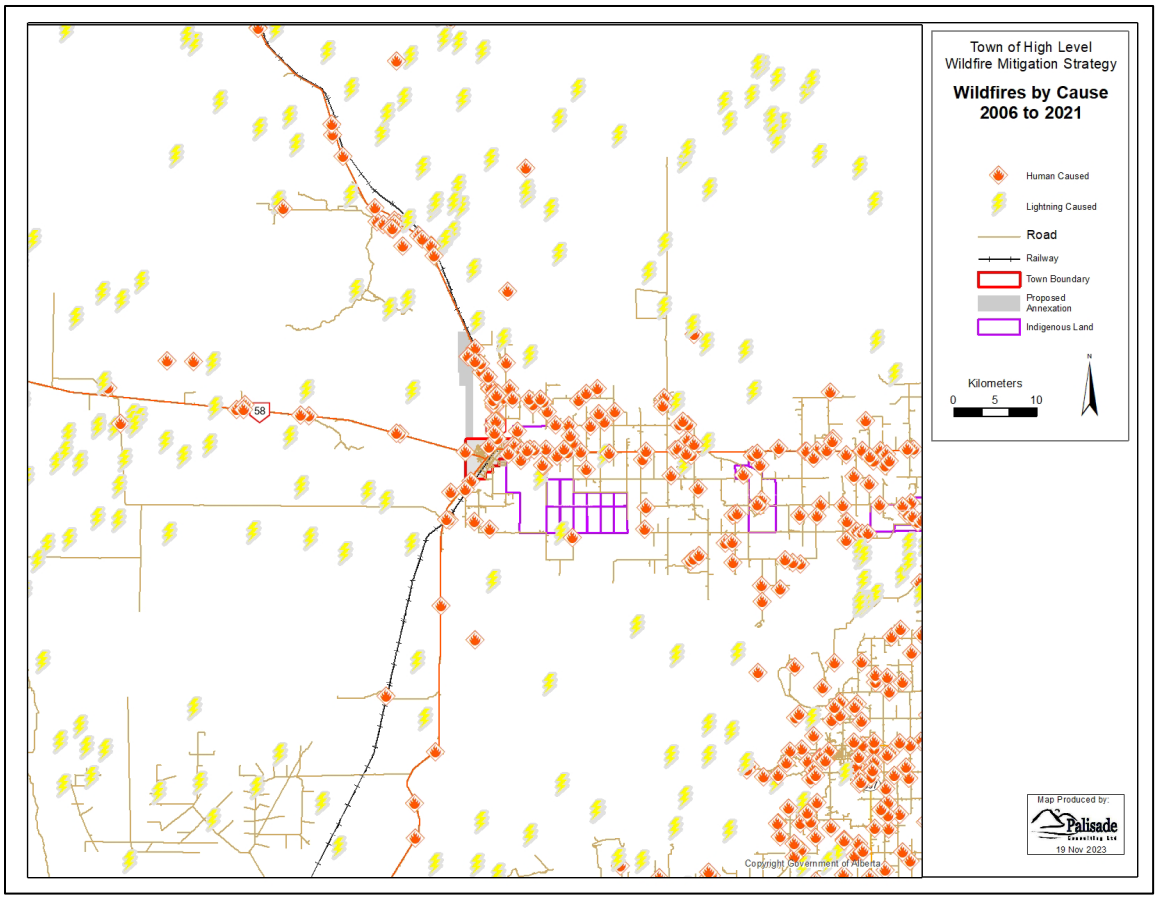
On the landscape level, there have been major wildfires in the vicinity of High Level between 1940 and 2020. These fires generally spread in northwesterly direction.



Map 4 Large Fire History 1940 to 2020

Within the vicinity of Town of High Level, as shown on the map below, there were 501 wildfires between 2006 and 2021. The majority (314) were human caused while 187 were ignited by lightning. Response to these fires was recorded by the Forestry Division.

Based on this historical Forestry Division data, there is the potential for an average of 33 fires per year near High Level. The largest number of wildfires occurred during the spring and fall fire season when the grass is in the cured stage and the deciduous trees are leafless.



Map 5 Wildfire History 2006-2021

The Forestry Division is responsible for the response to wildfires outside of the Town within the Forest Protection Area. The Wildfire History map represents only fires actioned by the Forestry Division. Town of High Level does not have spatial data for their response to wildfire incidents within the Town.

6 WILDFIRE THREAT

The wildfire threat assessment is a process that evaluates the negative ecological, social and economic impacts of wildfire. Four components are combined and evaluated to identify those areas on the landscape most threatened by wildfire.

The Town is located within the Boreal Forest Natural Region. Short summers, long, cold winters and vast deciduous, mixedwood, and coniferous forests interspersed with extensive wetlands characterize the Region. This is Alberta's largest Natural Region; it occupies over half the Province and includes eight Natural Subregions. The Planning Area is within the Dry Mixedwood Natural Subregion which is characterized by undulating plains, aspen-dominated forests and fens. Sixty to seventy percent of annual rainfall occurs between April and August. Wildfire occurrence within the region is frequent. (*Natural Regions Committee, 2006*).

The greatest wildfire threat to Town of High Level will occur during the spring of each year during the cured grass stage. The location and type of forest fuels are the primary factors influencing the wildfire threat. Fire behaviour fuels within the Town of High Level are predominantly D1 (aspen) and O1a (grass) with some C2 (conifers) in the industrial area and Rodeo Grounds. D1 fuels surround the Town with larger dead willow and grass wet areas north and south which are highly flammable in the spring of each year during the cured grass stage. There are small pockets of C2 (black spruce) along the Town boundary. Larger agricultural lands can be found south, east and northeast of the Town. Many linear disturbances and clearings within the Town boundary have a heavy growth of grass. The Fire Guard of 2019 has revegetated to heavy grass which should be modified in the future to prevent an increased wildfire hazard.

The Wildland-urban Interface assessment within Town of High Level considered the four components of wildfire threat:

Fire Behaviour Potential

Fire behaviour is the manner in which fuel ignites, flame develops, fire spreads and exhibits other related phenomena:

- Assessment of fuels
- Fire weather and climate assessment
- Topography and fire interactions
- Existing barriers to fire spread
- Fire growth potential and landscape interactions

Fire Occurrence

Fire occurrence risk is the probability of fire igniting as determined by presence of causative agents (i.e., potential number of ignitions).

- Assessment of fire probability depending on weather and fuel moisture
- Seasonal changes (moisture regime, green-up stages)
- Causes- human, lightning, etc.
- Other potential ignition sources (i.e., burning coal seams.

Values at Risk

Values at risk are a specific or collective set of natural resources and man-made improvements and/or developments that have measurable or intrinsic worth which could potentially be destroyed or otherwise altered by fire in any given area. The specific values and priorities within the Forest Protection Area are identified by Provincial Priorities in Fire Suppression.

Suppression Capability

Suppression capability includes the factors and limitations that are related to the ability to contain a wildfire upon detection in order to protect values at risk.

LANDSCAPE BIOPHYSICAL ELEMENTS

- Steepness of terrain/slopes
- Topography/valley orientation
- Water availability (lakes, river, non-draining borrow pits)
- Existing barriers to fire spread (non-fuels, deciduous stands, linear disturbances, hydrography

NON-BIOPHYSICAL ELEMENTS

- Detection
- Initial Attack response time targets by fire danger and fire management areas
- Access availability (all weather and dry weather roads)
- Anchor points and helipads
- Attack weight, capability of resources dispatched

6.1 Fire Behaviour Potential

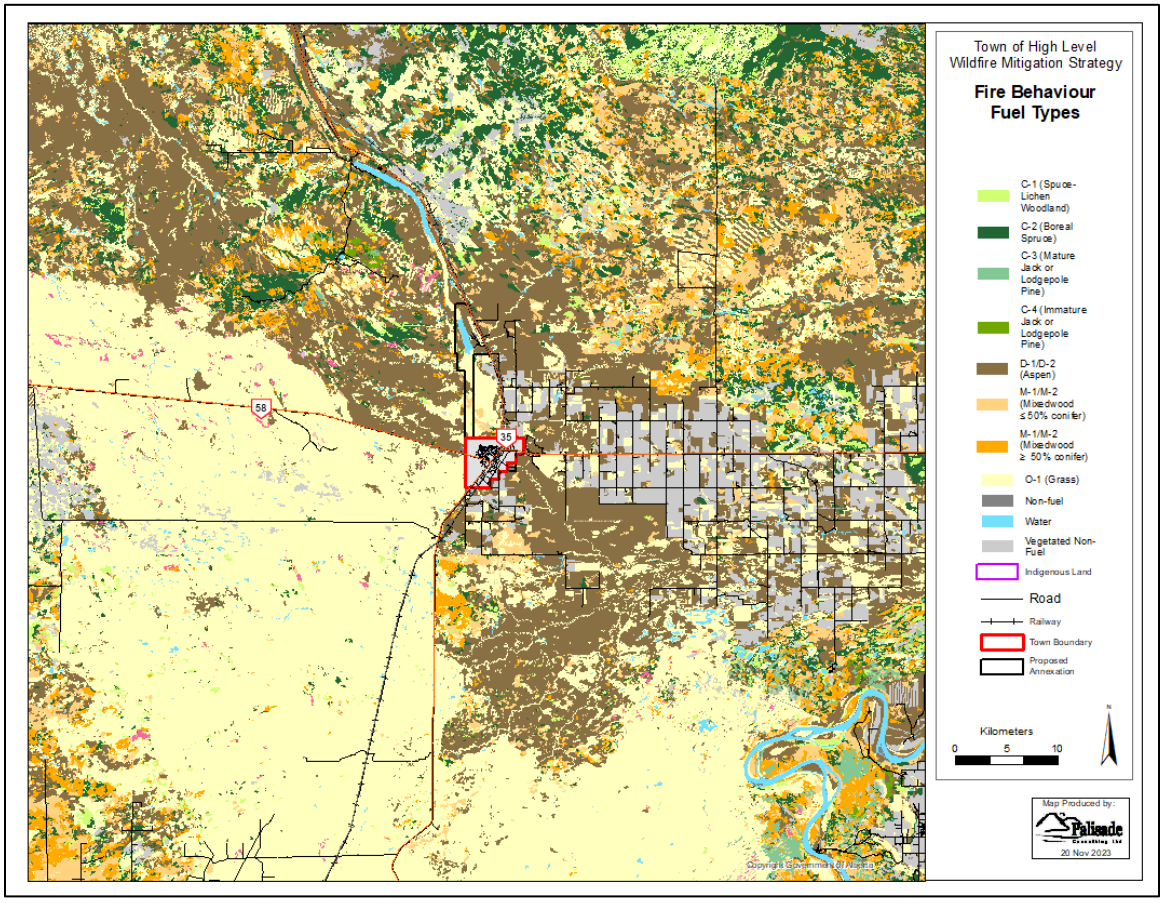
Fire behaviour is the manner in which fuel ignites, flame develops, and fire spreads and exhibits other related phenomena. The key components of fire behaviour are fuels, weather and topography. Fire growth and landscape interactions determine the fire's capability to spread. The utilization of barriers to fire spread during a wildfire event is an appropriate FireSmart strategy that ensures the protection of communities within forested areas.

Fuels

Fire behaviour fuels within the Town of High Level are predominantly D1 (aspen) and O1a (grass) with some C2 (conifers) in the industrial area and Rodeo Grounds. D1 fuels surround the Town with larger dead willow and grass wet areas north and south which are highly flammable in the spring of each year during the cured grass stage. There are small pockets of C2 (black spruce) along the Town boundary. Larger agricultural lands can be found south, east and northeast of the Town. Many linear disturbances and clearings within the Town boundary have a heavy growth of grass. The Fire Guard of 2019 has revegetated to heavy grass which should be modified in the future to prevent an increased wildfire hazard

The Chuckegg Creek fire of 2019 had a dramatic impact on wildland fuels. Prior to the fire, the fire area was primarily deciduous, grass and coniferous. These fuels were burned in the fire and the fuel has transitioned to grass, as shown on the attached map. It must be noted that the fire behavior was not homogeneous, leaving islands of fuel. Some of the fuel remaining suffered varying degrees of fire damage resulting in unburned crowns and ladder fuels.

It is critical to note that many of the deciduous types have seen a succession to mixedwood fuels as the previously immature coniferous has become established in the forest cover. This transition is not reflected in the Fire Behaviour fuel types or potential.



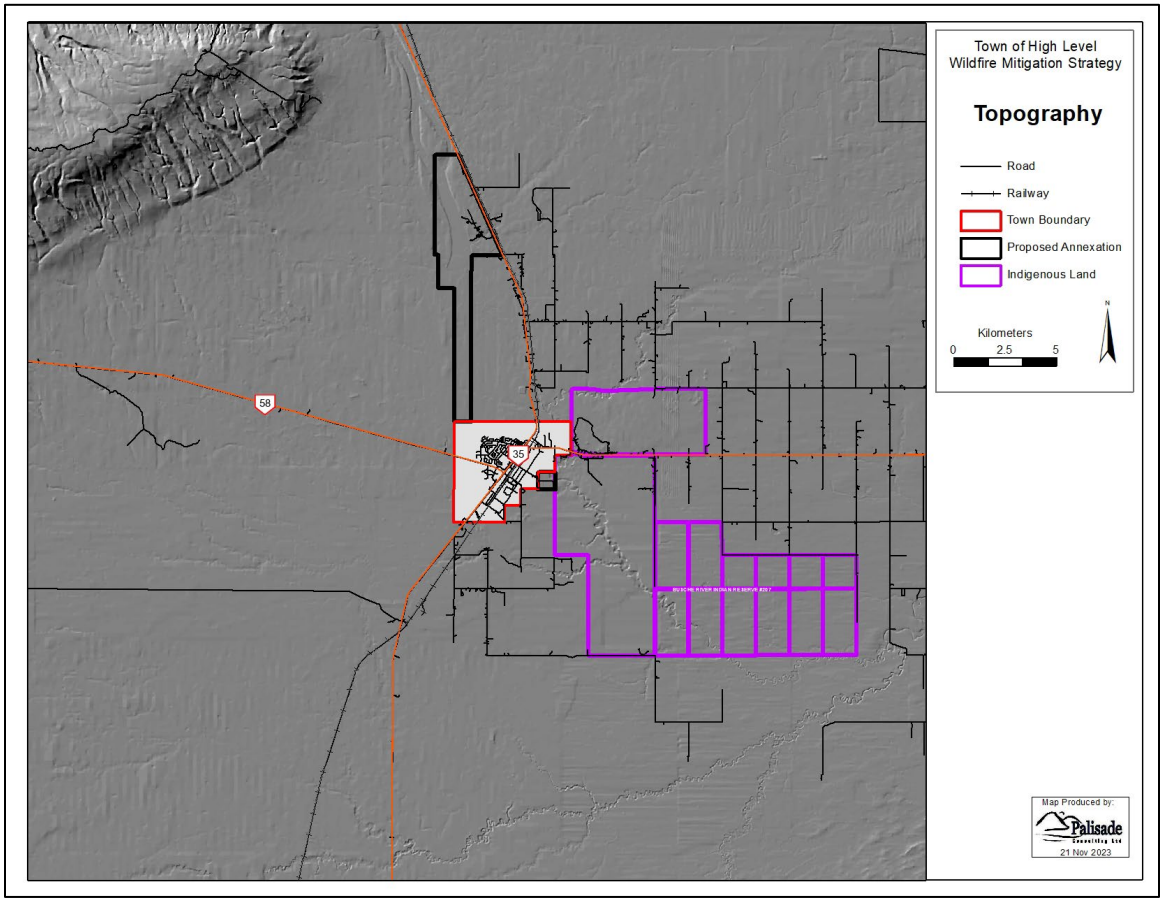
Map 6 Fire Behaviour Fuels

Topography

In general, fires burn more quickly up slopes than on flat ground, resulting in an increased rate of spread. It also influences sun exposure, with south-facing slopes normally warmer and drier than north-facing slopes. In addition, narrow canyons can act as tunnels with higher wind speeds.

The region is dominated by Watt Mountain and its associated land forms. Watt Mountain Lookout is located at the apex of the Mountain. In this area, topography will have an impact on fire.

The Planning Area for the strategy is described as flat with minor drainages. Topography will not have an impact in the Planning Area.



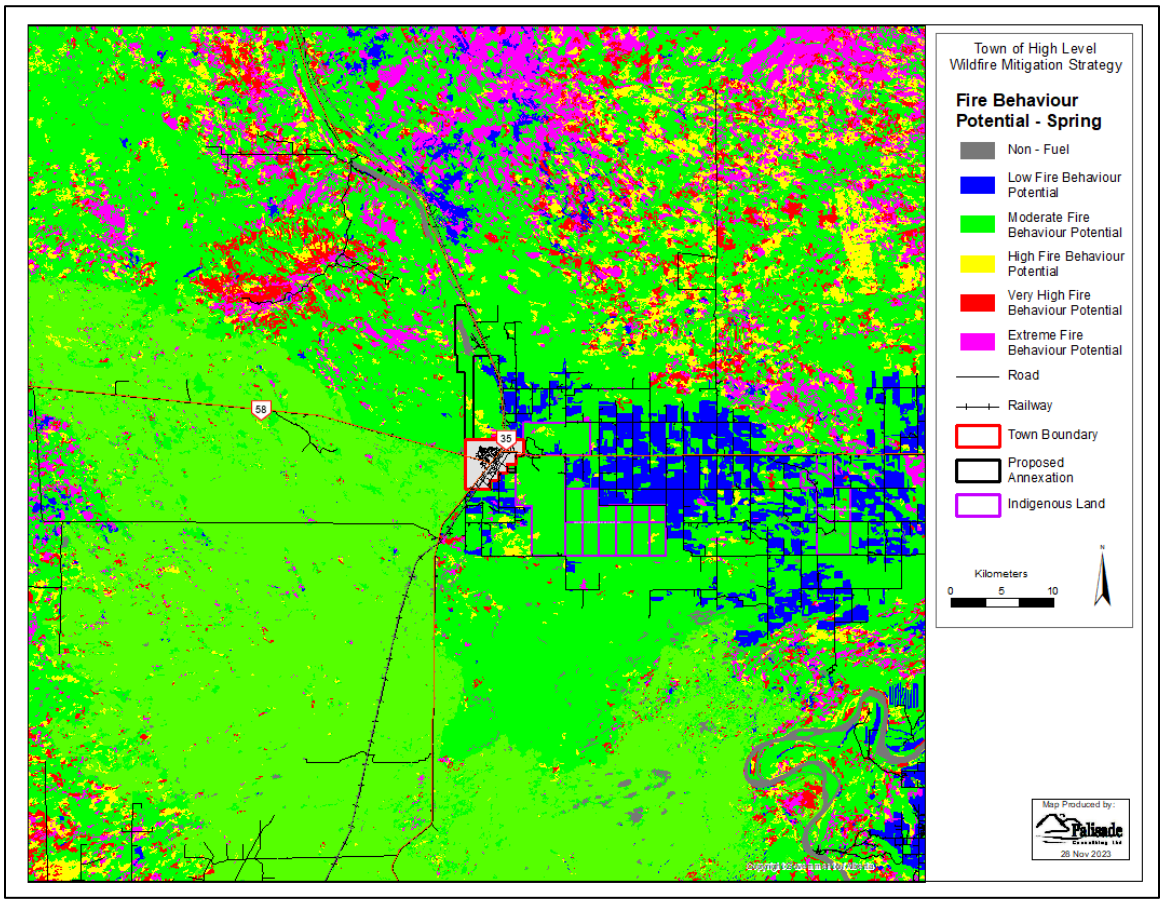
Map 7 Topography

Season

Susceptibility to burning changes during the year, due to changing weather and vegetation conditions. Using data on vegetation and weather conditions, fire behaviour potential can be modeled for spring, summer and fall. The Fire Behaviour maps include analysis of:

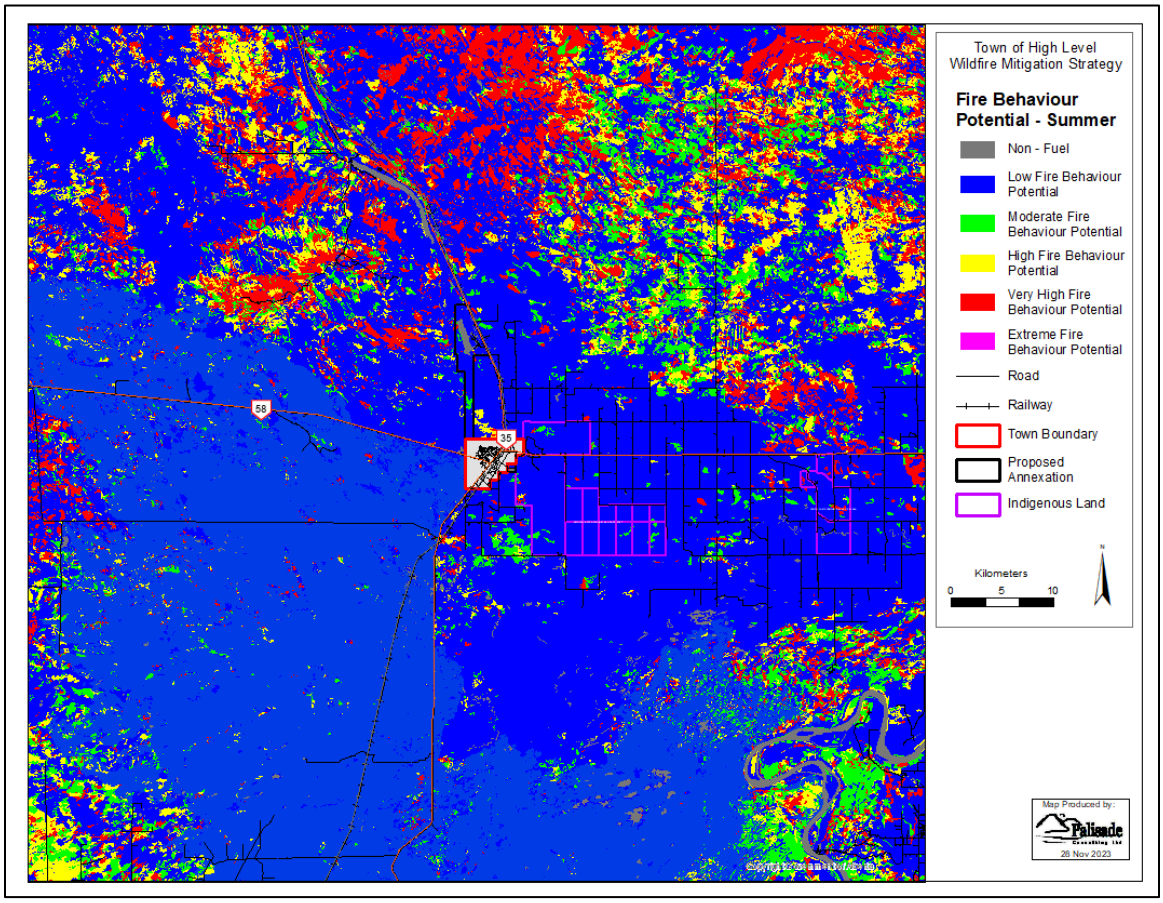
- Fire behaviour prediction fuel types
- Historical fire weather information
- Topography and fire interactions

In the spring period, March 1st to May 31st, the grass is cured, the deciduous forest floor is exposed to solar heating, and the coniferous foliage is in a state when the foliage moisture is at its lowest levels making the coniferous fuels highly flammable and very susceptible to crown fires.



