16 Mile

FIRESMART COMMUNITY ASSESSMENT REPORT

Prepared for

Thompson Nicola Regional District

October 2019

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Summary of Recommendations – Abbreviated

The FireSmart program provides detailed guidelines and recommendations to reduce home ignition potential during a wildfire. The recommendations made in this report must be considered *in addition* to those contained in the FireSmart *Protecting Your Community from Wildfire* manual. The following summary of recommendations is taken from Section 7 of this report, where additional detail and rationale is provided. These recommendations are specific for the community of 16 Mile but could also be applied to communities with similar characteristics.

Recommendations for 16 Mile

1. Reduce the presence of conifer and highly combustible plants used in landscaping, such as cedar and juniper shrubs and hedges within Zone 1 (<10m from the home). Refer to the *FireSmart Landscaping Guide* for recommended vegetation and landscaping materials

2. Propane tanks require 3m fuel free zones established. Best practice is to have them relocated 10m from home. Ensure relief valve functions and is directed away from structures.

3. Remove or store appropriately all combustibles in Zone 1 – including personal items such as trailers, recreational vehicles, tools, building materials, etc.

4. Apply FireSmart principles to any outbuilding within 15m of a structure

5. Removal of ladder fuels and increase conifer spacing within Zone 2 (10-30m) and Zone 3 (30-100m).

6. Zones (up to 100m away from a home) that fall onto crown land should be assessed by a qualified professional to determine course of action

7. Remove firewood stacks from Zone 1 during times of wildfire threat

8. When away for lengths of time during high wildfire threat, consider items such as rattan door mats, flammable patio furniture, children's toys, trash cans, BBQs, etc. as combustibles and store away

9. Create a local FireSmart Board and Community Plan to maintain awareness and community participation

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1.0 Introduction

The FireSmart approach is designed to provide and effective management approach for preserving wildland living aesthetics while reducing community ignition potential during a wildland urban interface (WUI) fire. The program can be tailored for the adoption by any community and/or neighborhood association that is committed to ensuring its citizens maximum preparation for wildland fire. The following Community Assessment Report (CAR) is intended to be a resource for residents of 16 Mile for carrying out the recommendations and actions.

The CAR was developed by a trained Local FireSmart Representative (LFR). This assessment addresses the wildfire-related characteristics of 16 Mile. It examines the area's exposure to wildfire as it relates to ignition potential. The assessment does not focus on the specific homes, but examines the community as a whole.

Funding for the Thompson Nicola Regional District – 16 Mile – FireSmart project was provided by FireSmart project was provided through the Community Resiliency Investment program and was provided by the Union of BC Municipalities. The grant enabled the regional district to retain the services of Frontline Operations Group to conduct the project.

Community assessment was carried out on July 30, 2019 by Brittany Seibert, LFR.