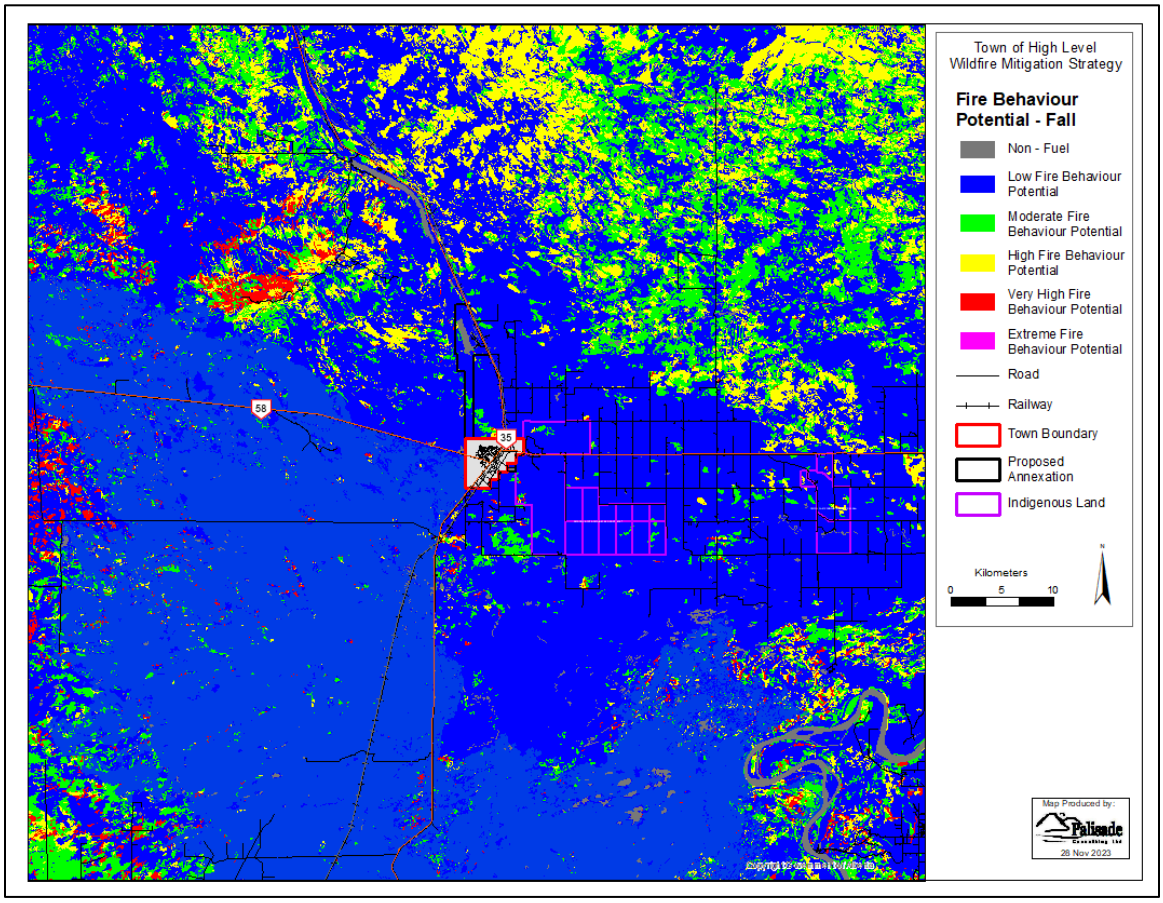
Map 8 Fire Behaviour Potential Spring

In the summer period June 1st to August 31st, the grass fuels are green. In the deciduous stands, leaves have flushed and provide shade to the surface fuels. In the coniferous stands, the foliage is transpiring at full capacity which increases the foliage moisture content to its average level, making the forests less flammable during this period. However, the coniferous C2 fuels are flammable and can exhibit erratic, high intensity fire behaviour during the summer period.



Map 9 Fire Behaviour Potential Summer

In the fall period, September 1st to the end of October, the grass fuels are again cured and the deciduous leaves fall, allowing the solar energy to dry the surface fuels making them more flammable. The dead willow and grass areas will again exhibit moderate fire behaviour potential. However, the burning period is reduced due to the shorter days. During dry periods with low relative humidity, the coniferous C2 fuels will burn with high intensities and rapid-fire spreads area possible with strong winds.



Map 10 Fire Behaviour Potential Fall

Wildfire Spread Direction

The wildfire spread direction for each season will be determined by the associated wind direction for the specific time period. The wind rose shown in Figure 1 is a graphic of the average daily wind speed and direction at the High Level airport. Each bar's length indicates the proportion of the time the wind blew from that direction. Data from October 2020 to November 2023 show that winds have a high probability of being from the North or Southeast. Fire spread will likely be consistent with the direction.

Large fire history in the area shows that south and southeast winds in the spring tend to be problematic and are associated with many large fire runs in the spring. During the summer and fall seasons, the winds in Town of High Level have a higher probability of being from the north quadrant which means the fire spread is more likely to be from the north to the south during the summer and fall periods.

The wind roses also indicate that the gusty winds are often in the same orientation.

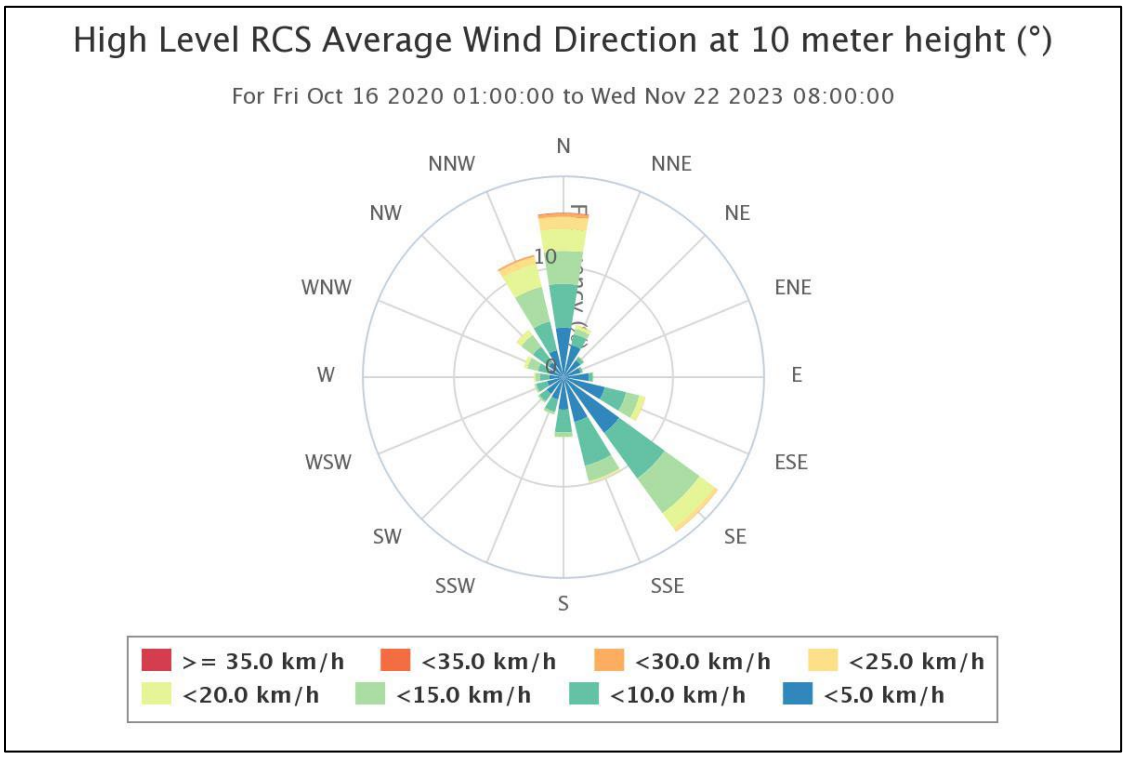


Figure 1. Winds at High Level weather station

6.2 Fire Occurrence

Current Forestry Division fire data indicate that the predominant wildfire cause around the Town of High Level remains human caused.

6.3 Suppression Capability

Suppression capability includes the factors and limitations that are related to the ability to contain a wildfire upon detection in order to protect values at risk.

There are a number of available man-made and natural water sources available for wildfire suppression that can be used by helicopter buckets and municipal firefighting apparatus. There are fire hydrants located within the Town, Tolko and at the West Fraser mill site. Access on all roads within the Planning Area is excellent.

Town of High Level and the Forestry Division have a Mutual Aid Agreement and an Annual Fire Control Plan to guide their cooperative efforts in wildfire suppression, detection and prevention. The Town of High Level has a Regional Service Sharing Agreement with Mackenzie County to provide services to that jurisdiction. The Town is a partner with the Northwest Alberta Emergency Resources Agreement which brings a wide range of resources from throughout northern Alberta. The Town also has a service agreement with the Paddle Prairie Metis Settlement.

Watt Mountain Lookout is located 25 km northwest of the Town of High Level which provides excellent wildfire detection capability in the region.

The Forestry Division operates a Primary Fire Base which would serve the Town. The base is located at the airport within the Planning Area. Resources at the base have the capability of prompt initial attack with heavy equipment, helicopters and firefighters. They have multiple

sprinkler kits and a Provincial Structure Protection Unit at the forestry warehouse in High Level. They also have a full range of wildfire suppression equipment (pumps, hose, nozzles, PPE).

The High Level Air Tanker Base is located within the Planning Area, within the proposed annexation area. The base has the capability to support a wide range of aircraft with various wildfire retardants. As an alternative, the Manning Air Tanker Base is located 175 kilometers to the south. There are several lakes in the vicinity which are suitable for skimmer air tankers.

Tolko Industries enhances fire protection services to the mill site with an engine and Emergency Response Team. They have Emergency Response plans for the facility. Tolko operates a water reservoir and hydrant system.

Town of High Level Fire and Rescue operate a Fire Station in the Town. The Town of High Level have committed substantial resources to provide the Fire Service with the necessary equipment to suppress fires within their jurisdiction. The Fire Service has a wide range of municipal fire apparatus and firefighters. The Service operates 3 Type 1 Engines, 3 Type 6 Engines, 1 T1 Tender, 3 Rescue, 2 Structure Protection Units, Air Supply Trailer, Cargo Trailer, Utility Truck and 2 Command Units. All apparatus carry forestry equipment.

Photo 1 Town of High Level Aerial

Apparatus is well equipped to respond to wildland fires. It has a wide range of equipment including sprinklers, forestry hose, portable pumps, generator, water backpacks, class A foam, water tanks and wildland hand tools. Tenders have portable drop tanks to allow for rural water shuttle operations. On the apparatus and in the structure protection unit, the Service maintains an inventory of forestry hose, sprinklers and Mark III Fire Pumps.

The Town has a full time Wildland-urban Interface firefighting crew of four firefighters and associated equipment. The crew serves 40-hour weeks and has a type 3 engine, type 6 engine and the type 2 structure protection unit available for response either in the community or on provincial deployment. The crew serves in a wide variety of roles: emergency response to incidents, fire prevention, equipment maintenance and training. The crew works along with a similar crew in Rocky Mountain House, funded by the Government of Alberta.

Members of the Crew have been trained by FireSmart Canada to conduct Advanced FireSmart Home Assessments.

Town of High Level operates certified water systems and fire hydrants which are compliant with relevant standards for firefighting water supply. This information is included within the Wildfire Preparedness Guide.

7 SITE HAZARD ASSESSMENTS

The Town of High Level Planning Area includes a wide variety of urban development ranging from residential, industrial and commercial. The environmental setting is just as diverse: with wetlands, muskeg, grasslands, agricultural lands, coniferous forest, deciduous forest and mixedwood forest. The diversity of the urban development and the environmental setting poses a challenge for Wildland-urban Interface planning.

The Town has been stratified into five Units of similar structures and vegetative forest cover to accommodate the assessment description. Wildland-urban Interface hazard assessments were conducted within and adjacent to developed areas to quantify and identify Wildland-urban Interface hazards.

There are five distinct regions within the Town. There were several common denominators in the Assessment Areas within these regions.

Within Urban/Rural Development

Access for emergency vehicles into these areas and to individual structures was found to be adequate. Structural and wildfire suppression service is provided by High Level and response times to these areas meets the expectations of the Town. Outside of the Town, Wildfire suppression and management is the responsibility of the Forestry Division. Water systems with fire hydrants serve the Town, Tolko and West Fraser mill site.

Forested Lands

Access for emergency vehicles into this area is limited to off highway vehicles using trails, clearings, and power lines. Wildfire suppression and management is provided by the High Level Fire Department and Forestry Division and response times to this area may be delayed due to access, resources and fire behavior. The Forestry Division may utilize helicopter and air tanker resources for rapid initial attack.

Wildfire suppression and management in the Forest Protection Area is the responsibility of the Forestry Division.

Wildland-Urban Interface (WUI) refers to any developed area where conditions affecting the combustibility of natural and cultivated vegetation (wildland fuels) and structures or infrastructure (built fuels) allow for the ignition and spread of fire through these combined fuels (Mowery, Read, Johnston, & Wafaie, 2019). The manual *FireSmart – protecting your community from wildfire*, by Partners in Protection, contained two classifications:

- "Classic" wildland-urban interface where development and wildland fuels meet at a well-defined boundary.
- "Intermix" wildland-urban interface where development and wildland fuels intermingle with no clearly defined boundary.

The Town of High Level displays both classic and intermix types of interface.

7.1 Overview of Planning Units

The Wildfire Mitigation Strategy has been developed in a manner to recognize the diversity of the environment and the urban development. The Town has been divided into 5 distinct Units which are each unique to the Town. These Units are shown on the following maps and are described as follows:

Table 1. Planning Units

Unit #	Unit Location
1	Airport
2	Hospital/Residential
3	Rodeo/Light Industrial
4	Canadian Tire/Tolko
5	Urban

7.1.1 Assessments

Wildland-urban Interface assessments were conducted on each of the Units within the Town. These assessments identify both the wildfire risk to the community and establish priorities for mitigation.

The assessments were conducted in two forms. In the "Structure and Site Assessment," the structures and the environment within 30 meters of the structures are evaluated. In the "Area Hazard Assessment," the area outside of the 30-meter zone is evaluated. The combination of these two assessments was then utilized to develop and prioritize the mitigation strategy, to collect hazard rating information in a consistent manner, and then quantify the Wildland-urban Interface hazard. The assessments were conducted according to standards established by FireSmart Canada and the Forestry Division to collect hazard rating information in a consistent manner and then quantify the Wildland-urban Interface hazard.

"Structure and Site Hazard Assessments" were performed within each Planning Unit of Town of High Level. The assessment evaluates eleven factors within 30 meters of the structure that have the greatest influence on structure survival during a wildfire:

1. Roofing material
2. Roof cleanliness
3. Siding material
4. Eaves, vents, and openings
5. Balcony, decks, or porches
6. Window and door glazing
7. Location of woodpiles and combustibles
8. Setback from edge of slope
9. Forest vegetation
10. Surface vegetation
11. Ladder fuels

Although the assessment process was originally designed for individual residential developments, the Planning Units within Town of High Level were found to have typical developments within each area. Palisade was able to derive average conditions for each Unit which was then used for the structure and site assessment. It is important to realize that individual structures within a Unit could have a higher or lower hazard based on the type of structural materials and amount of vegetation-free zone for that particular structure.

"**Area Hazard Assessments**" were completed in representative coniferous, deciduous, mixedwood and grassland vegetation types within each Unit for the area beyond 30 meters from structures. This assessment provides an evaluation of:

12. Forest vegetation
13. Surface vegetation
14. Ladder fuels
15. Slope
16. Position on slope

"**Structure and Site Hazard Assessments**" and "**Area Hazard Assessment**" values were calculated and a hazard class was assigned based on the following range of values:

Table 2. Hazard Classes

Site Hazard Class	Hazard Value
Low	< 21
Moderate	21 – 29
High	30 – 35
Extreme	> 35

All assessments were completed assuming extreme fire weather indices and low fuel moisture content (e.g., grass is in a spring/fall cured state). Results for typical vegetation types were obtained from Area Hazard Assessments. This information can be used to identify developments adjacent to high or extreme hazard sites and to guide managers in setting priorities for mitigation. They are also useful for elected officials, developers, municipal planners, and fire officials to identify Wildland-urban Interface area hazards prior to planning or approving developments.

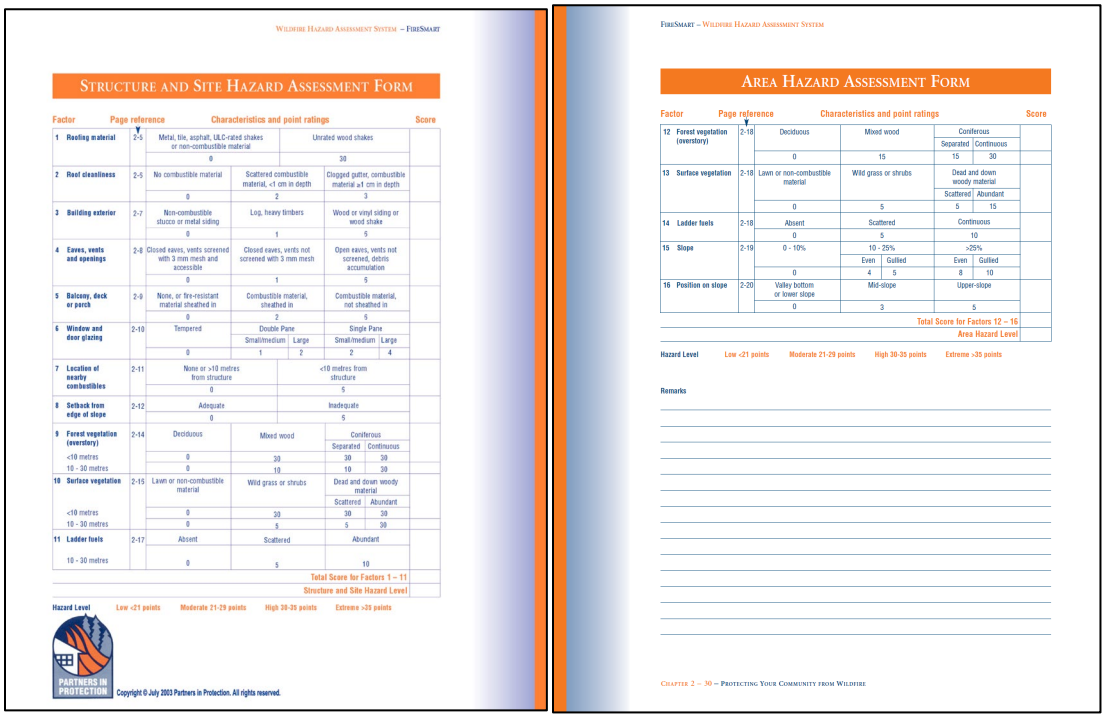


Figure 2 Assessment Forms

The assessments contain reference to the forest fuel types. The Canadian Forest Fire Behaviour Prediction System was utilized as a systematic method for assessing wildland fire behaviour potential. It is a series of mathematical equations relating fire characteristics to wind, fuel moisture, and topographic conditions for sixteen benchmark fuel (vegetation) types.

The fuel types in the study area include the following:

Table 3. Fuel Types

FUEL TYPE IDENTIFIER	DESCRIPTION	CHARACTERISTICS
C1	Spruce-lichen woodland	Open/sparse spruce/tamarack stands.
C2	Boreal spruce	Moderately-dense to dense White/Black spruce stands. May display extreme fire spread.
C3	Mature Pine	Pine
D1/D2	Leafless aspen	Deciduous stands dominated by Trembling aspen. Low spread rates.
M1/M2	Boreal mixedwood	Mixedwood stands with spruce, pine, or aspen. Moderate fire spread rates.
O1	Matted grass	Cured grasses. High spread rates in spring and fall due to fine fuels and fully open to the wind.
S1	Pine Slash	Fuels remaining in cutblocks after harvesting.