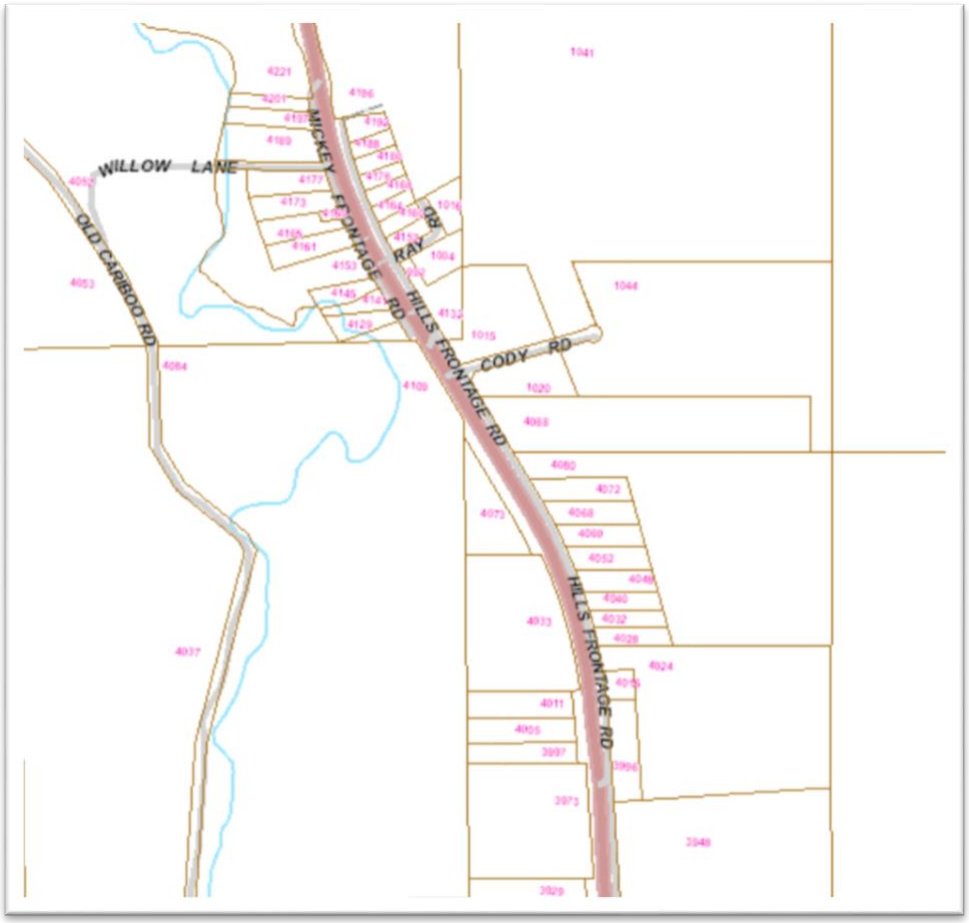

Figure 1 16 Mile Community

2.0 Definition of Ignition Zone

16 Mile is located in a wildfire environment. The wildland areas surrounding the community are typical ecosystems that have developed, historically, from frequent low intensity fires. With the introduction of modern forest protection policies, the typical fire cycle has been interrupted thus contributing to a host of cascading ecological effects including the buildup of forest fuels.

Wildfires will happen in the Thompson Nicola region – exclusion from wildfire is not a choice. In 2017 the province of British Columbia was subjected to one of the worst fire seasons in its history. Over 1.2 million hectares were burnt and roughly 65,000 residents were evacuated. The Thompson Nicola region alone saw one of the most devasting fires of that year, Elephant Hill. The fire discovered on July 6, 2017 continued to burn for another 76 days and consumed over 190,000 hectares. Over the course of the fire, over 120 homes were destroyed.

A house burns because of its relationship with everything in its surrounding home ignition. To avoid a home ignition, a homeowner must eliminate the wildfire's potential relationship with their house. This can be accomplished by interrupting the natural path a fire takes by clearing fuel from the home ignition. To accomplish this, flammable items such as excessive vegetation and flammable debris must be removed from the areas surrounding the structure. This will prevent ignition of fuel sources in proximity of the structure and prevent direct contact of flames with the home. Reducing the volume of fuels and reducing its ability to move vertically will affect the intensity of the wildfire as it nears the home.

Included in this assessment are observations made while visiting 16 Mile. The assessment addresses the ease with which home ignitions can occur under severe wildfire conditions and how these ignitions might be avoided within the home ignition zones of affected residents. 16 Mile residents can reduce the risk of structure loss during a wildfire by taking actions within their home ignition zones – which includes a house and its immediate surroundings within 100 metres (figure 2). Given the extent of these zones, the ignition zones of several homes sometimes overlap, and often spill over onto adjacent public or community land.

The results of the assessment indicate that wildfire behavior and subsequent losses will be dominated by the residential characteristics of this area. The good news is that residents will be able to substantially reduce their exposure to loss by addressing community vulnerabilities. Relatively small investments of time and effort will reap great rewards in wildfire safety.