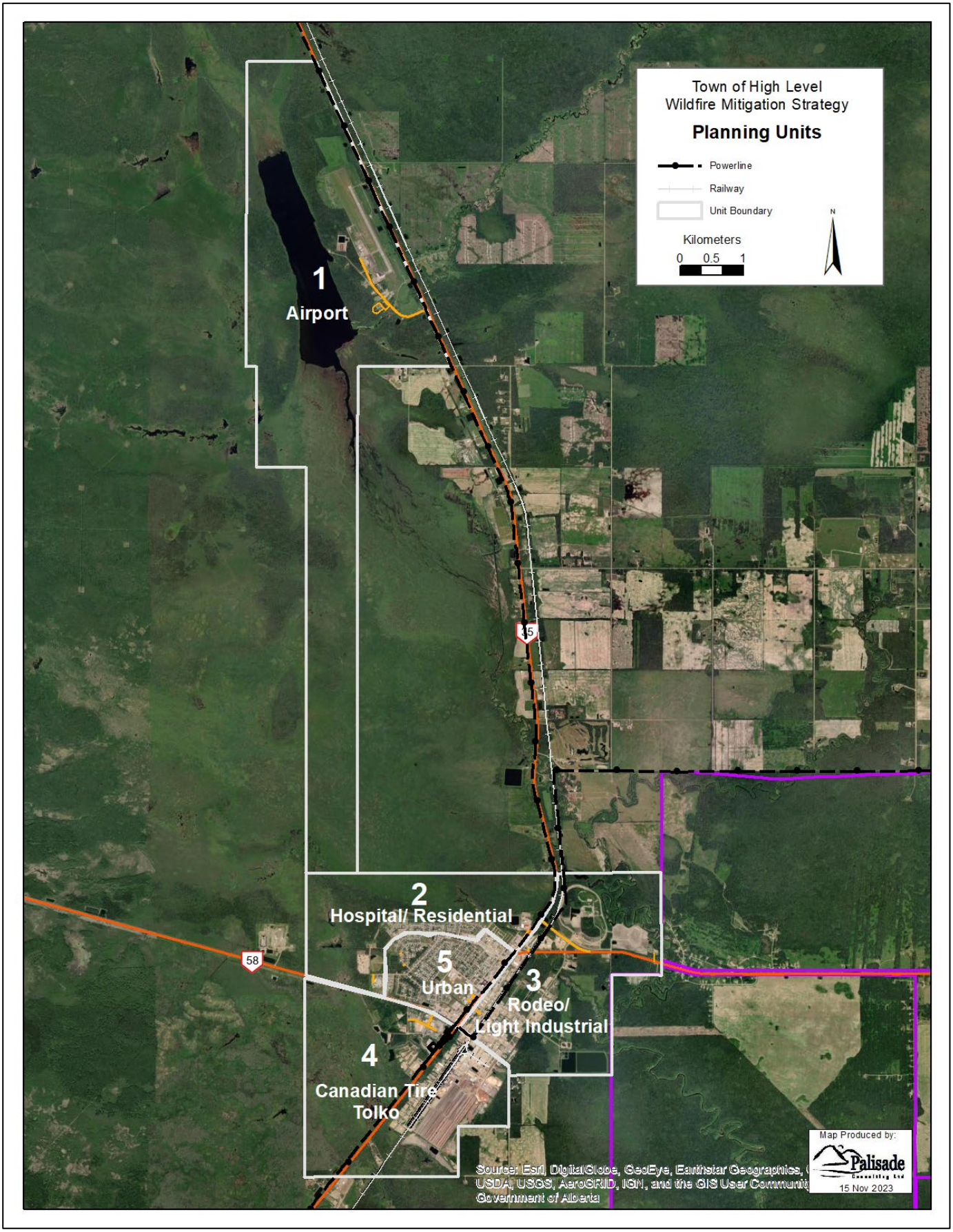
Palisade also utilized the FCCRP Community Wildfire Hazard Assessment Form to quantify the hazards within the Planning Area. This form provides an evaluation of the overall community wildfire hazard-the prevailing condition of structures, adjacent vegetation and other factors affecting the FireSmart status of small communities or neighborhoods. This hazard is based on the hazard factors and FireSmart recommended guidelines found in FireSmart: Protecting Your Community from Wildfire.

The Units where Wildfire Hazard and Assessment are described as:

Table 4. Planning Units

Unit #	Unit Location
1	Airport
2	Hospital/Residential
3	Rodeo/Light Industrial
4	Canadian Tire/Tolko
5	Urban

The Planning Units for the Strategy and the Wildfire Hazard and Assessments Units are displayed on the following map.



Map 11 Planning Units

7.2 Unit 1 Airport

The Airport Unit is a land bridge from the current Town boundary to the Airport. The corridor from the Town to the Airport is forested without any residential dwellings. The Airport is owned and operated by the Town of High Level. The Airport area is comprised of a runway, terminal building, hangers, Air Tanker Base, Fire Center, Fire Base and residential dwellings.

The dwellings of Cottonwood are owned by the Government of Alberta and are occupied by Government employees. Behind the Fire Center, there are 13 residential lots of which 8 have dwellings. At the Fire Base, there are bunkhouse trailers, a kitchen and an expansion area for tents. On the Airport side, there are an additional 4 residential dwellings and a Forestry bunkhouse. During the Fire Season, it would be expected that there could be up 70 persons accommodated at the Airport. The dwellings are typically manufactured or stick built on site construction. In addition to the Terminal Building, there are several private and commercial shops/hangers.

The area has Mackenzie County rural addressing, however, there is no signage.

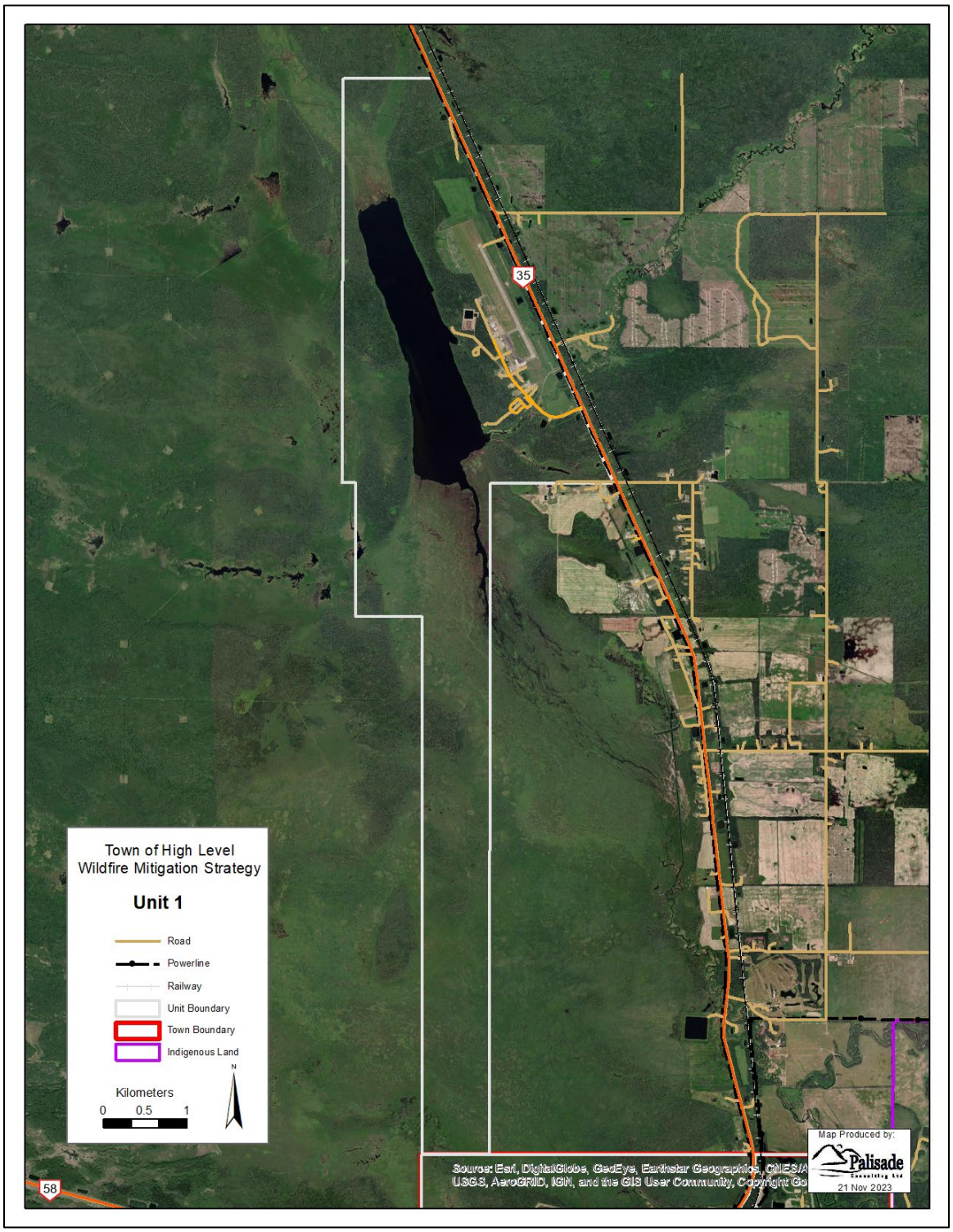
Pierre's Pond is a small recreation area at the airport. The parking lot at Footner Lake is a popular recreation area and there is a system of trails on the south side of the lake.

There are fire hydrants in the community served by a water treatment plant and reservoir. In addition to the hydrants, there is an abundant supply of water for firefighting at Pierre's Pond, Footner Lake and the Air Tanker Base. The prominent values at risk in the Unit are the dwellings, commercial buildings, Wildfire Management facilities and the Airport Terminal.

The Unit is comprised of grass and mixedwood fuels. There are isolated stands of coniferous C2 fuels within the mixedwood type. These fuels along with the coniferous content of the Mixedwood stands will exhibit Moderate Wildfire Behaviour Potential in the spring and Low in the summer and fall.

Once annexed, the Unit will be contained within the Town of High Level and the Town will have the responsibility for structural fires and wildfires. Wildfire suppression outside of the Unit is the responsibility of the Forestry Division. The Fire Service has good access to all developed areas within the Unit. Wildfire suppression in the undeveloped forested area of the Unit would be dependent on access, resources and fire behaviour. The response time for the Fire Service would be within 20 minutes.

The following map illustrates the Planning Area for the Airport Wildfire Hazard and Risk Assessment.



Map 12 Overview of Unit 1

STAKEHOLDERS

The lands within the Airport Unit will be located in Town of High Level. The lands are both private deeded properties, municipal properties and Crown Land. The surrounding lands are within Mackenzie County.

There are numerous seismic lines and trails in the Unit which can have a positive impact on wildfire suppression. The linear disturbances provide access to remote areas, provide anchor points for ground and air operations and may provide barriers to fire spread if widened and maintained.

Atco provides electrical services to the High Level area. The lines throughout the Unit are generally well maintained.

The primary access road to the Unit is Highway 35. Footner Drive provides access to the Airport and Cottonwood Drive provides access through the Cottonwood Residential Area. These roads provide significant fuel breaks throughout the area and can serve as fire containment lines. The airport runway and right of way provide a substantial fuel free barrier.

The Unit provides access to Footner Lake for recreational purposes.

Photo 2. Values at Risk

7.2.1 Hazards

- The area is used by a wide variety of recreational users and the use of ATVs is common.
- The grass fuel types along the roadways, powerlines and Airport have the potential to quickly spread to the Values at Risk. Generally, these rights of way are well managed grass.
- On some of the properties, there is storage of combustible materials in the Immediate, Intermediate and Extended Zones.
- The coniferous fuel content of the mixedwood fuels represents an increased risk.
- The dwellings of the Cottonwood community do not meet FireSmart standards.
- The storage of hazardous products represents a hazard if ignited. These materials are at risk of ignition and extinguishment may require a large commitment of resources. The burning of these materials may produce poor

air quality and quantities of air borne embers which could ignite other wildland or manmade fuels in the vicinity.

- ⇨ The Fire Department will have limited access to the forested area leading to the current Town boundary.
- ⇨ Storage of aviation fuel and fueling of aircraft.

Photo 3. Cottonwood

Photo 4. Fire Center and Cottonwood

Ignition Potential

Fires caused by human activity are possible throughout the unit. The use of ATVs has the potential to ignite fires. Due to the wildland fuel composition, the risk of these type of ignitions is predominantly in the spring when the grass is cured and readily available for combustion.

There is a risk of ignition from ember production in a wildfire in the adjacent coniferous fuels.

The Cottonwood houses are not separated from each other and the wildland environment. House to house ignition would be probable.

Structure and Site Hazard Assessment

Properties West of Footner Drive

The dwellings and buildings in this unit have asphalt or metal roofs with unsheathed decks. The asphalt roofs are in poor condition. Many of the homes have vinyl siding. Many of the structures have unmanaged grass or mixedwood fuels to 30 meters or more from the building. There are shrubs and low branches in the surrounding forest. There is storage of combustible miscellaneous items. Some of the homes have combustible materials within the Immediate, Intermediate and Extended Zones. The community is served by paved/gravel roads without rural addressing. The Values at Risk are addressed, but without the sign predominately located at the driveway. The roofs and gutters have accumulations of combustible woody debris.

Properties East of Footner Drive

There are several Staff mobile homes, Airport Terminal, hangers, warehouses, Air Tanker Base and Bunkhouse in this area. The structures are typically metal roofs and metal siding situated on gravel pads. There is limited forest vegetation in this area. There is the storage of combustible materials in all priority zones.

The Structure and Site Hazard Assessment for this Unit is Low on the Airport side and Extreme on the Fire Center side.

Photo 5. Roof Debris in Cottonwood

AREA HAZARD ASSESSMENT

Grass fuels are the predominant fuel in this Unit. The remaining fuel load is comprised of Mixedwood. Some of the Mixedwood fuel types have an abundance of coniferous fuels, which may exhibit a higher fire potential than expected. There is a risk to the community from airborne embers from wildfires outside of the Unit.

Natural forest succession will result in increased amounts of coniferous trees in mixedwood stands over time. As aspen and poplar trees die, understory spruce trees will eventually become dominant, increasing the available fuels on the property. These changes in the forest environment should be monitored so that necessary planning modifications may be made in the future.

The Area Hazard Assessment of this Unit is Moderate.

7.2.2 Mitigation

- Decks, porches and balconies less than 2 m above the ground should have the area between the ground and the base of the structure sheathed from the floor level to the ground level with fire resistant material.
- Continue to manage the grass around residential properties, powerlines and roadways. Regularly mow the rights of way, pipelines and open spaces which are frequented by people.
- Conduct aggressive public education campaigns aimed at the importance of having a FireSmart homes. Provide information on the safe use of equipment in the wildland environment.
- Continue with the Fire Permit system.

- Remove all combustibles from the Immediate Zone.
- Manage vegetation and the storage of combustibles in the Intermediate and Extended Zones.
- Install Rural Address signs at each property. Install a key map sign at the entrance to Cottonwood detailing the house numbers of each dwelling.
- Conduct FireSmart Advanced Home Assessments in Cottonwood.
- Consider a FireSmart Fuel Management program in Cottonwood and around the Fire Center.

7.2.3 SUMMARY

The greatest wildfire threat to Airport Unit will occur in the spring of each year during the cured grass stage.

The largest number of wildfires will occur during the spring fire season when the grass is dry and the deciduous trees are leafless.

Grass fuels are the predominant fuel in this Unit. The remaining fuel load is comprised of Mixedwood. Some of the Mixedwood fuel types have an abundance of coniferous fuels, which may exhibit a higher fire potential than expected. There is a risk to the community from airborne embers from wildfires outside of the Unit.

The Structure Site and Area Assessments resulted in the following:

Table 5. Unit Hazard Assessment

Unit	Structure and Site Assessment	Area Assessment
Airport	Low-Extreme	Moderate

The overall wildfire risk to residential properties in the Airport Unit can be described as Extreme.

The lands with residential properties are Crown property. There is opportunity to conduct FireSmart vegetation management in these areas.

It is important for Town of High Level and the Forestry Division to focus effort and resources to expand their education programs throughout the area.

7.3 Unit 2 Hospital/Residential

Unit 2 is an area primarily of residential dwellings located on the north side of the Town between Highways 35 and 58. The Unit also includes the Water Treatment Plant, Ball Diamonds and the Hospital/Clinic. The dwellings are manufactured or stick built on-site construction. There are two areas which are scheduled for housing development. There are municipal fire hydrants in the community.

The Unit contains grass, aspen and mixedwood fuels. The coniferous content of the mixedwood stands will exhibit extreme fire spread during high fire hazard. There has been a substantial investment in vegetation management which has lowered the wildfire hazard.

During wildfire HWF-042-19, a dozer guard was constructed by the Wildfire Management Branch around the northwest part of High Level between Highway 58 and Highway 35. The guard is 3.5 kilometers long, between 22 and 30 meters wide and covers approximately 10 hectares.

The Unit is contained within the Town of High Level where the municipality has the responsibility for wildfires. The Forestry Division has wildfire responsibility outside of the Town. The Fire Service has good access to all residential areas within Unit 2. Response to the forested areas of the unit would be dependent on access, resources and fire behaviour. The response time for the Fire Service would be within 10 minutes.

STAKEHOLDERS

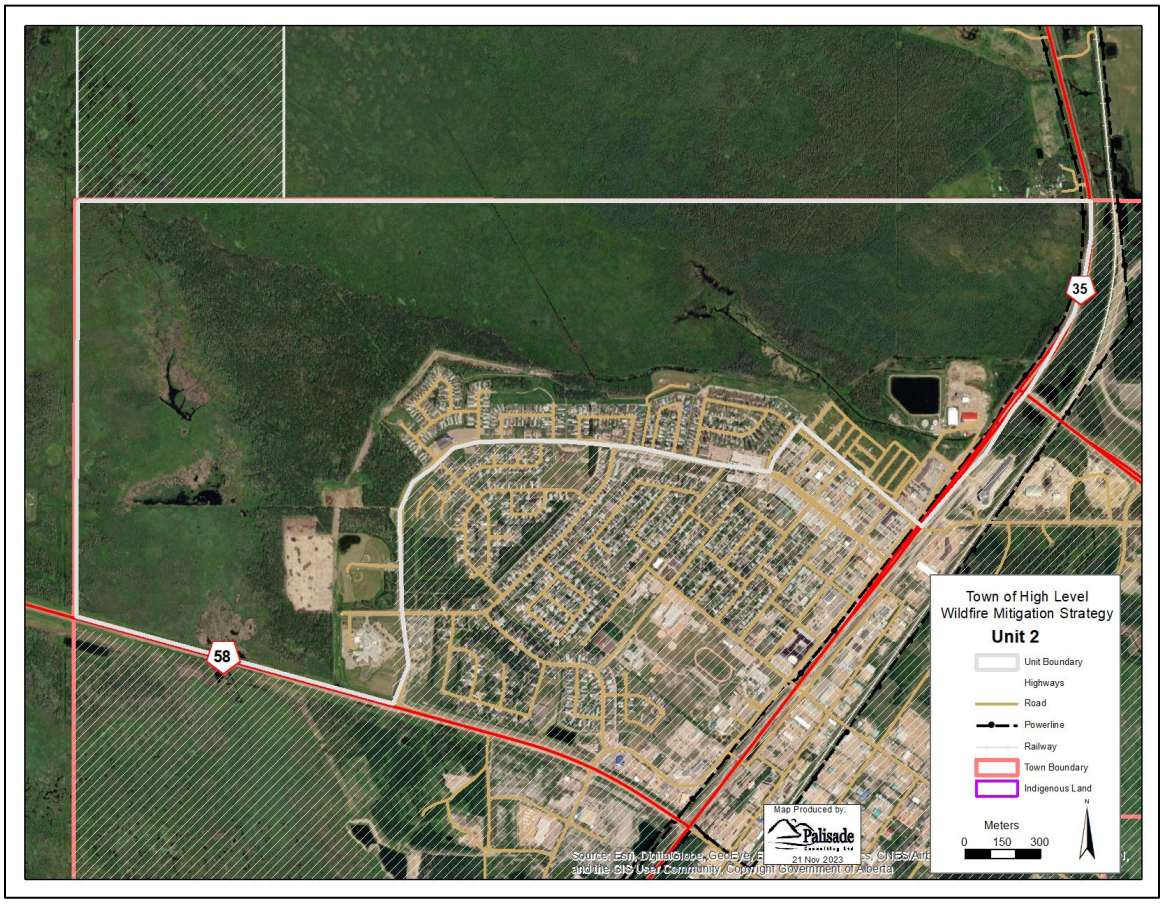
The lands within the Unit are located in the Town of High Level. The majority of the lands are private deeded properties. There are lands owned by the Town for municipal purposes or reserves. A considerable area has been designated for future residential development.

The Town has developed a paved walking trail around the north part of the Unit. The trail is located on and adjacent to the Fire Guard.

There are numerous roads and trails in the Unit which can have a positive impact on wildfire suppression. The linear disturbances provide access to remote areas, provide anchor points for ground and air operations and may provide barriers to fire spread if widened and maintained. Of particular note is the High Level Fire Guard which provides protection to the entire Unit.

Atco provides electrical services to the Unit which is served by underground line.

The primary access roads to the Unit are Highways 35 and 58 and 100th Avenue. The roads provide significant fuel breaks throughout the area and can serve as fire containment lines. There are multiple all-weather gravel and paved roads throughout the Unit.



Map 13 Overview of Unit 2

Photo 6. Overview of Wildland-urban Interface

Photo 7. Typical Dwelling

7.3.1 Hazards

- The area is used by a wide variety of recreational users and the use of ATVs is common.
- The grass fuel types along the roadways, powerlines and pipelines have the potential to quickly spread to the residential dwellings. Generally, these rights of way are well-managed grass.
- In the spring, in its natural state, the High Level Fire Guard will support a continuous flammable wick of fuel on the perimeter of the community.
- On the majority of properties, there is storage of combustible materials in the Immediate Zone and 1.
- The coniferous fuels between the Fire Guard and the community located north of 99 Avenue represent an increased risk. A wildfire in the coniferous fuels have the possibility of producing burning embers if ignited. A fire in these fuels will directly impact residences and the availability of access roads.
- The Reserve lands held by the Town has unmanaged fuels. Although it has recently been cleared, the grass vegetation will become established in the spring of 2024.
- There is large area of aspen fuels generally to the north of Dragonfly Crescent on the north side of the Fire Guard. The area is heavily used for recreation. There are several areas of coniferous or mixedwood fuels.

Photo 8. High Level Fire Guard Vegetation

Photo 9. Mixedwood Fuels north of 99 Avenue

IGNITION POTENTIAL

Fires caused by human activity are possible throughout the unit. The use of ATVs has the potential to ignite fires. Due to the wildland fuel composition, the risk of these type of ignitions is predominantly in the spring when the grass is cured and readily available for combustion.

There is a risk of ignition from ember production in a wildfire in the coniferous fuels.