Figure 2 FireSmart Canada utilizes the concept of priority zones surrounding a home to help residents prioritize their hazard reduction efforts. A home's immediate surroundings (Zones 1 and 1a) are of immediate concern to the homeowner and should be targeted aggressively to reduce ignition hazards to the home.

3.0 Description of the Fire Environment

Wildland fire behavior is influenced by the interaction of three broad environmental factors: fuel, weather and topography. Collectively these factors describe the fire environment and determine the intensity and rate of spread of a wildland fire. A working knowledge of the factors that characterize the fire environment is helpful for building an awareness of hazard mitigation at the site level.

3.1 Fuels

In the context of wildland fire, fuel refers to the organic matter involved in combustion. In Canada, wildland fuels are classified into 16 fuel types within the Canadian Forest Fire Behavior Prediction (FBP) System. The FBP system is informed by the Canadian Forest Fire Danger Rating System (CFFDRS), which is the primary tool to obtain predictive wildfire management intelligence used by agencies across Canada.

When dealing with the wildland-interface environment fuel can extend beyond the surrounding vegetation. Fuels can include a structure's composition, neighboring buildings, vehicles and other combustible materials found around the home – see section 6.3

3.1.1 Fuel Layers

The structure and arrangement of fuels are described in terms of their horizontal and vertical continuity within three broad layers of the fuel complex – ground fuels, surface fuels and canopy (or aerial) fuels (Figure 3). Ground fuels occupy the *duff layer* and the uppermost portions of the soil mineral horizon. In general terms, the duff layer is comprised of decomposing organic material and is found beneath the litter layer and above the uppermost soil mineral horizon (A-horizon). The components of the duff layer

lack identifiable form due to decomposition (as opposed to the *litter layer*, which is composed of identifiable material).

The surface fuel layer begins above the duff layer and extends 2m vertically. Surface fuels are characterized by the litter layer (leaves, needles, twigs, cones, etc.) as well as plants and dead woody material up to a height of 2m. In some cases, surface fuels may act as *ladder fuels* that can carry fire from the surface fuel layer into the canopy layer.

Canopy fuels are the portions of shrubs and trees that extend from 2m above the duff layer, upwards to the top of the fuel complex. Certain tree species, such as several spruce species (Picea sp.) are characterized by branches extending down to the forest floor, whereby these lower branches act as ladder fuels. Other species, particularly those found in drier, fire-maintained ecosystems, such as Ponderosa pine, lack these ladder fuels and form a distinct separation between the surface fuel layer and canopy fuel layer.

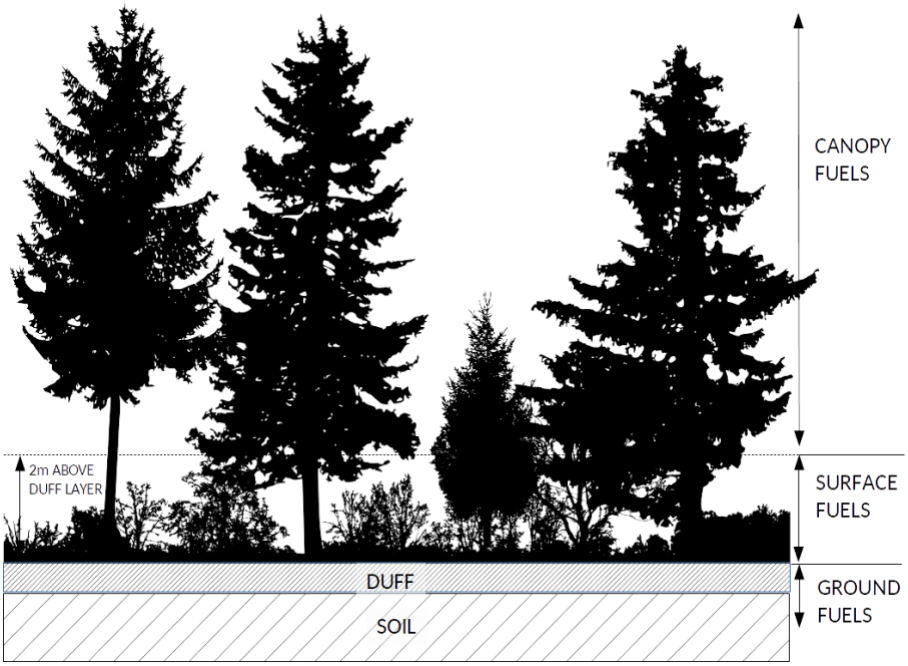

Figure 3 Wildland fuels can be described within three broad fuel layers: Ground fuels, surface fuels (to a height of 2m above the duff layer), and canopy fuels. Canopy fuels are also referred to as aerial fuels

3.1.2 Fuel Size

Wildland fuel can be further described in terms of relative size – so called *fine fuels* and *coarse* or heavy fuels. Fine fuels include leaves and conifer needles, grasses, herbs, bark flakes, lichen, twigs etc. Large branches, downed logs and other large woody material are considered coarse or heavy fuels. Fine fuels have a higher surface area to volume ratio than coarse fuels, and this characteristic influences the rate of drying and ease of ignition.

With a higher surface area to volume ratio than course fuels, fine fuels are more readily influenced by changes in environmental conditions (e.g. relative humidity, wind, precipitation etc.). As well, dead fine fuels react to changes in environmental conditions at a relatively faster rate than green (i.e. live) fine

fuels.

When available to burn, fine fuels ignite more easily and spread fire faster than coarser fuels. This characteristic makes fine fuels particularly susceptible to ignition from firebrands (or embers). Additionally, fine fuels are more susceptible to becoming firebrands – mobile ignition sources – as they are lighter and more easily made airborne. Finally, fine fuels take a shorter time to burn out than coarser fuels.

For any given fuel, the more there is and the more continuous it is, the higher the intensity of the fire will be and the faster the fire will spread.

3.2 Weather

Weather condition affect the moisture content of wildland fuels and influence the rate of spread and intensity of a wildland fire. Weather is the most dynamic element of the fire environment and the most challenging to assess and forecast. There are four main components of weather to consider when discussing wildland fire behavior: wind, temperature, relative humidity and precipitation.

3.2.1 Wind

Wind speed and direction influences the rate and direction of spread of a wildland fire. The application of wind on open flame has the effect of tilting the flame away from the wind, and, in the case of wildland fire, placing the flame into closer proximity (or contact) with downwind fuels thus contributing to fire spread.

Wind can also contribute to a preheating effect on fuel immediately downwind from open flame. Wind hastens the drying process of exposed fuel, with the rate of drying being a function of the surface to volume ratio. Having a relatively higher surface area to volume ratio, fine fuel moisture content is affected to a greater degree by wind when compared to coarse fuel.

Lastly, wind can also influence the ignition of a new wildland fire through its contribution to spotting. Ignited fine fuels – that have become airborne through rising thermal air – can be carried by wind over the course of large distances. These firebrands result in the ignition of new fuels cultivating in new fires.

3.2.2 Temperature and Relative Humidity

Temperature and relative humidity have a close and inverse relationship – as temperature increases, relative humidity decreases. This is because relative humidity is the percent of water vapor in the air compared to what would be present if it were saturated. As air is heated through increasing temperatures, its ability to hold more moisture also increases. However, without the introduction of more moisture the percentage decreases.

$$rH = \frac{\text{Amount of moisture currently in the air}}{\text{Amount of moisture air can hold}} \times 100$$

The moisture content of wildland fuel is constantly seeking to equalize with moisture content of the surrounding air. This effect is most pronounced in dead fuel. When the relative humidity is high, dead

fine fuels will readily absorb moisture from the air and conversely, when the relative humidity is low, dead fine fuels will readily give up moisture to the air.