The houses are generally separated the wildland environment by alley, trail or Fire Guard. There is a potential of fire spread from the wildland areas to structures. Given the urban sized separation between houses, house to house ignition would be possible.

Structure and Site Hazard Assessment

The dwellings in this unit have asphalt or metal roofs with sheathed and unsheathed decks. Houses with decks over 6 feet above the ground do not require sheathing. Many of the homes have vinyl siding. Most of the structures have manicured grass or managed deciduous trees to 30 meters or more from the building. There is minimal storage of combustibles such as firewood and miscellaneous items. Some of the homes have combustible materials within the Immediate, Intermediate and Extended Zones. The community is served by paved roads which are signed. Each of the dwellings is addressed, with the sign prominently on the structure.

The hospital is well separated from the wildland environment by manicured grass, paved road and the Fire Guard.

The Structure and Site Hazard Assessment for this Unit is Low.

Area Hazard Assessment

The Unit contains grass, aspen and mixedwood fuels. The coniferous content of the mixedwood stands will exhibit extreme fire spread during high fire hazard.

The fuels adjacent to residences are primarily manicured grass, ornamental aspen and non-vegetated fuel (road, alley, trail).

The Area Hazard Assessment of this Unit is Low.

Photo 10. Mixedwood Fuels

7.3.2 Mitigation

- Decks, porches and balconies less than 2 m above the ground should have the area between the ground and the base of the structure sheathed from the floor level to the ground level with fire resistant material.
- Continue to manage the grass around residential properties, powerlines and roadways. Regularly mow the rights of way, pipelines and open spaces which are frequented by people.
- Develop a vegetation maintenance program for the Fire Guard and vacant Town subdivisions.

- For the residences adjacent to the wildland, conduct a public education campaign aimed at the importance of having a FireSmart homes.
- Consider fire prevention activities in the forested recreational area to the north of Dragonfly.
- Remove all combustibles from the Immediate Zone.
- Manage vegetation and the storage of combustibles in the Intermediate and Extended Zones.
- Consider a Firesmart fuel management plan for the coniferous fuels between the Fire Guard and the community located north of 99 Avenue south of the Fire Guard and the forested area to the north of Dragonfly.

7.3.3 SUMMARY

The greatest wildfire threat to the Hospital/Residential Area will occur in the spring of each year during the cured grass stage.

The largest number of wildfires will occur during the spring fire season when the grass is dry and the deciduous trees are leafless.

The Unit contains grass, aspen and mixedwood fuels. The coniferous content of the Mixedwood stands will exhibit extreme fire spread during high fire hazard. The Town should consider a Firesmart Fuel Management Plan for the identified hazard fuels. The High Level Fire Guard would benefit by a Vegetation Maintenance Program.

The Structure, Site and Area Assessments resulted in the following:

Table 6. Unit Hazard Assessment

Unit	Structure and Site Assessment	Area Assessment
Hospital/Residential	Low	Low

The overall wildfire risk to residential properties in the Unit can be described as Low. However, the isolated coniferous fuels could generate aggressive fire behaviour that may pose a threat to the community.

The lands with residential properties are deeded private property. There is little opportunity to conduct FireSmart vegetation management in these areas.

The Town of High Level has Municipal Reserve lands and lands scheduled for development. The Town should consider a Vegetation Management Program to limit the growth of grass.

7.4 Unit 3 Rodeo/Light Industrial

The Rodeo/Light Industrial Unit is bounded by Highway 58, 114 Avenue and the municipal boundary with Bushe and Mackenzie County. It includes the Rodeo Grounds, Pioneer, Light Industrial buildings and municipal reserve lands as well as the proposed annexation area around the Waste Water Treatment Plant.

The buildings are manufactured or stick built on site with metal roofs and siding. They are generally located on gravel pads adjacent to 92 Street.

The wildland area of the Unit contains grass, deciduous with pockets of coniferous forest.

The Fire Department has good access to all developed areas within Unit 3. Access to undeveloped forested lands would be dependent on access, resources and fire behaviour.

The realignment of Highway 58 has had a positive reduction in coniferous fuels.

STAKEHOLDERS

The majority of the lands are private deeded properties. Town of High Level has several parcels of Municipal Reserve lands for Parks, municipal purposes and future use.

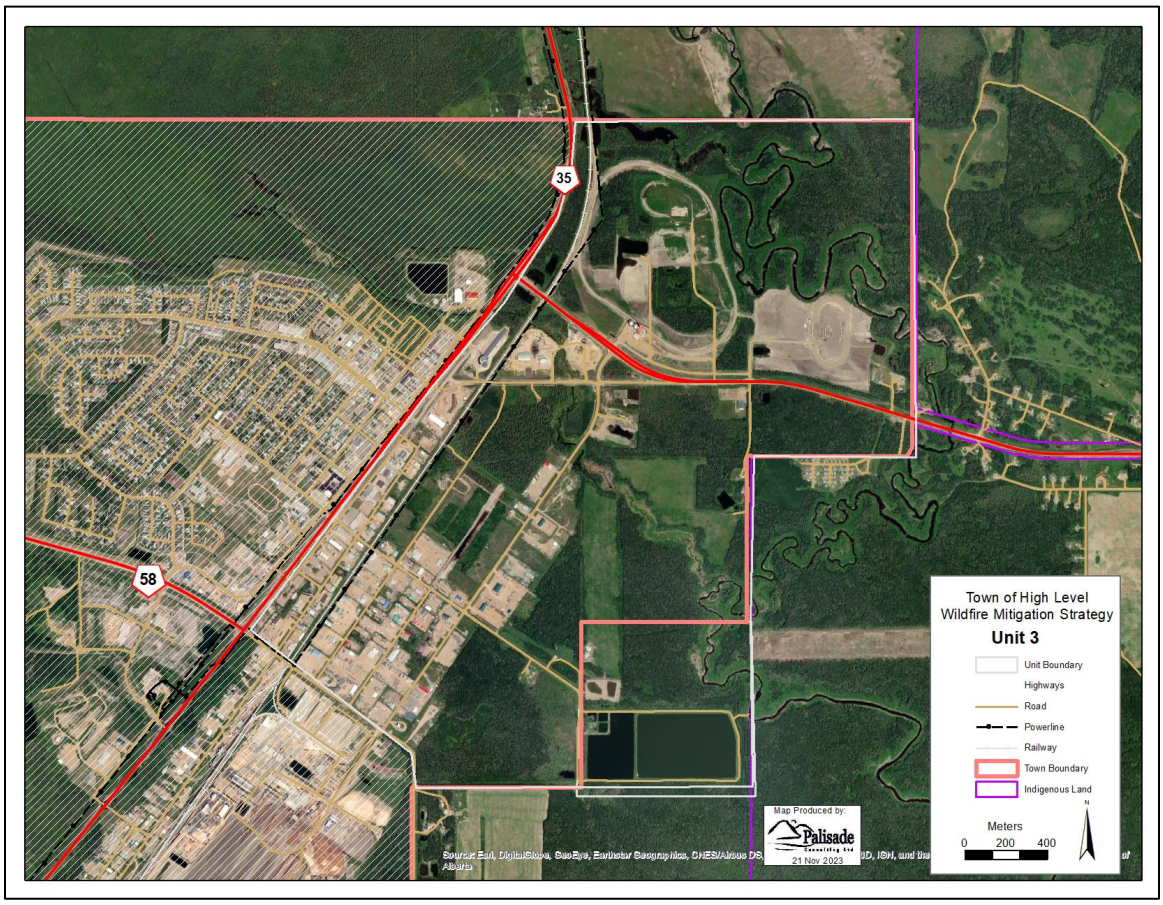
CNR is in possession of lands occupied by the railroad. These lands are not within the jurisdiction of the Town or the Province of Alberta.

Atco provides electrical services to the area. The lines throughout the Unit are generally well maintained.

The primary access roads provide significant fuel breaks throughout the area and can serve as fire containment lines. There are multiple all-weather paved and gravel roads throughout the Unit.

The Unit provides access to the Rodeo Grounds for recreational purposes.

There are several pipelines in the Unit.



Map 14 Overview of Unit 3

Photo 11. Unit 3 Coniferous Fuels

Photo 12. Deciduous Fuels at Annex Lands

Photo 13. Light Industrial and Forest Fuels

7.4.1 Hazards

- The area is used by a wide variety of recreational users and the use of ATVs is common.
- The grass fuel types along the roadways, powerlines and pipelines have the potential to quickly spread to the residential dwellings. Generally, these rights of ways are well managed grass.
- The vacant properties have unmanaged grass fuels.
- There are hazardous materials at several locations. There is a bulk fuel storage facility along 92 Street.
- On several properties, there is storage of combustible materials in the Immediate, Intermediate and Extended Zones.
- The CNR railroad is characterized by unmanaged grass fuels and tie storage.
- The coniferous fuels in the area represent an increased risk. A wildfire in these coniferous fuels will impact the Town as the fire may produce burning embers. Fire Department response to these properties will be governed by access, resources and fire behaviour.
- The storage of consumer and commercial products in the area represents a hazard if ignited.
- There may be a multitude of people at the Rodeo Grounds for special events.
- Transient person utilize the area for temporary shelter.

Photo 14. Ties and Grass Fuels on CNR

Photo 15. Coniferous Fuels

Ignition Potential

Fires caused by human activity are possible throughout the unit. The use of ATVs has the potential to ignite fires. Due to the wildland fuel composition, the risk of these type of ignitions is predominantly in the spring when the grass is cured and readily available for combustion.

There is a potential of ignition from rail operations on the CNR.

Transient persons may have cooking fires or smoking materials which could result in a wildfire.

There is a risk of ignition from ember production in a wildfire in the adjacent coniferous fuels.

Most of the properties are well-separated from each other and the wildland environment. Building to building ignition would not be probable.

Structure and Site Hazard Assessment

The buildings in this unit have asphalt or metal roofs. Some of the buildings have vinyl siding, but the majority are metal sided. Most of the structures have to 30 meters or more from the building. There is storage of miscellaneous items. Some of the properties have combustible materials within the Immediate, Intermediate and Extended Zones. The area is flat with no topographical concerns. The community is served by paved and gravel roads and most roads are looped. Each of the roads and properties is addressed with appropriate signage.

The Structure and Site Hazard Assessment is Low in this Unit.

Photo 16. Buildings on 92 Street

AREA HAZARD ASSESSMENT

The developed areas are primarily located in grass fuels. Grass fuels on the CNR line may provide a wick for fire spread into the community. The surrounding fuels are primarily deciduous forest. The fuels of greatest concern are the coniferous fuels west of 92 street and south of 98 Avenue in the vicinity of the former campground. This area has a substantial coniferous content which borders the community and the CNR with unmanaged fuels. These fuels will exhibit extreme fire spread during high fire hazard. The risk to the urban portion of the community is from airborne embers rather than direct flame impingement. A similar condition exist just to the east adjacent to Highway 58.

The Town has made substantial effort and investment in fuel modification projects in the hazard areas.

The Unit is served by municipal fire hydrants.

The Area Hazard Assessment of this Unit is Low.

7.4.2 Mitigation

- Continue to manage the grass around properties, powerlines and roadways. Regularly mow the rights of way, pipelines and open spaces which are frequented by people.
- Manage the grass fuels on vacant properties and the rodeo grounds.
- Encourage CNR to undertake a fuel management program in the vicinity of the Hamlet. Remove surplus combustible materials such as wooden ties
- Remove all combustibles from Immediate Zone.
- Manage vegetation and the storage of combustibles in Immediate, Intermediate and Extended Zones.
- Conduct a FireSmart fuel management program for municipal lands (identified in the Vegetation Management section of this Strategy).

7.4.3 SUMMARY

The greatest wildfire threat to the Unit will occur in the spring of each year during the cured grass stage.

The largest number of wildfires will occur during the spring fire season when the grass is dry and the deciduous trees are leafless.

The light industrial areas are primarily located in grass fuels. The unmanaged grass fuels of the CNR line may provide a wick for fire into the community. The surrounding forests are primarily deciduous. The fuels of greatest concern are the coniferous forest west of 92 street and south of 98 Avenue in the vicinity of the former campground and an area south of Highway 58. These fuels will exhibit extreme fire spread during high fire hazard. The risk to the urban portion of the community is from airborne embers rather than direct flame impingement.

The Structure, Site and Area Assessments resulted in the following:

Table 7. Unit Hazard Assessment

Unit	Structure and Site Assessment	Area Assessment
Rodeo/Light Industrial	Low	Low

The overall wildfire risk to developed properties in the Unit can be described as Low. The coniferous forests in the Unit could generate aggressive fire behaviour that may pose a threat to through ember ignition.

The lands with developed properties are deeded private property. There is little opportunity to conduct FireSmart vegetation management in these areas. The Town should consider FireSmart fuel management on municipal reserve lands.

7.5 Unit 4 Canadian Tire/Tolko

The Canadian Tire/Tolko Unit is located in the Town of High Level south of Highway 58 (114 Avenue). It is bordered by Mackenzie County. This Unit includes: Commercial Stores, Industrial and the forest products and sawmill at Tolko. The CNR line bisects the Unit with a railyard and spur lines into Tolko. The buildings are both manufactured and stick built on site. There are no residential dwellings in the Unit.

The Fire Department has good access to all structures in the Unit with fire hydrants and access to several ponds for draughting water. Tolko has fire hydrants, a fire engine and an emergency response plan.

The Unit is at risk from wildfire and has experienced wildfire events in the past. The forest environment on the southern perimeter of the unit was burned over by the Chuckegg Fire in 2019. During the fire, substantial effort was expended in the protection of the Town and Tolko from burning embers from the adjacent fire.

Commercial enterprises and industry is the prime focus of Unit. The facilities in the Unit are essential to the economy of High Level.

The wildland area of the Unit contains grass and deciduous fuels. Tolko has large decks of logs and trees as well as waste wood piles.

STAKEHOLDERS

The majority of the lands are private deeded properties. The Town of High Level owns the majority of vacant lands which will be used for municipal purposes and future development.

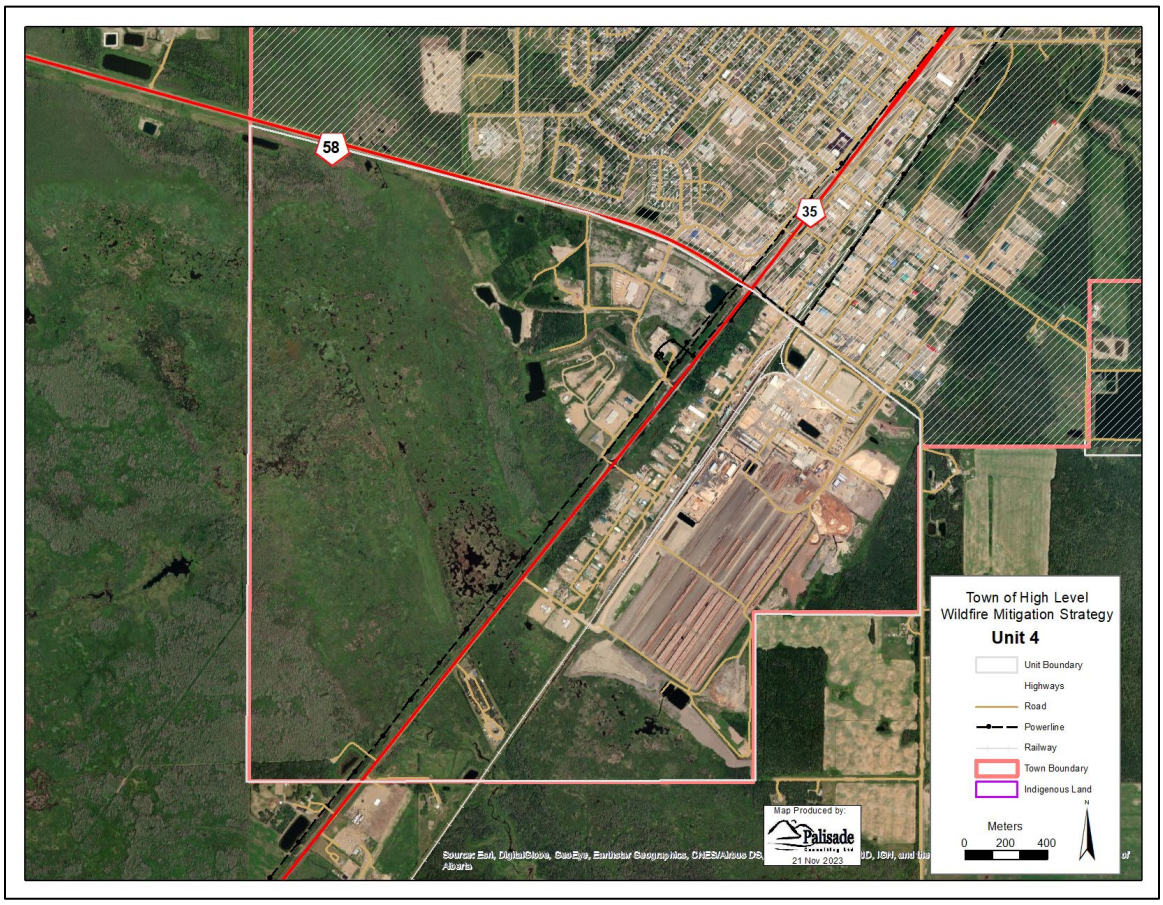
There are roads and trails in the Unit which can have a positive impact on wildfire suppression. The linear disturbances provide anchor points for ground and air operations and may provide barriers to fire spread if widened and maintained.

Atco provides electrical services to High Level. The lines throughout the Town are generally well maintained.

The primary access roads to the Unit are Highways 58 and 35. These roads provide significant fuel breaks throughout the area and can serve as fire containment lines. There are multiple all-weather paved and gravel roads throughout the Planning Area.

Tolko Industries Ltd owns and operates the sawmill located within the Town of High Level adjacent to Highway 35 and the Canadian National Railroad. They maintain a reservoir and pump system as well as 10 hydrants for firefighting purposes at their facility. Tolko High Level is ranked in the top five largest lumber producers in Western Canada, with an output of more than 450 million board feet per year, and capacity for more. The product is 100% Spruce dimensional lumber, sourced primarily from within the region. Tolko exports the majority of the mill's output to Japan and China, with North America picking up the remainder

CNR is in possession of lands occupied by the railroad. These lands are not within the jurisdiction of the Town or the Province of Alberta.



Map 15 Overview of Unit 4

Photo 17. CNR/Industrial/Tolko

Photo 18. Log Decks, Waste Piles, Sawmill and Forest Products

Photo 19. Forest Products for Shipping

7.5.1 Hazards

- The area is used by a wide variety of recreational users and the use of ATVs is common.
- The grass fuel types along the roadways, powerlines and pipelines have the potential to quickly spread to the structures. Generally, these rights of ways are well managed grass.
- On the majority of properties, there is storage of combustible materials in Immediate, Intermediate and Extended Zones.
- The municipal lands to the west are comprised of unmanaged grass fuels that are adjacent to the wildland.
- The grass fuel types have the potential to quickly spread to the residential dwellings.
- The storage of raw and manufactured forest products represents a hazard if ignited. These materials are at risk of ignition and extinguishment may require a large commitment of resources. The burning of these materials may produce quantities of air borne embers which could ignite other wildland or manmade

fuels in the vicinity. There are substantial accumulations of sawdust and waste wooden materials.

- The CNR line provides a wick of unmanaged grass fuel leading through the length of the community.
- The commercial and industrial properties have a wide range of hazardous materials from consumer products to bulk fuel and propane. The CNR transports a full spectrum of dangerous goods by rail.
- Access to the east side of the train tracks has the possibility of closure caused by CNR operations.
- The access to Town fire hydrants for a log deck fire must cross the CNR line.
- A seed mill beside the CNR has been closed and abandoned.

Photo 20. Typical Commercial Building

Photo 21. Bulk Fuel and Railyard

Ignition Potential

Fires caused by human activity are possible throughout the unit. The use of ATVs and carelessness have the potential to ignite fires. Due to the wildland fuel composition, the risk of these type of ignitions is predominantly in the spring when the grass is cured and readily available for combustion.

Tolko has a comprehensive Log Yard Fire Response Plan.

There is a risk of ignition from ember production in a wildfire in the adjacent coniferous fuels.

Operations at the sawmill and CNR line have a high risk of fire ignition.

Structure and Site Hazard Assessment

The structures in this unit have metal roofs and metal siding. The structures are primarily located on gravel or paved areas. There is combustible materials throughout the Tolko operations. Most of the other properties have varied accumulations of materials in the Immediate, Intermediate and Extended Zones. The powerline is tree free above ground or is located underground. There are no structures within 30 meters of the wildland. Most are in areas of manicured grass, gravel or pavement. The area is flat with no topographical concerns. The community is served by paved and gravel roads. Each of the properties is addressed, with the sign predominately located on the building.

The Structure and Site Hazard Assessment is Low.

Photo 22. Industrial, Powerlines, CNR, Hydrant

Area Hazard Assessment

The fuels in the area are primarily grass on cleared lands or in the fuels consumed by the Chuckegg Fire. There are isolated areas of deciduous fuels on the east side of Tolko. There are agricultural lands to the east of Tolko, which are considered as non-vegetated. The log decks and wood waste accumulations at Tolko are at risk of ignition from burning embers throughout the fire season.

The Area Hazard Assessment of this Unit is Low.

7.5.2 Mitigation

- Continue to manage the grass around properties, powerlines and roadways. Regularly mow the rights of way, pipelines and open spaces which are frequented by people.
- Land owners should remove all combustibles from Immediate Zone.
- Encourage CNR to manage the grass fuels within the rail right of way.
- Maintain cooperative emergency response planning with all stakeholders, particularly Petro Canada and Tolko. Continue with fire prevention activities in the high risk areas.

7.5.3 SUMMARY

The greatest wildfire threat to the Canadian Tire/Tolko will occur in the spring of each year during the cured grass stage.

The largest number of wildfires will occur during the spring fire season when the grass is dry and the deciduous trees are leafless. Tolko may be a risk throughout the fire season from burning areas in adjacent lands.

The wildland area of the Unit is comprised of grass and deciduous fuels. Tolko has large decks of logs and trees as well as waste wood piles.