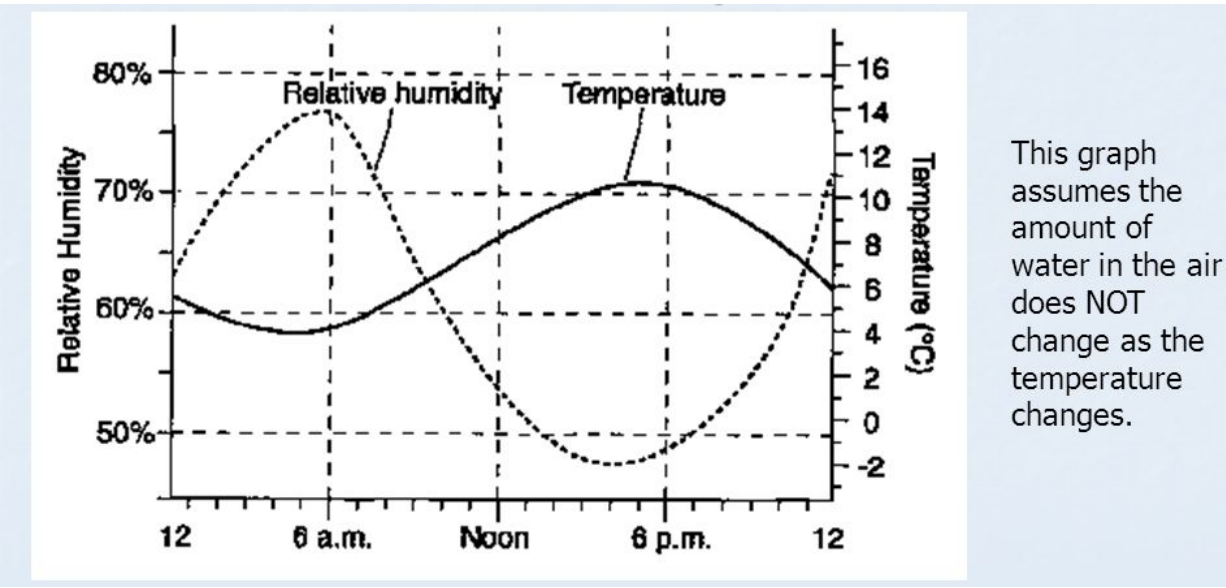

Figure 4 shows the relationship between temperature and relative humidity, as temperatures increase and the overall water content in the air does not change, relative humidity decreases. This affects fire behavior through the increased drying of fuels

3.2.3 Precipitation

The effect of moisture on wildland fuel is dependent on the size and state of the fuel. The moisture content of dead fine fuel is highly reactive to changes in relative humidity, precipitation and wind. Fine fuels require less precipitation to reach saturation than course fuels, and in turn, dry out at a faster rate.

Precipitation's arrival in the form of thunderstorms can inadvertently increase fire behavior, even if for short time. Thunderstorms can generate large influxes in wind through in and out flows, and downdrafts which have adverse effects on fire behavior.

3.3 Topography

In the context of the fire environment, topography refers to the shape and features of the landscape. Of all the topography factors in fire behavior, the primary importance for an understanding of fire behavior is slope. When all other factors are equal, a fire will spread faster up a slope than it would across flat ground. When a fire burns on a slope, the upslope fuel particles are closer to the flame compared to the downslope fuels. This pre-heating effect on upslope fuels contributes to fast upslope fire spread. As well, hot air rising along the slope tilts the flame uphill which further increasing the ease of ignition of upslope fuels.

Topography influences fire behavior principally by the steepness of the slope. However, the configuration of the terrain such as narrow draws, saddles and so forth can also influence fire spread and intensity. Slope aspect (i.e. the cardinal direction that a slope faces) determines the amount and quality of solar radiation that a slope will receive, which in turn influences plant growing conditions and drying rates.

4.0 Site Description

16 Mile is located approximately 13km north of Cache Creek, BC along the Highway 97. Nearby landmarks include the Bonaparte River bordering to the west, and Hat Creek Ranch located to the south. It includes ~40 homes, many with several outbuildings located on the property. The community is spilt by HWY 97 with the community located immediately to the west and the to the east.

Road access to the neighborhood located to the east is accessed from multiple access points from the highway and contain a looped road system. With the exception of Mickey Frontage Rd., properties located to the west of the highway feature single access/egress points. The community is also characterized by what appears to be a large scrap yard located to southwest of the community.

All structures feature a variety of ember accumulator features such as complex roof shapes, deck configurations and open (unsheathed) deck constructions and open carports. All structures feature a high degree of vulnerability to ignition of structures and Priority Zone 1 combustibles by wind driven embers. Lots are of varying sizes but are mostly standard size and configuration with homes separated from each other by 10-20m. Natural vegetation on the properties has been retained with additions of planted trees, hedges and ornamental plants.

4.1 Fuel Type

Classifying fuel complexes in BC according the FBP fuel types is an imperfect process, given the diversity of ecosystems in the province in comparison to the rest of Canada. When considering FBP fuel types for a particular fuel complex, the actual species composition is of less importance than the overall stand structure characteristics. The FBP fuel types referenced below specify. Certain species not found in BC (e.g. red pine and eastern white pine, etc.), however the overall structural characteristics of the fuel types share similarities with the 16 Mile site conditions. Herein lies the challenge of classifying certain BC forest types into a handful of FBP fuels types. In the 16 Mile area, the most appropriate FBP fuel types are:

4.1.1 C7 Fuel Type*

The C7 Fuel type is characterized by relatively open (<50% canopy closure), uneven-aged stands of Ponderosa pine and Douglas fir (Pseudotsuga menziesii). Generally, surface fuels are characterized by perennial grasses, herbs, and scatter shrubs. In the absence of periodic fire (or other maintenance), needle litter tens to build up and persist for some time. Duff layers are relatively shallow – typically less than 3cm.

4.1.2 O1 Fuel Type*

The O1 fuel type is characterized by continuous grass cover, with no more than occasional trees or shrub clumps that do not appreciably affect fire behavior. Two subtype designations are available for grasslands; one for the matted grass condition common after snowmelt or in the spring (O1-a) and the other for standing dead grass common in late summer to early fall (O1-b). The proportion of cured or dead material in grasslands has a pronounced effect on fire spread there and must be estimated with care.

4.1.3 M2 Fuel Type*

This fuel type (and its "leafless" counterpart, M1) is characterized by stand mixtures consisting of the following coniferous and deciduous tree species in varying proportions: black spruce (*Picea mariana* (Mill.) B.S.P.), white spruce (*Picea glauca* (Moench) Voss), balsam fir (*Abies balsamea* (L.) Mill.), subalpine fir (*Abies lasiocarpa*(Hook.) Nutt.), trembling aspen (*Populus tremuloides* Michx.), and white birch (*Betula papyrifera* Marsh.). On any specific site, individual species can be present or absent from the mixture. In addition to the diversity in species composition, stands exhibit wide variability in structure and development, but are generally confined to moderately well-drained upland sites. M2, the second phase of seasonal variation in flammability, occurs during the summer. The rate of spread is weighted according to the proportion (expressed as a percentage) of softwood and hardwood components. In the summer, when the deciduous overstory and understory are in leaf, fire spread is greatly reduced, with maximum spread rates only one-fifth that of spring or fall fires under similar burning conditions.

**Excerpt from CFFDRS FBP*

4.2 Fire Weather

The climatic conditions of the southern and central region of the Thompson-Nicola can be broadly characterized by warm, dry summers and cool winters. 16 Mile is located in a semi-arid climate, with the July to August period having the lowest average relative humidity and highest daily average temperatures.