The Structure/ Site and Area Assessments resulted in the following:

Table 8. Unit Hazard Assessment

Unit	Structure and Site Assessment	Area Assessment
Canadian Tire/Tolko	Low	Low

The overall wildfire risk to properties in the Unit can be described as Low. The properties are well separated from the wildland environment

The developed lands are deeded private property. There is little opportunity to conduct FireSmart vegetation management in these areas. Consideration should be given to fuel management on municipal lands.

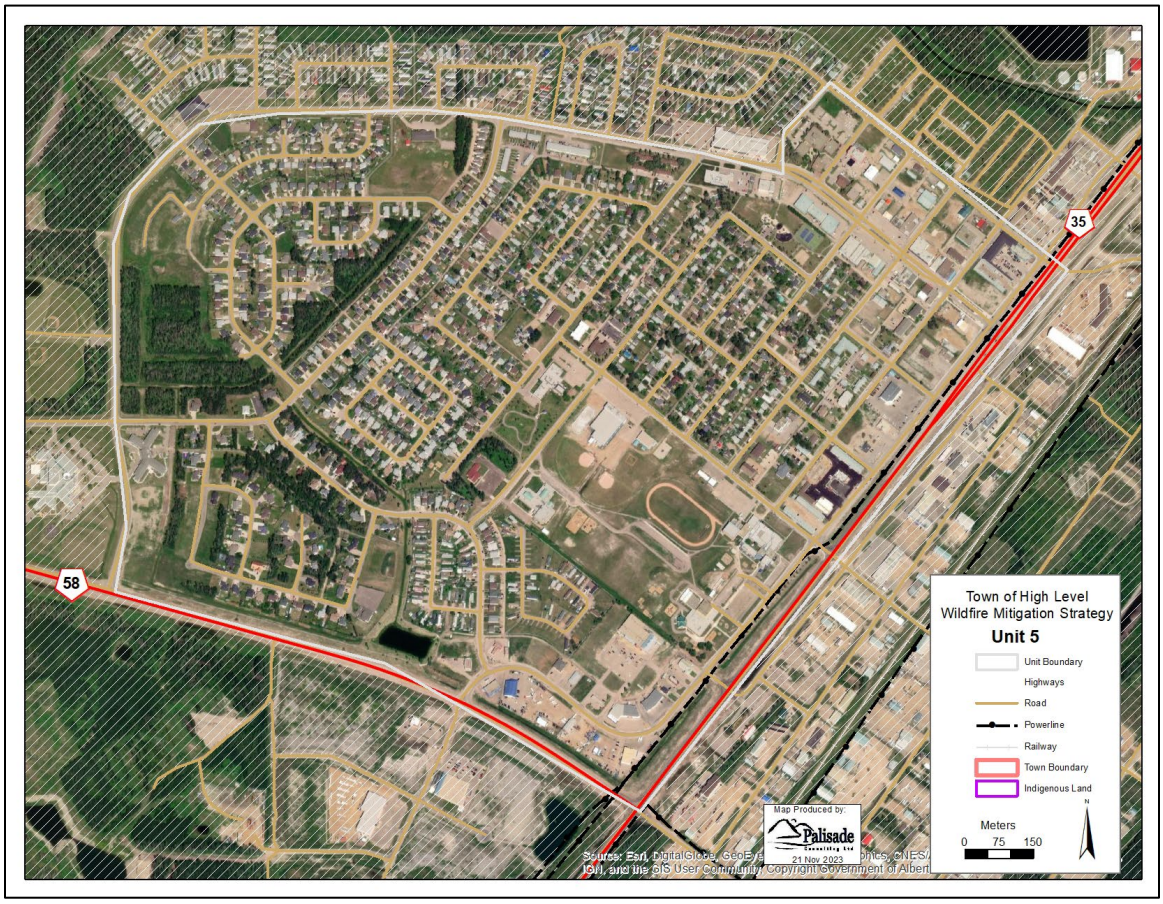
7.6 Unit 5 Urban High Level

Unit 5 is located in the central core of the Town of High Level. It has residential occupancies, commercial, recreational facilities, schools, municipal buildings, hotels and infrastructure consistent with a progressive community.

High occupancy buildings would include schools, hotels, arena and senior citizens' lodge.

The wildland area of the Unit is comprised of isolated deciduous fuels in the residential area. The treed area of the community is an important part of the community lifestyle.

The Fire Department has good access to all areas within Unit 5.



Map 16 Overview of Unit 5

STAKEHOLDERS

The majority of the lands are private deeded properties. The Town of High Level has several parcels of land for municipal purposes. The Province of Alberta is in possession of lands for education and administration purposes.

Atco provides electrical services to High Level. The lines throughout the Unit are generally well maintained.

Highways 35 and 58 are the prime access routes for the community. These roads provide significant fuel breaks throughout the area and can serve as fire containment lines. There are multiple all-weather paved and gravel roads throughout the Planning Area. There are several water drainage ditches in the northern residential area.

Photo 23. Deciduous fuels in Urban Unit

Photo 24. Deciduous Fuels and Drainage

7.6.1 Hazards

- The area is used by a wide variety of recreational users.
- BBQ propane tanks and outside fire pits are common.
- The grass fuel types along the roadways, powerlines and pipelines have the potential to quickly spread to the residential dwellings. Generally, these rights of way are well managed grass.
- On many residential properties, there is storage of combustible materials in the Immediate zone

Photo 25. Firesmart Home

Photo 26. Commercial Core

Ignition Potential

Fires caused by human activity are possible throughout the unit. Due to the wildland fuel composition, the risk of these type of ignitions is predominantly in the spring when the grass is cured and readily available for combustion.

Outside fire pits may result in unintended fires.

The houses are situated in a typical urban environment with a minimum clearance between structures. Those dwellings in the Town have an increased susceptibility to house-to-house ignition.

Structure and Site Hazard Assessment

The dwellings in this unit have asphalt or metal roofs with open decks. Many of the homes have vinyl siding. Most of the structures have manicured grass or managed deciduous trees to 30 meters or more from the building. There is minimal storage of combustibles such as firewood and miscellaneous items. Some of the homes have combustible materials within Immediate and Intermediate Zones. Topography will have no impact on fire spread. The community is served by

paved roads and the community roads are looped. Each of the dwellings is addressed, with the sign prominently located on the structures.

The Structure and Site Hazard Assessment is Low.

Photo 27. Residence adjacent to Deciduous

AREA HAZARD ASSESSMENT

Grass and vegetated non-fuel lands occupy the majority of the area. The forest fuels are dominated by Aspen. There are some areas of dead and down fuels within the deciduous areas.

The majority of structures are well separated from the forest environment.

The Area Hazard Assessment of this Unit is Low.

7.6.2 Mitigation

- Decks, porches and balconies less than 2m above the ground should have the area between the ground and the base of the structure sheathed from the floor level to the ground level with fire resistant material.
- Continue to manage the grass around residential properties, powerlines and roadways. Regularly mow the rights of way, pipelines and open spaces which are frequented by people.
- Conduct public education campaigns aimed at the importance of having a FireSmart homes.
- Remove all combustibles from Immediate Zone.

7.6.3 SUMMARY

The greatest wildfire threat to the Urban portion of High Level will occur in the spring of each year during the cured grass stage.

The largest number of wildfires will occur during the spring fire season when the grass is dry and the deciduous trees are leafless.

The Structure/ Site and Area Assessments resulted in the following:

Table 9. Unit Hazard Assessment

Unit	Structure and Site Assessment	Area Assessment
Urban	Low	Low

The overall wildfire risk to residential properties in the Unit can be described as Low.

The lands with residential and commercial properties are deeded private property. There is little opportunity to conduct FireSmart vegetation management in these areas. Municipal lands should be maintained to FireSmart standards.

Structure and Site Assessment and Area Assessment Summary

Table 10. Structure & Site and Area Hazard Assessment Summary

Unit	Structure and Site Assessment	Area Assessment
Airport	Low-Extreme	Moderate
Hospital/Residential	Low	Low
Rodeo/Light Industrial	Low	Low
Canadian Tire/Tolko	Low	Low
Urban	Low	Low

8 VEGETATION MANAGEMENT STRATEGIES

The fire behaviour triangle consists of three basic elements; fuels, weather and topography. Topography, although it has a profound effect on fire behaviour, cannot be modified. Weather cannot be modified, however mean weather conditions can be expected and used in the planning process. The only elements within the fire behaviour triangle that can be modified to reduce the wildfire behaviour and wildfire threat are the forest fuels.

To reduce the probability of large catastrophic wildfires on the landscape and the threat of wildfire to communities, wildfire vegetation management strategic planning needs to start at the landscape level by identifying potential fuel breaks. Natural fuel breaks can range from less flammable forest vegetation such as large deciduous stands, to breaks in fuels along water courses, to barriers created by barren rocks. Human activities can also cause surface disturbances and create non-fuel areas.

From the landscape level, attention needs to move to where large forest stands of continuous coniferous fuels can combine with prevailing winds and other weather conditions, to pose a high threat to values at risk within the Planning Area. In the Planning Area, the prime objective should be to modify fuels that will aid in containment of approaching wildfires and/or reduce the fire intensity from a crown fire to a surface fire. This can be accomplished by strategically creating fuel breaks with the use of mechanical equipment, or thinning and pruning forest fuels to reduce the intensity of surface and crown fires.

The final line of defense against an approaching wildfire threat to a community will occur at the Wildland-urban Interface, where combustible vegetation meets combustible structures. The primary objective at the Interface is the protection of human life, property and the infrastructure. This is the goal of the High Level Wildfire Mitigation Strategy.

Vegetation management strategies should create a fuel environment that will not support high intensity crown fires. Fire may spread across this area, but it should be of low intensity and more easily contained and extinguished.

In boreal spruce (C2 Fuels) stands, the only effective ways to reduce wildfire intensity and crowning is to either thin and prune the stands or totally remove of the C2 fuels.

Grass fuel management along roads and other linear disturbances can be accomplished by mowing in late summer or early fall. Where it is not feasible to use mechanical equipment, grass fuel loading can be reduced economically with the use of prescribed fire to accomplish the hazard reduction in grass fuels. This should be done in early spring or late fall during the cured grass stages and when local fire danger levels in surrounding forest vegetation will not permit rapid fire spread into coniferous vegetation.

Fuel management plans need to consider reducing fire behaviour potential, reducing fire occurrence risk, protecting values at risk, enhancing suppression capability, and enhancing prescribed burning.

Timber harvesting done at the landscape level to benefit community FireSmart strategies must comply with the current Operating Ground Rules, including guidelines for wildlife protection, riparian buffers and access. Harvest activities must strive to maintain the overall balance of age/cover types on the landscape.

8.1 Vegetation Modification Strategy

The goal of vegetation management is to create a "vegetation-free zone" where flammable vegetation surrounding structures is reduced or eliminated at strategic locations on the community perimeter. The vegetation-free zone is a relatively fuel-free zone from which firefighters can stage their attack to stop structure fires from spreading to the surrounding wildland vegetation or to stop wildland fires from spreading to the structure (Partners in Protection 2003). Vegetation management is often the only option available if development has occurred without prior FireSmart planning. It can also be used in combination with structural and infrastructure options in pre-planning a FireSmart development.

The goal of vegetation management in Town of High Level is to develop potential long-term barriers to fire spread. Through integrated planning, the Town should consider joint FireSmart options with other land use planners which may include utility companies, municipalities, forest industry, First Nations and government, to achieve a reduction in wildfire threat.

Vegetation management consists of any combination of the following three options:

Vegetation Removal - total removal of all flammable vegetation to eliminate the potential ignition of a wildfire.

Vegetation Reduction - partial removal of flammable coniferous forest vegetation to reduce the crown fire potential and lower the wildfire intensity, spread and spotting.

Vegetation Conversion – conversion of the vegetation species from a highly flammable coniferous forest vegetation to a less flammable deciduous forest vegetation.

Vegetation management is required in areas referred to as **Priority Zones**.

Immediate Zone: FireSmart actions here will reduce the chance of wind-blown embers igniting the home. An Immediate area that starts at a structure and extends to a 1.5 metre perimeter around the structure and any attachments, including decks. This zone should have no vegetation or improvements able to sustain a fire. Immediate materials, such as gravel, brick, and concrete, should be used for landscaping features

Intermediate Zone: The Intermediate Zone extends from 1.5 to 10 meters of a structure. Elements in the Intermediate Zone are managed so they don't transmit fire to the home. There are many actions to be taken to reduce the home's vulnerability in the Intermediate Zone. The main objective of vegetation management within this Zone is the creation of a fire-resistance environment. Vegetation removal and conversion are the recommended vegetation management options. The zone should be free of all materials that could easily ignite from a wildfire. Annual grasses should be mowed to a height of not more than 10 cm.

Extended Zone: The goal in the Extended Zone is not to eliminate fire, but to reduce its intensity. This area commences 10 meters from the structure and extends 30 meters outward. The main objective of vegetation management within Zone 2 is to create an environment that will only support wildfires of lower intensity, reduce crown fire potential, reduce the rate of spread and spotting potential. Vegetation reduction and/or vegetation conversion are the recommended options for this Zone.

Vegetation management is aimed at the reduction of fuels immediately adjacent to structures to reduce wildfire intensity and radiant heat near high-risk developments. In general, vegetation management is recommended to reduce wildfire risk to development and vice-versa around all

structures and facilities. **Detailed vegetation management prescriptions should be developed prior to initiating any vegetation management.**

Fuel reduction is the primary vegetation management method based on fuel management goals and the aesthetic needs of the community. Standards proposed for fuels reduction include:

- Overstory and understory thinning to a minimum of three meters between crowns.
- Ladder fuels removed to a minimum of two meters from ground level.
- Removal of all ground fuels accumulations (dead and down woody materials).
- Disposal of woody materials by pile and burn, removal from site or mulching.
- Removal of grass fuels in the spring and fall.

Figure 3. Vegetation Management Priority Zones

The primary wildfire threat to High Level will come from the southeast and north, because of the prevailing winds. During the spring wildfire season, the wildfire threat would be the highest due to the cured grass in open areas and within deciduous fuel types.

8.2 Priorities for Fuel Modification

Priorities for each assessment area are based on the hazard rankings and fuel modification options which will reduce the threat from wildfire to public safety and structures. The proposed fuels modification projects may be further revised based on legal, policy, social, economic, development, or operational-related factors as deemed necessary by the implementing agencies. More than one project may occur simultaneously depending on which agency or landowner is

responsible for the work or the need for new fuel modification areas may arise based on future development in the Planning Area.

The municipality has the responsibility for fuel modification on lands owned by the Town. The Town would proceed with fuel modification projects at the completion of an assessment and detailed prescription followed by appropriate consultations in accordance with Town policy. The Town is not able to legislate FireSmart on private lands, however they can provide professional advice and support to landowners to encourage appropriate actions.

The Forestry Division would be responsible for fuel modification on crown lands.

Homeowners, particularly those in the vicinity of any proposed fuel modification projects should be considered for enhanced public education activities. Deliver a targeted communication program to the residents in the interface areas to encourage a 1.5-meter Immediate zone and a 10-meter fire resistant zone around each structure (Intermediate Zone) and to FireSmart the fuels in the area up to 30 meters (Extended Zone) around each structure.

Wildland-urban Interface assessments were conducted on each of the Units within the Town. These assessments identify both the wildfire risk to the community and establish priorities for mitigation. The assessments were conducted in two forms. In the "Structure and Site Assessment," the structures and the environment within 30 meters of the structures are evaluated. In the "Area Hazard Assessment," the area outside of the 30-meter zone is evaluated. The combination of these two assessments was then utilized to develop and prioritize the mitigation strategy, to collect hazard rating information in a consistent manner, and then quantify the Wildland-urban Interface hazard. The assessments were conducted according to standards established by Partners in Protection Association and the Forestry Division to collect hazard rating information in a consistent manner and then quantify the Wildland-urban Interface hazard. Further information is included in Section 7.11 Assessment portion of this strategy.

"Structure and Site Hazard Assessments" were performed within each Planning Unit of Town of High Level. The assessment evaluates eleven factors within 30 meters of the structure that have the greatest influence on structure survival during a wildfire.

The priorities for fuel modification have been established in accordance with the following formula:

RISK = Average Structure or Site Hazard x Average Area Hazard

Table 11. Fuel Modification Projects Risk Ranking

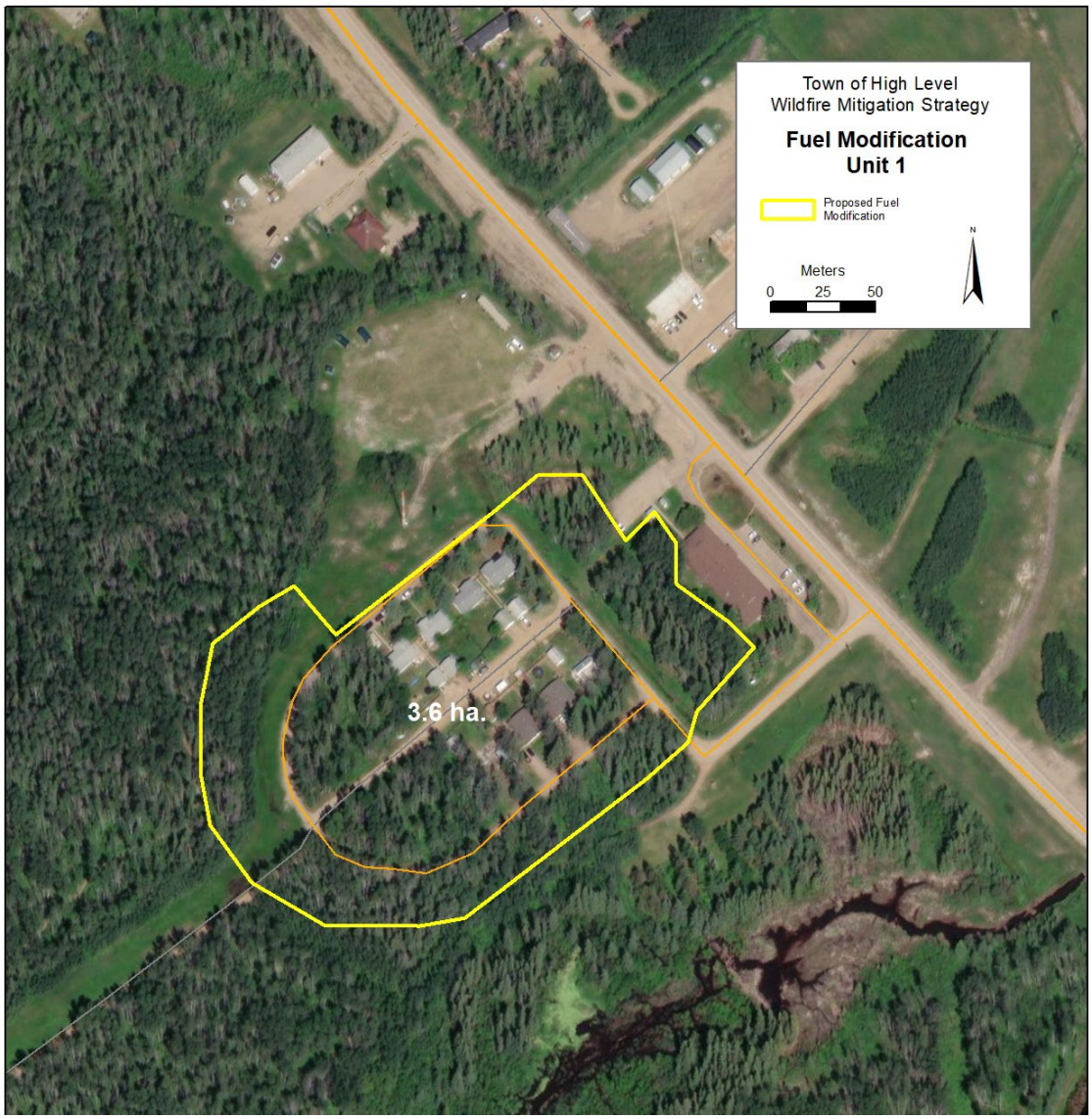
Priority Ranking	Fuel Modification Unit	Average Structure or Site Hazard	Average Area Hazard	Risk Rating
1	Unit 1 Airport	25	60	1500
2	Unit 2 Hospital/Residential	10	10	100
3	Unit 3 Rodeo/Light Industrial	4	15	60
4	Unit 5 Urban	8	2	16
5	Unit 4 Canadian Tire/Tolko	3	5	15

The priorities for fuel modification, based on the hazard assessment, are described below.

UNIT 1 AIRPORT

This Area is located at the High Level Airport. It is a small residential subdivision which is owned and operated by the Government of Alberta. There has been a light fuel modification in the area. The fuels are coniferous C2 which interface with 8 residential dwellings and the High Level Fire Center. There is an accumulation of ladder fuels and dead and down. There is unmanaged grass fuels in the vicinity of the dwellings. The current fuels create a substantial hazard for the dwellings. This full area is 3.6 Ha in size; however, this would be reduced by the road, houses and satisfactory fuels.

A FireSmart Prescription should be developed for this area in order to reduce the hazard. The strategy would be to thin the overstory and understory to a minimum of three meters between crowns. Disposal of woody materials by pile and burn, removal from site or mulching.