4.3 Topography

16 Mile is located in a valley system in the west-central region of the Thompson Nicola. The community itself is located on a natural bench, approximately mid slope. The lower slope (west) was assessed at <10% with the upper slope (east) assessed at 15-30%. Slope to the west of the highway is likely to have little effect on fire behavior. This is due to the gentle slope percentage and the heavy presence of deciduous species. Slope to the east of the highway is likely to have a more indirect effect on home ignitions. It is likely that the slope will encourage wildfire to burn away from the community however, its effect in increasing fire intensity may result in firebrand creation which can then be carried downslope into the community.

Topography is also likely to influence wind directions and speed.

Figure 5 Satellite imagery of the 16 Mile community

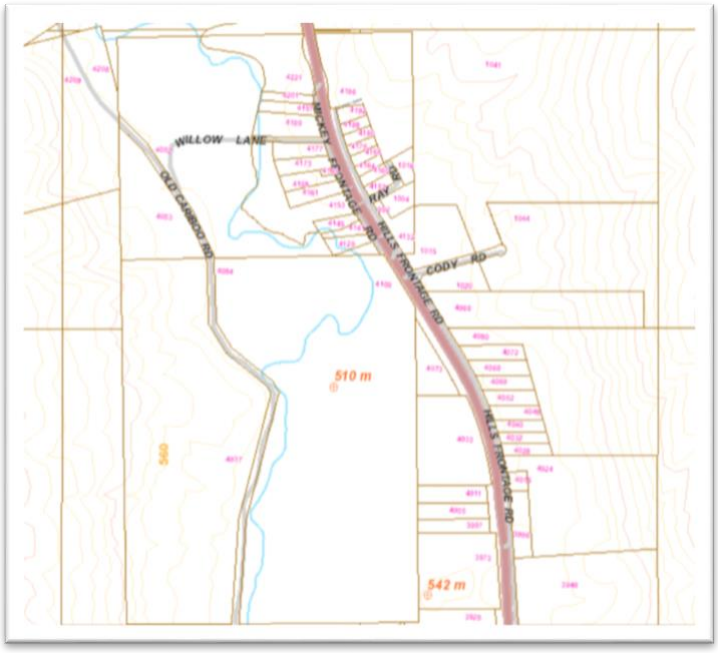

Figure 6 Contour map of the 16 Mile community

4.4 Human Ignition Potential

There are opportunities within the community for human ignited wildfires. Poorly managed burning on private land – including campfires – can result in ignition of nearby vegetation. Additionally, the major highway that divides the community (HWY 97) also increases the risk of ignition sources from passing motorists. This can include fire resulting from motor vehicle accidents and fire resulting from thrown ignition sources (i.e. cigarette butts).

5.0 Assessment Process

The 16 Mile community was assessed by Local FireSmart Representative, Brittany Seibert, during her visit on July 30, 2019. The community and adjacent vegetation within a least a 100m radius was assessed and observations were recorded using the *FCCRP Community Hazard Assessment Form* (see Appendix 2).

The assessment process noted a number of attributes that contribute both negatively and positively towards the risk of property damage/loss due to a wildfire event.

As part of the FireSmart project – funded by the TNRD – a FireSmart public talk was given on the same day at a local resident's house in the 16 Mile community. The objective of the talk was to educate home owners on the use of the *FireSmart Site and Structure Hazard Assessment Form* to help identify and prioritize hazards as they relate to wildland fire and their homes. The invitation was open to all members of the community and was advertised through the TRND's Facebook page. As well a community champion contacted several residents within the community to ensure they knew about the event. There were 18 people in attendance.

6.0 Observations and Issues

The following observations were noted during the community wildfire hazard assessment. See Appendix 2 to view the entire community wildfire hazard assessment form and notations.