Map 17 Fuel Modification Unit 1-Airport

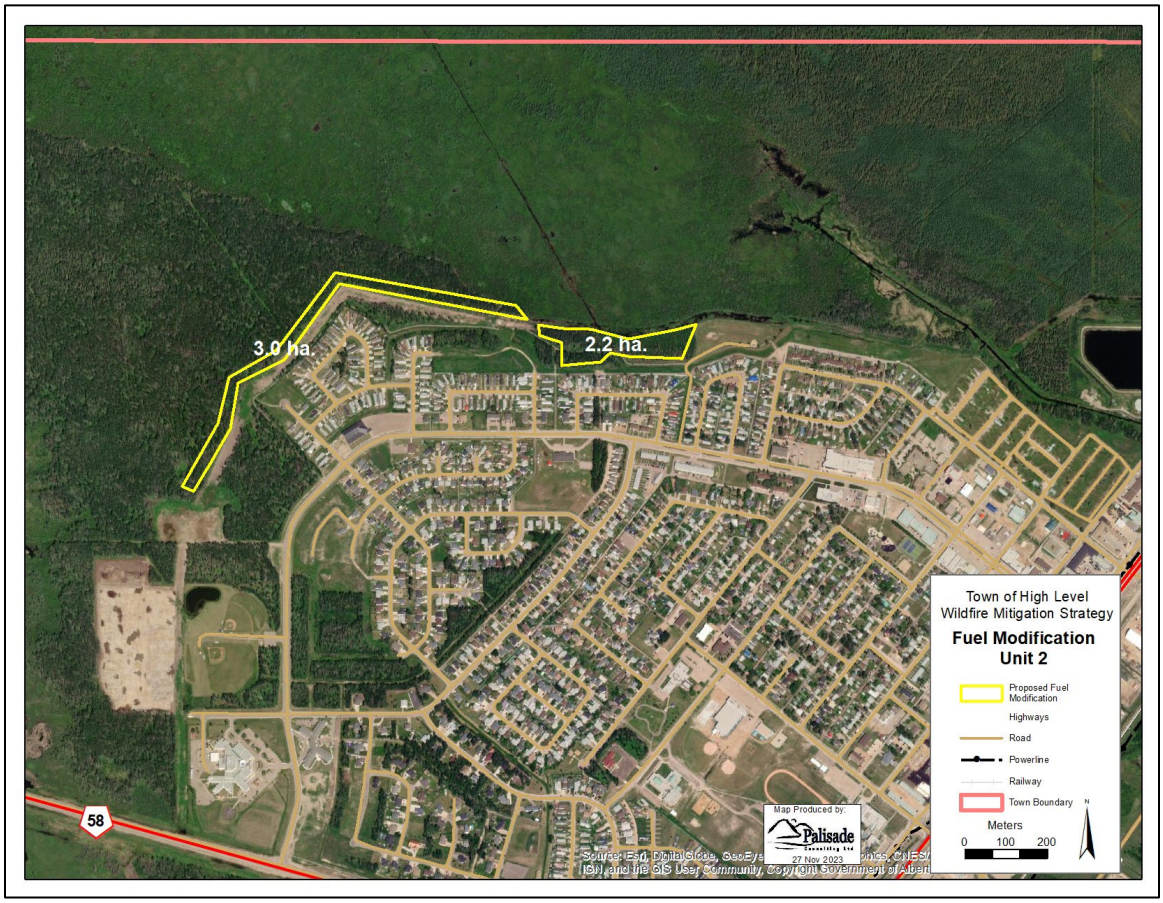
UNIT 2 HOSPITAL RESIDENTIAL

Unit 2 contains two areas which would benefit from a FireSmart prescription to reduce the wildfire risk to the surrounding community. The lands are reserve municipal lands for environmental or municipal purposes. In a wildfire, the coniferous and dead and down fuels have the potential to impact the community.

The area to the north of the alley of 99 Avenue and can be described as mixedwood with moderate dead and down fuels. The area has undergone a light fuel modification in the past. A FireSmart Prescription should be developed for this area in order to reduce the hazard. The strategy would be to thin the overstory and understory to a minimum of three meters between crowns. Disposal of woody materials by pile and burn, removal from site or mulching. This area is 2.2 ha in size.

The area to the north of Dragonfly is a large fuel type of aspen and mixedwood which is heavily used for recreation. In order to enhance the effectiveness of the Fire Guard, the fuels to 20 meters will be modified to a FireSmart standard. FireSmart Prescription should be developed for this area

in order to reduce the hazard. The strategy would be to thin the overstory and understory to a minimum of three meters between crowns. Disposal of woody materials by pile and burn, removal from site or mulching. This area is 3.0 ha in size.



Map 18 Fuel Modification Unit 2 Hospital/Residential

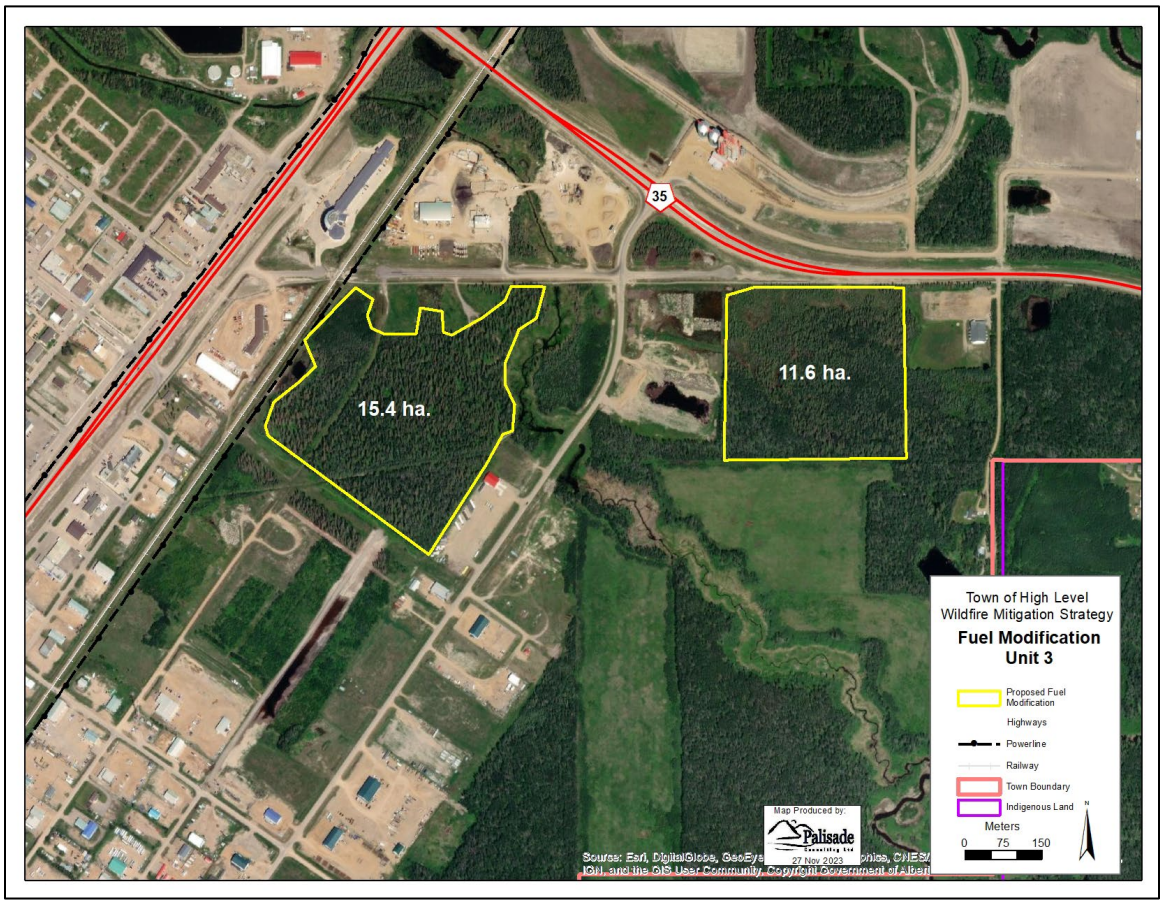
UNIT 3 RODEO/LIGHT INDUSTRIAL

Unit 3 contains two areas which would benefit from a FireSmart prescription to reduce the wildfire risk to the surrounding community. The lands are reserve municipal lands for environmental or municipal purposes.

The fuels of greatest concern are the coniferous fuels west of 92 street and south of 98 Avenue in the vicinity of the former campground. This area has a substantial coniferous content which borders the community and the CNR with unmanaged fuels. This area is 15.4 ha in size. These fuels will exhibit extreme fire spread during high fire hazard. The risk to the urban portion of the community is from airborne embers rather than direct flame impingement. A similar condition exist just to the east adjacent to Highway 58 which is 11.6 ha in size.

The Town has performed light fuel modification of a portion of the area.

In a wildfire, the coniferous and dead and down fuels have the potential to impact the community. A FireSmart Prescription should be developed for this area in order to reduce the hazard. The strategy would be to thin the overstory and understory to a minimum of three meters between crowns. Disposal of woody materials by pile and burn, removal from site or mulching.



Map 19 Fuel Modification Unit 3 Rodeo/Light Industrial

SUMMARY OF FUEL MODIFICATIONS

Each of the Fuel Modification Areas must be assessed and if necessary, a fuel management prescription must be developed by the Town. The areas are summarized below.

Table 12. Fuel Modification Projects by Agency

Unit	Town of High Level
Airport	3.6 ha
Hospital/Residential	5.2 ha
Rodeo/Light Industrial	27.0 ha
Total	35.8ha

ALL UNIT'S GRASS FUEL MODIFICATION

Encourage CN rail to conduct prescribed burning or mowing of the right-of-way on an annual basis. Encourage CN to dispose of piles of woody debris.

Conduct an annual inspection of roadway rights of way, municipal lands and utility rights of way to determine the need for mitigation. The grass hazard is often variable due to weather. Mitigation options include the use of prescribed fire, mechanical equipment for mowing or mulching, and the use of herbicides, which can be effective in controlling the growth of grass and shrubs on these areas.

Implement a Vegetation Management Strategy for the High Level Fire Guard.

Photo 28. Unmanaged Grass Fuels on Fire Guard

8.3 Vegetation Modification Maintenance Strategy

Fuel modification areas are only effective as barriers to fire spread if they are maintained on a regular basis. Fuel reduction projects reduce the canopy density, increasing sunlight to the forest floor and promote growth of residual vegetation. For this reason, periodic inspections and maintenance of fuel modified areas are required to remove accumulating ground and surface fuels, thin dense patches of coniferous regeneration, and remove overstory trees that present further wildfire risk to the development. Inspections are recommended on an annual basis to assess the FireSmart effectiveness of the area for the next 5-year period. Town of High Level will need to budget for these maintenance projects.

To ensure budgets are available for maintenance of the FireSmart projects, plans need to be designed to monitor vegetation re-growth on the sites that are treated. Assessment and monitoring plans should be in place to determine the rate at which vegetation re-establishment is occurring, to maintain the effectiveness of fuel modification projects, and provide long-term protection to communities at minimal cost. The grass fuel loading on linear disturbances that are potential containment lines and hazard reduction prescribed burn sites can contribute to ease of ignition and rapid fire spread within the Planning Area. Annually assess and monitor the re-growth of surface vegetation in areas where thinning or species conversion was completed, to determine the fuel loading of shrub and coniferous growth that can contribute to ladder fuels in the future. More importantly, data need to be collected on the effectiveness of the FireSmart Mitigation Strategies.

Maintenance of the vegetation modification areas as effectively as possible over the long term, will provide the maximum protection to the community. Options include the use of prescribed fire, mechanical equipment for mowing or mulching, and the use of herbicides, which can be effective in controlling the growth of grass and shrubs on linear disturbances.

The High Level Fire Guard was constructed in 2019 in response to the Chuckegg Creek wildfire. The future effectiveness of the guard will be determined by the maintenance of the fuel free barrier. If the guard is permitted to revegetate, it may pose a risk to the Town in the event of a future wildfire.

FireSmart Action List - Vegetation Management

1. Develop detailed plans for fuel modification projects. Consult with stakeholders as part of plan development.
2. Complete fuel modification projects and maintenance as funds, manpower, and resources become available.
3. Commence fuel modification projects, based on recommended priorities as outlined in the implementation plan.
4. A non-combustible, vegetation-free Immediate Zone must be developed and maintained in all developments. Immediate Zone standards are described by FireSmart Canada with the recommended standards. Public education for residents is paramount to the success of this recommendation.
5. Areas susceptible to grass fires, such as the fire guard, road rights-of-way, industrial clearings, pipelines, and power line rights-of-way, should be evaluated on an annual basis to determine the need for fuel removal by prescribed burning or mechanical means to reduce fuel loading and hazard.
6. Review developed areas and future development areas to ensure that all C2/C3 fuels are removed from Intermediate Zone and sufficient fuel modification is done in the Extended Zone to reduce wildfire threat to structures.

9 LEGISLATIVE STRATEGIES

Residents of the Town of High Level are well aware of the potential effects of wildfire on the community. Experience has shown both scientists and homeowners that the condition of a home as well the vegetation and improvements in close proximity affect the likelihood that a structure will ignite. Local Governments have an opportunity to influence the core elements affecting community vulnerability to wildfires by including wildfire considerations in municipal planning. It is important that FireSmart development practices are considered and implemented from the planning stage through to the completion stage of a development. Many of the factors which influence the susceptibility of property to fire, be controlled or regulated through land use planning.

One action that can be taken to reduce the impacts of future wildfires is to prevent the creation of new risk. A post-disaster analysis of the Fort McMurray wildfire of 2016 found that land use planning and development regulations were being overlooked as critical mitigation tools in Alberta (Kovacs et al., 2019). Planning should consider wildfire hazards at multiple scales; community, neighbourhood and lot.

9.1 Municipal Legislation

Intermunicipal Development Plan

An Intermunicipal Collaboration Framework between Mackenzie County and the Town of High Level was approved by the respective Councils in 2020. The framework identifies the services provided by each municipality, which services are best provided on an intermunicipal basis, and how services to be provided on an intermunicipal basis will be delivered and funded. It states that each Municipality will continue to provide planning and development services to their residents independently. However, it recognizes the Intermunicipal Development Plan adopted in 2009.

The Intermunicipal Development Plan (Bylaw 881-09) allows for the creation of an Inter-municipal Planning Commission. The Commission reviews all subdivision and discretionary development permit applications within the IDP area. In the IDP, Mackenzie County and the Town of High Level agree to enter into Regional Service Sharing Agreements for recreation, airport services, potable water and fire service. The areas identified for future annexation by the Town are inconsistent with application currently in progress. Revision of the IDP will be required once the annexation is ratified.

A wildfire risk and hazard assessment should be considered in making land use decisions in the area. The location of new developments in areas of low risk and hazard will require substantially less mitigative measures to protect the public investments.

Recommendation

When the IDP is revised, it should identify areas within the IDP Area as Moderate, High or Extreme wildfire hazard.

Municipal Development Plan

An important and cost-effective step in managing wildland-urban interface fire risk is assessing and quantifying the hazards before development. Effective hazard mitigation can then be applied

throughout the development process. New areas scheduled for development may require additional enhancement, depending on the site and development proposed. A site-specific interface fire hazard assessment will provide an additional tool for the Town to consider when approving development.

Town of High Level and prospective developers should consider wildfire in the development planning and approval process. Hazard assessment maps should be used to determine the risk of wildfire to the new development area, and if a risk is identified, the Town should request a Wildfire Risk Assessment from the developer, prior to development approval. This will ensure that appropriate mitigation options are incorporated into the planning process.

Wildfire Risk Assessments outline the present biophysical features in the development and recommend vegetation management, structural, and infrastructure options necessary to ensure a FireSmart development. The need for vegetation management projects can be reduced if wildfire risk is considered and incorporated into the planning and development process of future developments in the Town.

Town of High Level has a Municipal Development Plan adopted by Bylaw #987-18 in 2018. The Municipal Development Plan (MDP) is a statutory document developed under the authority of the Municipal Government Act that is intended to support well managed, sustainable growth and development in the Town over the next 20 years.

The plan establishes a policy for completion of an Area Structure Plan prior to approval of any new major development and requires that development conforms to the Town of High Level's Engineering Standards.

Recommendation

Consideration should be given to amending the Municipal Development Plan to include a new policy:

> *If the area proposed for development is determined to contain a wildfire risk, a Wildfire Risk Assessment shall be completed by a qualified professional as part of the Area Structure Plan. The risk assessment should also identify effective fire hazard mitigation to reduce the risk of fire to the development and surrounding area.*

Area Structure Plans and Outline Plans

The Municipal Development Plan states the requirement of an Area Structure Plan prior to development and/or subdivision of lands within the Town. In addition to following the Engineering Standards as set by the Town, an Area Structure Plan should include FireSmart provisions and incorporate the most current recommendations from FireSmart Canada.

Community Standards Bylaw

In 2018, the Town of High Level first adopted a Community Standards Bylaw (976-18). The current version (Bylaw 1038-23), among other things, sets standards for managing organic materials on residential and commercial properties. Grass and weeds must be a maximum of 15 centimeters tall and accumulation of organic debris is prohibited. In addition, the storage of firewood and petroleum products is to be separated from residential dwellings. This bylaw also sets standards for ancillary buildings, roofs, chimneys and specifies penalties for contraventions.

The Community Standards Bylaw is an excellent mechanism for implementing and enforcing FireSmart standards outside of the planning and development framework.

Land Use Bylaw

Land use planning helps municipalities foresee land use issues so that potential land use conflicts or incompatibilities may be resolved or minimized. The main purpose of the Land Use Bylaw is to ensure that development is established in an orderly and efficient manner in compliance with other municipal and provincial policies and statutes. Minimizing fire risk is a land use planning issue in communities surrounded by forested areas. Preventive measures can be applied by local government to reduce the risk of damage to property and persons from wildland fires.

The current Town of High Level Land Use Bylaw came into effect in March 2021. The Town has been very proactive by implementing the Community Standards Bylaw and by requiring that all fire pits require a development permit. This ensures that fire pits are properly sited and constructed in a manner that reduces risk to residents and neighbors.

There are two remaining areas that could be considered to community protection:

Building Materials

In a wildfire event, highly combustible building surfaces can become source of fuel. Both the FireSmart Manual, *FireSmart: Protecting Your Community from Wildfire*, (Partners in Protection 2003) and *National Guide for Wildland-Urban Interface Fires* (Bénichou et al 2021) recommend a combination of building design requirements and vegetation management as important considerations for reducing the risk of wildfire damage to buildings in wildland-urban interface areas. Both publications also recommend fire-resistant exteriors on buildings; fire-retardant roofing rated class A, B, or C and exterior siding such as stucco, metal, brick, concrete or heavy timber. Roofs are the most vulnerable exposure on a building in a wildfire event because they catch and contain fire brands. Vinyl siding is not recommended in areas of high wildland fire hazard areas. Section 4.3.4 of the Land Use Bylaw requires that exterior building finishing materials be specified as part of any application for Development Permit.

Recommendation

When approving development permits for new construction or alteration, the Development Authority should specify as a condition of approval that roofing materials on all buildings that roofing material meet a Class A, B or C ULC fire rating and exterior siding such as stucco, metal, brick, concrete or heavy timber be used.

Decks, Porches and Balconies

The open space beneath decks, porches and balconies provides an environment for the collection of combustible materials. In a wildland fire, this space also allows embers and fire to get under the structure and ignite the building. In order to prevent the buildup of flammable material and prevent fire brands from blowing in under the structure it is advisable to enclose these areas. Ideally, skirting should be constructed with flame resistant materials.

Recommendation

Town of High Level should consider revising the Section 5.14 of Land Use Bylaw to add the following Section 5.14.3:

Any DECK less than 2m above the finished grade shall have the area between the ground and the base of the structure sheathed from the floor level to the ground level with fire-resistant material.

9.2 Vegetation Management

One of the prime considerations in reducing wildfire risk in the wildland-urban interface is vegetation management. Vegetation provides the fuel that carries fire from the wildland into structures or from a structure into the wildland. These fuels can be modified or removed to significantly reduce the chance of ignition. Significant modification also provides fire suppression forces the ability to intervene in a wildland-urban interface fire safely and effectively. Fuel modification should be more aggressive in within 10 meters of structures, (Immediate and Zone 1) and is dependent on the type of fuels, the type of structure and the land use designation. It is important that vegetation management to minimize fire risk also consider environmental and aesthetic values of the community.

IMMEDIATE ZONE

In recent years, research has shown that the Immediate zone, 0 to 1.5 meters around a structure, has the greatest impact on risk. In the event of a wildfire, embers can travel great distances and land in combustible materials near a home. Once ignited, fire can spread to the building with devastating consequences.

Recommendation

Town of High Level should consider amending the Land Use Bylaw by adding a new clause to Section 5.7 stating that a 1.5-meter horizontal Immediate surface shall be established and maintained around the perimeter of all occupied buildings.

FireSmart Action List - Legislation

7. Review and revise Municipal planning legislation to:
   - Require a Wildfire Risk Assessment and appropriate vegetation management in hazardous areas
   - Require the use of *FireSmart* exterior building materials and landscaping
   - Require decks to be skirted.
   - Require a fuel free area in the Immediate zone around all new dwellings.

10 DEVELOPMENT STRATEGIES

Large wildfires have occurred annually in North America and Europe for the past few years leading to increased awareness of the potential for wildfire damage and a general acknowledgement that development within the wildland-urban interface is a safety issue. The design and construction of structures, subdivisions, roadways, water supply and utilities within new developments should reflect this reality. Developers and municipal land use planners need to begin to embrace wildfire considerations in the planning and development process.

A post-disaster analysis of the Fort McMurray wildfire of 2016 found that land use planning and development regulations were being overlooked as critical mitigation tools in Alberta (Kovacs et al., 2019). While most newer homes had features that reduced the risk of fire from burning embers, many had landscaping features that were not fire resistant. Trees and bushes close to buildings, wood chips, vinyl or wood panel siding, and wooden decks and fences all increase the possibility of loss.

Mitigating wildfire risk through planning is cost-effective. Canadian studies consistently confirm the value of investing in resilience including the lower risk of fatalities and injury, reduced damage to buildings and infrastructure, diminished future cost of response and recovery, and increased peace of mind (Kovacs et al, 2019).

Infrastructure options include access road design, water supply, utility installation, and location of parks and open spaces. Development options include structural considerations such as siting, construction materials, and additions such as porches, decks and balconies.

10.1 Infrastructure Options

When planning development in an area that has potential for wildfires, it is important that consideration is given to infrastructure options that will minimize the wildfire hazard to people, property and adjacent land. Roads not only provide access for fire fighters and their equipment but also allow for the safe evacuation of the residents. The suppression of fires requires considerable amounts of water from reliable sources. Utility rights-of-way often contain a buildup of grass and other fine fuels that can contribute to fire ignition and rapid spread during spring and fall. Overhead power lines can also be a source of ignition. Parks and open spaces can serve as safety zones and anchor points from which emergency crews can safely suppress a fire. All of these factors must be considered during the planning stage of the development.

Standards for infrastructure in Town of High Level are addressed in the *Municipal Engineering and Construction Standards* (Town of High Level, 2015) which set out minimum allowable levels for improvements to infrastructure, based on engineering principles and practices. They are applied to new developments, setting standards for the design and construction of all infrastructure, including landscaping, associated with new developments.

10.1.1 Access

Access route standards specified in *National Fire Protection Association standard 1141* are the recommended minimum guidelines for all developments in High Level and the adjacent area. Access roads within the Town are generally satisfactory and are addressed within each Unit assessment. Traveled-surface width, gradient, and turn-around radius are adequate for ingress and egress in most areas is satisfactory. Access road design is a combination of loop-road and cul-de-sac design. Loop-road design is strongly recommended in areas with high or extreme site hazard. It is important that all developments at risk to wildfire have an alternate access route in the event that the primary route is blocked during a wildfire. Communities that do not have

alternate access routes for ingress and egress should identify safety zones in these areas should firefighters escape access routes get cut off by wildfire.

10.1.2 Water Supply

Water is one of the most effective fire suppression tools available to firefighters. Fire suppression requires large volumes of water. The Town of High Level is serviced with hydrant water supply for fire suppression and there are also natural water sources from which water can be drafted or pumped. Hydrants are pressured by an electric powered supply system, which may be lost during a wildfire. Backup systems should be considered to provide service with natural gas-powered pumps to pressure the hydrants

All future development within the Town should consider the standards within the National Fire Code - 2019 Alberta Edition and NFPA 1142 (Standard on Water Supplies for Suburban and Rural Fire Fighting).

There are several ponds and creeks within the Planning Area which can be utilized for firefighting purposes. The potential for developing year-round water supplies (such as dry hydrants or improved access to water bodies) in areas without a municipal water system should be considered.

10.1.3 Franchised Utilities

Franchised utilities that can be affected by an interface fire include electrical and gas services. Proper planning and installation of these services can minimize the risk to residents and emergency services personnel.

Overhead power lines can be a source of ignition of interface fires or they can be destroyed during a fire resulting in the loss of power in the area. There are a number of overhead power lines in Town of High Level. It is recommended that the power company initiate an annual hazard tree identification and removal program along all overhead power line rights-of-way within the Town. Power line rights-of-way can also provide a source of fire ignition when grass and other fine fuels are in the cured stage. Proper maintenance of vegetation along the power lines is important to reduce this risk.

Town of High Level is serviced with natural gas for heating and has pipeline rights-of-ways within the Town. These corridors should be mowed and maintained to reduce the potential for fire spreading along them through developed areas.

10.1.4 Parks and Open Spaces

Parks and open spaces should be incorporated into the development at the planning stage to provide a vegetation-free zone for fire safety while providing recreational opportunities for the public. Properly planned open spaces can increase fire safety while enhancing the aesthetic qualities of the development. Examples of open spaces include golf courses, playgrounds, sports fields, parking lots, and municipal reserve lands. They should be a minimum of 30 meters in width and be maintained with short grass or closely trimmed vegetation.

Typical management objectives for park areas adjacent to home sites or subdivisions are to provide optimum recreational opportunities; enhance aesthetics; maintain tree health and vigor; provide barriers for wind, noise, dust, and visual intrusions. Thinning the forest can reduce the fire hazard, as well as sanitize and improve the forest stand by removing trees that are damaged, attacked by insects, infected by disease, or are of poor form or low vigor.

Pruning helps reduce ladder fuels within tree stands, further enhancing wildfire safety. It may also be a good idea from the standpoint of personal safety to prune trees along trails. All debris resulting from thinning or pruning should be removed from the area or burned under appropriate conditions.

It is important that the nature of the area is not compromised by vegetation management in these areas. Homeowners with property abutting parkland as well as frequent users of trails and park amenities will have strong opinions about what should be done on adjacent public land. They must be consulted prior to any management option being considered.

10.2 Structural Options

The Alberta Building Code does not address building standards for areas at high risk from interface fires; however, the National Research Council of Canada has recently published the National Guide for Wildland-Urban Interface Fires (N. Bénichou et al, 2021). The guide was developed by a team of researchers in collaboration with a Technical Committee composed of national and international experts to reduce wildfire threat posed by the natural environment and enhance fire protection provided by structures. It and FireSmart: Protecting your Community from Wildfire, Second Edition (Partners in Protection, 2003) both provide standards that can be used for design of new developments or to retrofit existing structures.

Characteristics that contribute to a structure's ability to withstand wildfire ignition include type of roofing and siding material as well as properly constructed and maintained eaves, vents, and openings. These vulnerable components can serve as a place for fine fuels such as tree needles to collect in crevices along the structures, easily igniting once firebrands land on a dry windy day. These building features can also provide a path for firebrands to enter the interior of the home, e.g., vents and open windows (Manzello et al, 2020). Although many factors contribute to the ability of a structure to withstand wildfire ignition, roofs that catch fire are the main cause of structure loss in wildland-urban interface areas (Partners in Protection, 2003). Airborne firebrands, created by large wildfires, can travel great distances ahead of a fire. Firebrands landing on combustible roofing surfaces, such as untreated wood shakes, will usually ignite the structure. There are several residential structures in the Town with wood shake roofs. Structures with Immediate roofing surfaces, such as clay or concrete tile, fiberglass/asphalt shingle, and metal, have a much lower probability of ignition from airborne firebrands.

After the roof, siding material is the structural component most vulnerable to wildfire. Intense radiant heat, direct flame impingement, and airborne firebrands lodging in and against the structure exterior are a major source of structure ignitions (Partners in Protection ,2003). The fire-resistance characteristics of the siding in addition to the amount of vegetation-free space surrounding the structure will make a difference in whether a structure survives a wildfire. Immediate siding materials such as stucco, metal, brick, cement shingle, concrete, and rock offer high fire resistance and should be used in areas with higher wildfire hazard ratings.

Factors influencing risk of structure ignition include decks and porches, flammable materials adjacent to the structure, and outdoor fire pits. It is more difficult for municipalities to control these incidental developments, but bylaw provisions should be in place to allow the municipality to control them. It is recommended that these items be included in a public education program aimed at educating residents on developing and maintaining FireSmart homes. FireSmart Canada publishes a Home Development Guide that explains options for building construction and maintenance that will reduce susceptibility to wildfire https://firesmartcanada.ca/wp-content/uploads/2022/01/FireSmart_Canada_Home_Development_Guide.pdf

Existing developments within Town of High Level have a combination of FireSmart and non-FireSmart structural and infrastructure components. They vary in terms of development shape, roofing and siding materials. Vinyl, metal, stucco siding and asphalt roofing are the most common materials used in residential structures. Infrastructure, such as emergency access and water supply is adequate within Town. Through public education and awareness, homeowners should be encouraged to consider FireSmart options when completing maintenance or renovations to their property. Alterations requiring a development permit should have FireSmart conditions attached.

FireSmart Action List-Development Strategies

8. Access should be developed in conformance with National Fire Protection Association standard 1141.
9. All future development should consider the standards within the NFPA 1142: Standard on Water Supplies for Suburban and Rural Fire Fighting and the National Fire Code - 2019 Alberta Edition
10. Power shall be underground for all urban applications.
11. The power company should initiate an annual hazard tree identification and removal program along all overhead power line rights-of-way within the Town.
12. Continue to use parks and open spaces as vegetation-free safety zones and incorporate them into the development at the planning phase. Treed park and reserve areas should be considered for vegetation management to reduce the risk of wildfire occurrence and acceleration.

11 EDUCATION AND COMMUNICATION STRATEGIES

Government agencies, local residents, and industrial land users must share a common vision in order to meet the goals and objectives of the Wildfire Mitigation Strategy. The goal of the Strategy is to provide a guide for Town of High Level and the stakeholder group to implement FireSmart initiatives while retaining and/or enhancing the integrity of the forest environment. To that end, the strategies developed to protect the community and infrastructure from wildfire must be presented to stakeholders so that they can understand and support the programs and projects identified in the plan.

Activities to improve wildfire preparedness are part of a larger process of taking responsibility for choosing to live and work in an area that is at risk to wildland fire. The process does not end with creating vegetation free space, improving access, or utilizing fire resistant building materials but includes a variety of ongoing networking activities that create and enhance partnerships. Effective public education is the key to building those partnerships and providing awareness in the wildland-urban interface. Elected officials, community planners, developers, government, industry, and homeowners all need to work together. In order to do so, they need the knowledge to make informed decisions.

Public education is likely the most challenging component of the wildland-urban interface issues. People are usually optimistic that it will never happen in their back yard and believe that if it does happen that the Local Fire Department and the Forestry Division will look after the problem before it impacts them. Fire agencies have done an excellent job of demonstrating their professions to mitigate emergencies and in most cases are successful. However, wildfire conditions may occur that are beyond the capabilities of emergency responders. The public needs to understand that these types of fires would impact them despite the best efforts of fire agencies. This illustrates the need to provide public education aimed at reducing their risk to wildfire and ensuring that their activities do not start a fire. Public education and community involvement are useful tools that can lead homeowners in interface fire risk areas into undertaking their own preventative measures thus negating the need for local government intervention.

The **biggest challenge** will be to assure local residents that vegetation management, particularly thinning and clearing, is necessary to reduce fire risk but can also help to achieve the aesthetic and practical values held by community members relative to the forest. High Level has an advantage in this regard because it is a natural resources Town and forest management should be better understood than in non-resources-based communities. One way to help overcome the reluctance to vegetation management is to have a local resident who is respected and knowledgeable in forest management to become a champion and spokesperson. When planning vegetation management projects, use the completed areas to showcase the before and after that promote the positive aspects of fuel modification.

Residents of High Level live and work in a forested environment that is susceptible to wildfires. All of the residences and facilities are located on private deeded property. Neither the Town of High Level or the Forestry Division have the ability to conduct FireSmart Mitigation tactics on these properties. Local and provincial governments need to work together to improve property owners' awareness of the risk of living with fire and help them take steps to reduce that risk.

During large wildfire events, first responders have limited resources to respond everywhere. Their response may be guided by attending properties with the greatest likelihood of survival from a wildfire. For safety purposes, in some cases, first responders are unable to undertake

suppression action on large uncontrolled wildfires. It is also not tenable for residents to stay in the area to protect their homes.

The solution for the protection of homes from wildfire, lies with the homeowner. The homeowner must be proactive in implementing FireSmart actions on their property. This responsibility rests solely with individual home owners. The goal is to create a FireSmart environment which is not conducive to wildfire impacts on their homes. Homeowners must take advantage of the guiding resources available from the Town of High Level, Forestry Division and FireSmart Alberta. There is a wealth of information at https://firesmartcanada.ca.

11.1 Stakeholder Consultation

Stakeholders must be consulted and informed if implementation of the plan is to be successful. The first step in the consultation process is to identify who the stakeholders are and then develop a communications plan. The stakeholders are:

- **Local Residents -** the people who reside within Town of High Level.
- **Provincial Government Officials -** have a role in the communications and education of all stakeholders in the Province. Provincial government officials include personnel representing a number of jurisdictions, mainly; the Forestry Division, Emergency Management Alberta, Provincial Parks, and the Fish and Wildlife.
- **Municipal Government Officials -** includes representation from elected officials, subdivision and planning authorities and emergency services/fire personnel. Municipal officials must also take a lead role in promoting FireSmart activities in the Town.
- **Forest Products Industry -** must share responsibility for supporting FireSmart strategies on their land base. The forest industry plays a key role in managing vegetation and maintaining a healthy growing stock through planning, harvesting and regeneration of merchantable timber in the region.
- **Oil and Gas Industry -** The FireSmart Committee provides an opportunity to integrate development with government and other industrial users.
- **Utilities Industry –** Atco and Apex.
- **First Nations -** local and neighboring First Nations people utilize the region for traditional hunting and fishing. It is important that they are informed and consulted on land management issues that support FireSmart activities.

11.2 Delivery Format

Public education may be delivered in many formats. Following are some options to consider:

- FireSmart pamphlets can be hand delivered to targeted residents living in the Wildland-urban interface areas. FireSmart Alberta has pamphlets with wildland-urban interface information that would target residents living adjacent to wildland.
- Continue with the utilization of social media. Use FACEBOOK and X to provide information. Continue with information on the Town website.
- Continue to encourage residents to take advantage of the FireSmart Home Assessment Program.
- Have FireSmart materials available at the Town administration offices.
- Town of High Level should post wildland-urban fire information on their web sites with links to other interface and FireSmart sites, such as; FireSmart Alberta and the Forestry Division (see Reference Material below).

- FireSmart messages can be posted in the local newspapers and radio stations to get FireSmart information out to the public.
- The Fire Department and Forestry staff can join forces to complete targeted residential hazard assessments in cooperation with the residents. Local firefighters are known and respected by the public and this type of personal contact is a great opportunity to describe to a homeowner what is needed to have a FireSmart property.
- Provide home assessments with the FireSmart Advanced Home Assessment Program.
- Develop demonstration areas to highlight the benefits of vegetation management.
- Have copies of the *FireSmart: Protecting your Community from Wildfire* Planner available at the library.
- Utilize FireSmart posters in public places and at trailheads.
- Consider forming a FireSmart Committee.
- Recruit a local community leader to become a spokesperson for FireSmart.
- Organize neighborhood work parties to clean up dead and down woody material and have a hot dog roast on the burn piles.
- Utilize FireSmart resources at community events. Book the Forestry Division FireSmart trailer for the event. Have Bertie Beaver attend the event along with Sparky the Fire Dog. Scheduling these events should be discussed by the stakeholders during their annual meeting. Consider the Town of High Level Community Event listing for promotional opportunities.
- Have a FireSmart open house at the Air Tanker Base when the air tankers are on base. Have the local Heli attack crew and their helicopter on site. These are great attractions for people and a great opportunity to get the FireSmart message out.
- Utilize LED signboards at strategic locations for messaging.
- Combine wildland-urban interface fire information with other activities during Fire Prevention Week. Have an open house at the Fire Station with residential and wildland fire safety information. Have the High Level Fire Department do a foam and sprinkler demonstration.
- Be advocates for home wildland sprinkler systems.
- Consult the FireSmart Manual for templates that can be utilized to build an effective public education program.

In addition to these suggestions, it will be the responsibility of the Stakeholder group to develop and implement community-based programs which are in alignment with available funding and resources. The Forestry Division may consider the development of a focused wildfire public education program. This would be consistent with their public education mandate supported by the Wildfire Prevention Section of the Forestry Division. The program would be aimed at addressing the most common causes of wildfire ignition.

11.3 Communications Plan

The development of a Wildfire Mitigation Strategy requires the understanding, cooperation, support, and participation of all stakeholders. Town of High Level and the Forestry Division have a very positive working relationship with all stakeholders in the area, including; Federal and Provincial Government Departments, local industry and business, Aboriginal and Métis Organizations and utility providers. Partnership support and involvement is essential to successfully deliver the programs.

Objective

The objective of the Communications Plan is to deliver clear, consistent, science-based effective information that will educate stakeholders and residents of Town of High Level and assist them to take ownership in the protection of their homes and property from wildfire. Target audiences include:

- Town of High Level: Town Council, Administration and Planners, First Responders
- Residents of Town of High Level
- Local Utilities providers
- Local Media
- Forest and Oil and Gas Industries

The following Communications Delivery Plan framework can be used to develop a communications strategy to deliver information in a consistent and effective manner.

Table 13. Communications Delivery Plan

Goals and Objectives	Target Audience	Expectations	Action Plan	Responsibility
Present the Town of High Level Wildfire Mitigation Strategy and Wildfire Preparedness Guides	*Town Council*	*- Acceptance and support of plan* *- Feed back*	*Presentation of Strategy and Guides to Town of High Level*	*Director of Protective Services* *Palisade Consulting*
	Town Administration & Planners	*- Education and awareness* *- Feed back*	*Presentation of Town of High Level Wildfire Mitigation Strategy*	*Director of Protective Services*
	Residents & local media	*- Provide information and receive feed back* *- Identify areas where improvements could be made* *- Involve media and project future communications*	*- Arrange venue* *- Contact local media* *- Advertise* *- Open house presentation of plan* *- - Advertise when conducting FireSmart activities*	*- Fire Department* *- Town Planning Department* *- Forestry Division*
Inform local area residents and increase awareness of FireSmart program in Town of High Level	*- Town residents* *- Business owners*	*- To create awareness of wildland-urban interface hazard and risk in and around Town of High Level*	*- News release on implementation of Strategy* *- Articles on wildland-urban interface* *- Articles on implementation of vegetation management activities* *- Reporting of local area wildfire hazard ratings*	*- Town of High Level* *- Forestry Division* *- Local print media and Radio* *- High Level web sites*
Provide information and direction to home owners so they may become FireSmart	*Residents at risk from wildfire*	*- Encourage homeowners to accept responsibility and take action to minimize wildfire dangers to their property* *- Provide recommendations for minimizing interface fire hazard*	*- Mail out to all residents and hand deliver in target areas.* *- Encourage a 1.5-meter fuel-free zone around each structure Immediate Zone)* *- Encourage thinning & pruning fuels in the area up to 30 meters around each structure.* *-Utilize FireSmart Canada "FireSmart Begins at Home App"* *-Consider implementing the Home Partners Program Home Inspections*	*- Town of High Level* *- Forestry Division*

FireSmart Action List-Education and Communication

13. Consult with targeted stakeholders to determine specific direction for immediate action. Develop a focused community based public education program.
14. Inform stakeholders about the FireSmart program and where to get further information.
15. Inform stakeholders about strategies they can use to reduce the risk on their property.
16. Continue with the use of social media.

12 INTERAGENCY COOPERATION AND CROSS TRAINING

Due to the complex nature of fires in the wildland-urban interface, a multi-agency response is required for both prevention and wildfire suppression. The roles of the various agencies involved in the planning for, engineering of, legislation, education and the suppression of interface fires crosses departmental and government boundaries. Since fires do not recognize boundaries, cooperative and coordinated efforts are required. The following illustrates the levels of government agencies responsible for the various issues involved in preventing and suppressing interface fires. There are a multitude of items that lead to effective interagency cooperation. This section will identify some of those items.

Provincial Government **Local Government**

WILDLAND-URBAN INTERFACE

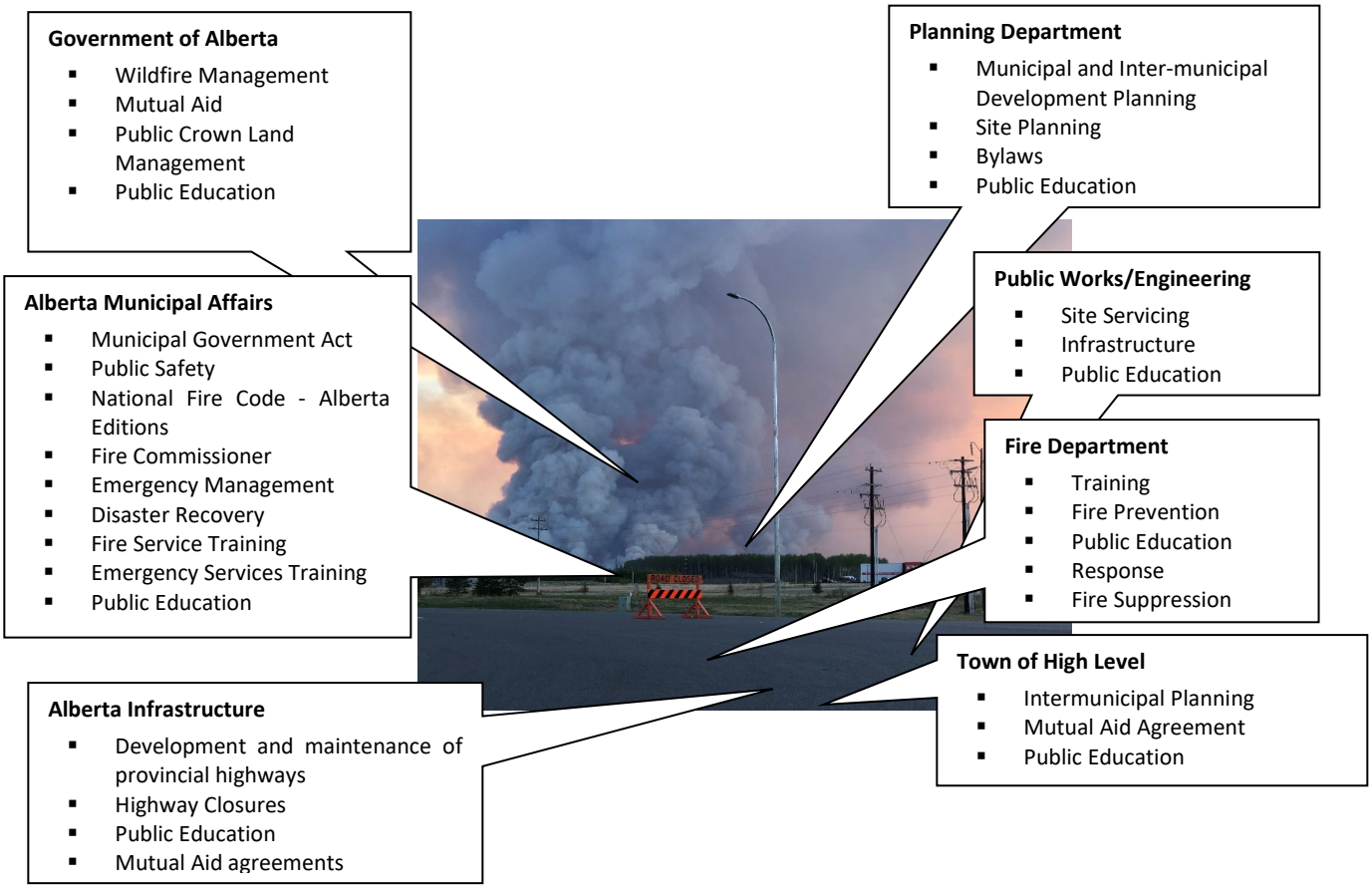


Figure 4. Levels of responsible government agencies.

12.1 Communications

Communications are essential to any relationship. The High Level Fire and Rescue Service and the Forestry Division meet on a regular basis to discuss items of mutual interest. During the Fire Season, the communication between the Service and the Division includes the transfer of fire intelligence information. During periods with a head fire intensity rating above Rank 4, the Division provides daily wildfire information including weather and fire weather/behaviour advisories. Wildfire behaviour and occurrence is predictable, allowing response agencies to prepare and preposition equipment and resources. The Fire Service utilizes the Alberta Wildfire App to access information about the current wildfire situation.

In the analysis of many wildland-urban interface incidents, one common denominator is often the lack of effective radio communications between agencies. The Forestry Division and the Fire Department have effective linkages to establish radio communication. These systems are utilized to link the agencies in the event of a joint response. They provide each agency with real time fire intelligence and immediate access to the Incident Commander. Forestry has access to the Fire Department radio frequency for mutual aid incidents.

The Fire Services use the Alberta First Responder Radio System. Responders have indicated that they have good radio coverage throughout the Planning Area. The Fire Service is dispatched by the Grande Prairie. 9-1-1 Center.

12.2 Fire Bans

The Province of Alberta issues Fire Bans within the Forest Protection Area during times of extreme fire hazard to reduce the incidence of wildfires outside of municipal boundaries. The Forestry Division consults with the Town in the event that a Fire Ban is issued for the region around High Level. The site and area hazard assessments in High Level have indicated that fire hazards are likely during the cured grass stage in the spring and fall of the year. In consultation with High Level, the Forestry Division may consider Fire Bans during these critical times. The plan for Fire Bans should be developed and be approved by the appropriate officials and be ready for implementation as required. There are triggers for Fire Bans, both on and off, based on science, not intuition. Templates for enactment and public education (print, radio, television, and signs) are essential. Legal authority is included in the Forest and Prairie Protection Act. The Forestry Division has staff who can provide enforcement of the Fire Ban.

12.3 FireSmart Committee

A FireSmart Committee should be organized and chaired by Town of High Level to guide the implementation of the Wildfire Mitigation Strategy. Membership in the committee could include; Fire Department, Forestry Division, industry, business, and home owner representation. Members of the Committee will be able to provide expert advice and assistance for the implementation of FireSmart initiatives. The Town may also want to consider the expansion of this committee to include members of community groups.

12.4 Cross Training

In order to respond effectively and safely, both Forestry and Fire Department staff must receive an appropriate level of training in the others discipline. The intent of cross training is not to make structural firefighters into wildland firefighters or vice versa. The purpose of cross training is to be able to utilize each other's resources and expertise in non-traditional roles in a cooperative manner. It must be recognized that cross training represents a substantial commitment from volunteer firefighters who must also train for their primary missions. Firefighters are also

encouraged to complete the Incident Command System 100 and 200 training programs. Chief Officers have achieved Incident Command System 400 qualifications.

As part of their ongoing training initiatives, the Fire Department, regional partners, and Forestry have attended the WUI Crew Member course. This course includes size up, initial strategy and action planning, structure triage, structure and site preparation, engine operations and fire stream management, aircraft operations, hand crews, heavy equipment operations, controlled fire operations, and safety. This course has the added advantage of bringing all the mutual aid partners together to enhance interagency cooperation.

Members of the Forestry Division should attend a training evening with the High Level Fire Rescue Service to familiarize themselves with the Departments resources and operations.

The Ministry of Public Safety and Emergency Services and the Ministry of Forestry, Wildlife, Parks, and Tourism has issued the Alberta Wildland-urban Interface Guidelines. Training and qualification standards are provided for each of the WUI program positions to ensure that personnel are trained, experienced, and competent.

Qualification standards are based on:

- Current structural (NFPA) and/or wildland (CIFFC) qualification level.
- Completed training courses.
- Successful experience in the position.

Photo 29. Town of High Level Fire Station

The WUI positions required for an incident are based on the type and level of activation, and the WUI positions are filled based on the individual's qualifications, training, and experience. To be considered for a WUI deployment, personnel must be trained in at least one of the WUIM, WUIB, WUIL, or STPS levels.

WUI Protection Specialist (STPS)

An STPS may be employed in either the Operations Section or Planning Section.

Operations Section - When activated as a Branch Director, Division or Group Supervisor, the STPS helps manage all tactical WUI operations at an incident. This includes direction, coordination, and implementation of WUI resources to meet the objectives of the Incident Action Plan. The WUI Protection Branch Director reports to the Operations Chief, and a WUI Division or Group Supervisor reports to the Branch Director or the Operations Section Chief.

Planning Section - When activated as a Technical Specialist, the STPS coordinates site assessments and determines the resources required to achieve desired strategies and tactics. The STPS Technical

WUI Strike Team or Task Force Leader (WUIL)

A WUIL performs tactical missions on a division or segment of a division and is responsible for directing different kinds and types of multiple resources assigned to them (i.e., engine, ground or sprinkler crews; heavy equipment, water tenders) during the pre-impingement, impingement, and post-impingement phases. This also includes reports on work progress and resource status as well as maintaining work records on assigned personnel. The WUIL may report to the WUI Branch Director, a Division, or a Group Supervisor, depending on the organizational structure of an incident.

WUI Crew Leader (WUIB)

A WUIB is responsible for supervising and performing tactical assignments of a single resource assigned to them (i.e., engine operations and site preparation activities) during the pre-impingement, impingement and post-impingement phases of an incident. This also includes providing reports on work progress and resource status and maintaining work records on assigned apparatus and personnel. The WUIB may report to a WUIL or the WUI Branch Director, a Division, or a Group Supervisor, depending on the organizational structure of an incident.

WUI Crew Member (WUIM)

Responsible for performing tactical assignments during the pre-impingement, impingement and post-impingement phases. They must be proficient in engine operations and site preparation activities (i.e., sprinkler setup, pumps, hose deployment, and triage). The WUIM reports to a WUIB.

The following table represents a training matrix for qualifications of WUI Personnel.

Table 14. Training Matrix

Role - Course Name	Prerequisites	Other
WUI Crew Member **WUIM**	NFPA 1001 Level I NFPA 1051/1140 Level I * S-131 units 3, 4, 10, 12, 13 * Understanding Fire Weather Index System * ICS I-100	Must hold a valid driver's license with the proper class of license for the responding apparatus For the 2023 season, a case-by-case assessment of training and experience will be made
WUI Crew Boss **WUIB** **	Must be a qualified WUIM and have completed the WUIM Experience Tracker NFPA 1001 Level II ICS I-200	For the 2023 season, a case-by-case assessment of training and experience will be made
WUI Strike Team or Task Force Leader **WUIL** **	Must be a qualified WUIB and have completed the WUIB Experience Tracker ** ICS I-300 ICS Task Force Strike Team Leader Certification	For the 2023 season, a case-by-case assessment of training and experience will be made
WUI Structure Protection Specialist (Branch Director, Division or Group Supervisor) **STPS** **	Must be a qualified WUIL and have completed the WUIL Experience Tracker ** ICS I-400 S-490 Advanced Wildland Fire Behaviour	For the 2023 season, a case-by-case assessment of training and experience will be made

All personnel must have current WHMIS, First Aid and CPR.
For the 2023 season, the AFCA S-215 will be considered as having completed the WUIM course
Those fire departments that train to NFPA standards but do not certify to them can present completed Job Performance Requirements signed by a 1041 level II Fire Service Instructor, who is registered with the Province, to a WUI Field Officer as an equivalency.

* Equivalency for NFPA 1051, S-131, and Fire Weather Index System will be considered if an individual has proof of completion of the Alberta Wildfire or Firetack Crew Member course
** Course being developed, prerequisites are subject to change

FireSmart Action List-Interagency Cooperation and Cross Training

17. Continue with the high degree of communications between the High Level Fire Rescue Services and the Forestry Division.
18. Consider fire bans during the spring and fall of the year during the cured grass stage. Continue with fire ban consistency with the Forestry Division.
19. Develop a local FireSmart Committee to review and implement the Wildfire Mitigation Strategy.
20. Continue with the existing cross training regime of ICS, WUI Crew Member, WUI Crew Leader etc. Encourage joint training sessions between the Fire Department and the Forestry Division.

13 EMERGENCY RESPONSE PLANNING

Municipalities must be prepared to respond to major emergencies that may affect their community. Major emergencies are events of such magnitude that the response to them is often beyond the capability of a single organization. These emergencies often result in a multi-organizational multi-jurisdictional effort requiring cooperation and coordination of activities.

The purpose of a municipality is to develop and maintain safe and viable communities. In accordance with the Emergency Management Act, municipalities are responsible for the direction and control of the emergency response.

Town of High Level has enacted a Fire Service Bylaw, under authority of the Municipal Government Act, R.S.A., 2000. The main purpose of the Bylaw is to provide for the establishment of fire protection and emergency services. The Bylaw also provides for medical first response services. The Fire Bylaw outlines the appointment, roles and responsibilities of the Fire Chief, officers and members of the Fire Department. The Bylaw is complete and meets the needs of the community.

Town of High Level has developed the Regional Emergency Management Bylaw to meet the needs of the municipality and its partners Mackenzie County and the Town of Rainbow Lake.

The Chief Administrative Officer of Town of High Level is the Director of Emergency Management. The Director is responsible for preparing and coordinating emergency plans and programs, providing leadership for the Emergency Agency and for coordinating all emergency services and resources used in emergencies. Other Directors of Town of High Level serve as the Deputy Director of Emergency Management.

Photo 30. Chuckegg Creek Fire from High Level

13.1 Community Emergency Management Plan

Town of High Level has a Community Emergency Management Plan which provides a guide to responding to emergencies that affect the community. The plan provides a prompt and coordinated response to emergencies. It does not replace existing procedures used by responders to deal with routine emergencies. First Responders to incidents in the High Level area may include Police, Fire, Ambulance, and the Forestry Division. These responders must assess the situation and then provide recommendations to the Director of Emergency Management to implement the Emergency Plan. The implementation of the Plan may then lead to the Declaration of State of Local Emergency in order to provide the municipality and the responders with the necessary support to mitigate the emergency. The Plan includes a Wildland-urban Interface Fire Response Plan.

13.2 Wildfire Preparedness Guides/Sprinkler Deployment Plan

Town of High Level must be prepared to deal with a wide range of wildland-urban interface fire scenarios. A fire may approach the residential areas from some distance, providing the Town the opportunity to prepare well in advance of the fire's impact on the community. Another scenario for interface fires are those which start in close proximity to the community and are fast moving, wind driven destructive events which demand immediate response. Interface fires may be short duration events or long duration events which require vast commitments of resources to mitigate.

Wildfire Preparedness Guides are a valuable tool to meet the challenges of an interface fire. The purpose of the Guide is to identify the values-at-risk, the fire behaviour conditions, available resources and strategies to assist emergency response agencies to minimize losses in the wildland-urban interface from a wildfire threat. Town of High Level has implemented a guide for the Town.

Structure protection in the Wildland-urban Interface involves the use of many different strategies and tactics with the overall goal of protecting the greatest number of structures with the resources and time available. Wildfire agencies in Canada have successfully used sprinkler systems for structure protection during Wildland-urban Interface fires.

Sprinkler deployment during fire incidents will provide protection to communities threatened by an approaching wildfire. Sprinklers are typically utilized using landscape and/or community-based deployment. Landscape deployment refers to the installation of a sprinkler line to reinforce existing barriers to fire spread before the fire affects structures. Community based deployment of sprinklers involves the installation of sprinklers directly on or in the immediate vicinity of threatened structures. A Sprinkler Deployment Plan has been developed (and implemented) for the Town.

13.3 Exercises

Municipalities cannot plan for wildland-urban interface incidents in isolation. All agencies must train and plan in a cooperative effort. Exercises are opportunities to identify the strengths and challenges of Emergency Plans and Emergency Organizations. Exercises should be preceded by appropriate training. Exercises will bring together organizations and personnel under controlled circumstance to establish and reinforce relationships and procedures for dealing with events that may be outside of their normal duties and experience.

Table top exercises are typically conducted in a meeting room setting with both external and internal staff. The staff reviews each other's roles and responsibilities to gain a wider understanding of the emergency response process. Generally, the participants walk through a simulated emergency and react to a variety of challenges. It is recommended that Table Top Exercises are conducted on an annual basis.

Full Scale exercises present a complex situation in a realistic environment. These types of exercises offer evaluations of operational capabilities of participating agencies. They are also very effective for public education. However, to be successful, these forms of exercises require detailed planning and dedicated resources to plan and implement. Town of High Level in cooperation with its partners may consider a Full-Scale Exercise every five years.

13.4 Mutual Aid Agreements

Emergency planning needs to include the development of effective mutual aid agreements to deal with incidents beyond the resources of Town of High Level. Mutual aid agreements need to consider municipal neighbors and government agencies. The essential components of an agreement – Who can request, who and what can respond, who will pay and how much, who is in charge? The agreement must include protocols and procedures to deal with emergencies in an expedient manner.

The Town of High Level has a Regional Service Sharing Agreement with Mackenzie County to provide services to that jurisdiction. The Town is a partner with the Northwest Alberta Emergency Resources Agreement which brings a wide range of resources from throughout northern Alberta. The Town also has a service agreement with the Paddle Prairie Metis Settlement. Town of High Level has developed the Regional Emergency Management Bylaw to meet the needs of the municipality and its partners Mackenzie County and the Town of Rainbow Lake.

Forestry Division

The Forest and Prairie Protection Act applies to all land within the Province of Alberta, except land within the boundaries of an urban municipality where there is no specific provision to the contrary. The Forestry Division is responsible for all wildland fires outside of the Town of High Level.

Town of High Level has entered into a Mutual Aid Fire Control Agreement with the Forestry Division. This agreement is a standard agreement that is signed by a number of municipalities in Alberta that are within or border the Forest Protection Area (FPA) of the province. An Annual Mutual Aid Fire Control Plan identifies the operating procedure and responsibilities during wildfire related incidents and establishes the fees for service and reimbursement rates for each agency. The Mutual Aid Fire Control Agreement states that the Forestry Division is responsible for wildfire and the Town is responsible for structural fire suppression.

The Mutual Aid Fire Control Agreement creates a formal structure for the provision of mutual aid and provides numerous advantages for both the Town and the Forestry Division. The inclusion of an Annual Mutual Aid Fire Control Plan insures an ongoing dialogue and a provision for updates between the agencies. Both the Town and the Forestry Division should be commended for their foresight and commitment to the agreement. The Plan includes the mechanism for immediate response by either party. The plan also includes the provision of forest firefighting equipment to the Town from the Forestry Division.

13.5 Wildland Firefighting Equipment

Town of High Level Fire and Rescue operate a Fire Station in the Town. The Town of High Level have committed substantial resources to provide the Fire Service with the necessary equipment to suppress fires within their jurisdiction. The Fire Service has a wide range of municipal fire apparatus and firefighters. The Service operates 3 Type 1 Engines, 3 Type 6 Engines, 1 T1 Tender, 3 Rescue, 2 Structure Protection Units, Air Supply Trailer, Cargo Trailer, Utility Truck and 2 Command Units.

The Town has a full time Wildland-urban Interface firefighting crew of four firefighters and associated equipment. The crew serves 40-hour weeks and has a type I engine, type 6 engine and the type 2 structure protection unit available for response either in the community or on provincial deployment. The crew serves in a wide variety of roles: emergency response to incidents, fire prevention, equipment maintenance and training. The crew works along with a similar crew in Rocky Mountain House, funded by the Government of Alberta.

Members of the Crew have been trained by FireSmart Canada to conduct Advanced FireSmart Home Assessments.

All apparatus carries forestry equipment. Tenders have portable drop tanks to allow for rural water shuttle operations. On the apparatus and in the structure protection unit, the Service maintains an inventory of forestry hose, sprinklers and Mark III Fire Pumps.

Apparatus is well equipped to respond to wildland fires. It has a wide range of equipment including sprinklers, forestry hose, portable pumps, generator, water backpacks, class A foam, water tanks and wildland hand tools.

Photo 31. Structure Protection Units

13.6 Incident Command Planning

Most emergencies are adequately handled with a single agency or occasionally mutual aid response. These types of incidents are best managed under the single command structure.

Wildland-urban interface incidents will often require the response of two or more agencies, each with its own legal obligations. These types of incidents are best managed under the Unified Command Structure. The larger the incident, the larger the organization required to effectively manage the emergency. Who is in charge? All agencies report to the Incident Commander.

Coordinated Response is an effective management tool for organizing a variety of agencies into one concerted effort and will improve the overall management of the incident. High Level Fire Department and the Forestry Division have agreed that Wildland-urban Interface fires in High Level be managed through a coordinated response as outlined in the AEMA Coordinated Response Best Practices Document. One coordinated response option is Unified Command.

Unified Command is implemented with the following guidelines:

- Start early. Use of unified command is routine and begins at the moment two or more agencies that have jurisdictional responsibility become involved at an incident. Avoid the idea that unified command only begins after the incident becomes a crisis.
- Establish and co-locate incident commanders at one command post. This avoids the confusion created by separate command, planning and logistical setups.
- No agency's authority is comprised.
- Develop one set of objectives for the entire incident.

High Level Fire Department and the Forestry Division have fully implemented the Incident Command System of emergency management. The Town Emergency Management system utilizes Incident Command in the delivery of the Community Emergency Management Plan. It is recommended that the Incident Command System be adopted by all agencies for emergency management.

FireSmart Action List-Emergency Response Planning

21. In the short term, a table top exercise would be valuable for all stakeholders. In the future, consider a full deployment exercise.
22. Adopt the Incident Command System for all emergency operations in Town of High Level,
23. Implement Wildfire Preparedness Guide and Sprinkler Deployment Plan for the Town.

14 FireSmart Action

The implementation of a Wildfire Mitigation Strategy is a long-term process. Some of the recommendations offered in this plan should be implemented immediately, while others may not occur for several years. The goal of the implementation plan is to set short-term and long-term objectives for each section of the plan based on priorities. Short-term objectives are those that should occur within two years while long-term objectives are those that should occur within the next five years.

Town of High Level has responsibility for the implementation of this plan. The plan should be reviewed annually to set the priorities for the year based on the implementation plan. Completion of objectives is dependent on available resources and budget funds for the project.

It should be recognized that public support is necessary for the implementation of the FireSmart priorities. Public education is necessary prior to vegetation management projects being implemented.

14.1 High Level Vegetation Management Implementation Plan

The vegetation management implementation plan for Town of High Level will be organized firstly by setting priorities for the different fuel modification and maintenance projects and offering both short- and long-term options to achieving the goals. The implementation of fuel management projects may be complex in considering the position of a wide variety of stakeholders.

14.2 FireSmart Action Lists for Implementation

Recommendations are consolidated with the responsible agency/agencies shown in the far right column. Town of High Level is shown as HL while the Forestry Division is GoA.

***FireSmart* Action List – Vegetation Management**	**Agency**
1. Develop detailed plans for fuel modification projects. Consult with stakeholders as part of plan development.	HL/GoA
2. Complete fuel modification projects and maintenance as funds, manpower, and resources become available.	HL/GoA
3. Commence fuel modification projects, based on recommended priorities as outlined in the implementation plan.	HL/GoA
4. A vegetation-free Immediate Zone must be developed and maintained in all developments. Immediate Zone standards are described by FireSmart Canada with the recommended standards. Public education for residents is paramount to the success of this recommendation.	HL
5. Areas susceptible to grass fires, such as the fire guard, road rights-of-way, industrial clearings, pipelines, and power line rights-of-way, should be evaluated on an annual basis to determine the need for fuel removal by prescribed burning or mechanical means to reduce fuel loading and hazard.	HL/GoA
6. Review developed areas and future development areas to ensure that all C2/C3 fuels are removed from Intermediate Zone and sufficient fuel modification is done in the Extended Zone to reduce wildfire threat to structures.	HL

FireSmart Action List – Legislation	***Agency***
7. Review and revise Municipal planning legislation to: - Require a Wildfire Risk Assessment and appropriate vegetation management in hazardous areas - Require the use of *FireSmart* exterior building materials and landscaping - Require decks to be skirted. - Require a 1.5m Immediate zone around all new dwellings.	

***FireSmart* Action List-Development Strategies**	**Agency**
8. Access should be developed in conformance with National Fire Protection Association standard 1141	HL
9. All future development should consider the standards within the NFPA 1142: Standard on Water Supplies for Suburban and Rural Fire Fighting and the National Fire Code - 2019 Alberta Edition	HL
10. Power shall be underground for all urban applications.	HL
11. The power company should initiate an annual hazard tree identification and removal program along all overhead power line rights-of-way within the Town.	HL
12. Continue to use parks and open spaces as vegetation-free safety zones and incorporate them into the development at the planning phase. Treed park and reserve areas should be considered for vegetation management to reduce the risk of wildfire occurrence and acceleration.	HL

***FireSmart* Action List – Education and Communication**	**Agency**
13. Consult with targeted stakeholders to determine specific direction for immediate action. Develop a focused community based public education program.	HL/GoA
14. Inform stakeholders about the FireSmart program and where to get further information.	HL/GoA
15. Inform stakeholders about strategies they can use to reduce the risk on their property.	HL/GoA
16. Continue with the use of social media.	HL/GoA

***FireSmart* Action List – Interagency Cooperation and Cross Training**	**Agency**
17. Continue with the high degree of communications between the High Level Fire Department and the Forestry Division.	HL/GoA
18. Consider fire bans during the spring and fall of the year during the cured grass stage. Continue with fire ban consistency with the Forestry Division.	HL/GoA
19. Develop a local FireSmart Committee to review and implement the Wildfire Mitigation Strategy.	HL/GoA
20. Continue with the existing cross training regime of ICS, WUI Crew Member, WUI Crew Leader etc. Encourage joint training sessions between the Fire Department and the Forestry Division.	HL/GoA

***FireSmart* Action List-Emergency Response Planning**	**Agency**
21. In the short term, a table top exercise would be valuable for all stakeholders. In the future, consider a full deployment exercise.	HL/GoA
22. Adopt the Incident Command System for all emergency operations in Town of High Level,	HL/GoA
23. Implement Wildfire Preparedness Guide and Sprinkler Deployment Plan for the Town.	HL/GoA

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