6.1 Roof Assemblies

A home's roof is the largest surface that is most exposed to embers during a wildfire. Homes with a flammable wood shake roof have a much higher probability of igniting during a wildfire compared to a non-wood roofing system. Homes, and other structures, in the 16 Mile community were seen to have fire-rate roofing materials (either asphalt or metal). Roofs appeared to be in good condition with no accumulation of combustible debris. Clean roofs will mitigate the potential of burning debris that may challenge a roof's fire resistance and reduce the chance of igniting another fuel source.

6.2 Building Exteriors

Risk factors associated with the exterior surface of a structure are less dependent on the characteristics of the exterior cladding system (e.g. stucco vs. cement board vs. vinyl siding etc.) and more dependent on the likelihood of direct flame contact and/or ember accumulation on the structure. Accumulated fuel along an exterior wall can negate the fire-resistant advantages that any particular exterior cladding system provides, should the fuel ignite (figure 7). The removal of fuel accumulations along any exterior wall should be of much greater concern than the actual composition of the wall itself.

Figure 7 The presence of nearby conifer vegetation and other combustible plants is a threat to home ignition. They are relatively easy to ignite and will sustain high-intensity heat that will challenge the building's exterior and its resiliency against fire.

6.3 Nearby Combustibles

In the context of the structure and site hazard assessment, *nearby combustibles* refer to non-vegetative fuel, such as firewood, wood fences, sheds, vehicles etc. Outbuildings are of particular concern if they located within 15m (45ft) of the home. Outbuildings pose a threat to the ignition of a home because they are able to sustain extreme radiant heat for over longer periods of time. There is an additional risk of firebrand production which poses a risk to any nearby structures or fuel sources. Any outbuilding that is located within 15m (45ft) should have FireSmart principles applied to mitigate potential ignition.

Several properties within the community were seen with a heavy presence of machinery, trailers/RVS, and automobiles (function and non-functional). These items are often not thought of as combustible however many of these items contain flammable material(s). FireSmart principles should be applied and these items should either be appropriately stored away or moved away from the home (>10m).

Figure 8 Propane tanks should be cleared of vegetation to mitigate any contact with open flame

Propane tanks were a common characteristic within the community. Propane tanks surrounded by dense concentrations of vegetation are potential bombs. When the wildland fuels near the tanks burn during an interface fire, the internal pressure of the tank can cause the tank to vent through a relief valve. This will create an intense fire that could ignite nearby combustibles. Propane tanks should be checked regularly to ensure relief are functional. Failure of a relief valve can result in a boiling liquid vapor explosion, which can be catastrophic to both surrounding structures and responding personnel.

Direct flame contact is often thought of as the primary factor in home ignition and subsequent loss. However, recently it has become more apparent that ignition from a firebrand is the most likely scenario. Because of this, innocuous items commonly found around the outside of a home may act as combustibles that could ignite the home. Flammable patio furniture (particularly seat cushions), sisal doormats and rats, or even a corn broom leaning against the house are all potential fuels that could ignite from ember accumulation.

6.4 Vegetation

Vegetation is assessed in three concentric zones around a home (Figure 2), with Priority Zone 1 (PZ-1) being the area occupying the first 10m (30ft) around the structure. More recently Zone 1a (PZ-1a), known as the *non-combustible zone,* has been added to distinguish the importance of the first 1.5m (4.5ft) from a structure. The quantity and condition of canopy, ladder and surface fuels are the key factors assessed in regards to vegetation.

In 16 Mile Pondarosa pine and Douglas Fir were seen predominantly throughout the community alongside several various deciduous species. Other combustible plants were seen within the PZ-1(a) including spruce, and cedar and juniper shrubs/hedges. Deciduous tree species are the recommended vegetation to be planted within the PZ-1(a) as they are naturally resistive to intense wildland fire behavior. This is because the species lacks the ladder fuels for vertical fire growth, maintains a higher moisture content within its leaves, and has smooth, tight bark that makes it difficult for fire to climb.

Conifer species, particularly spruce, pose a significant risk when found within the PZ-1(a). They offer easily accessible ladder fuels for wildland fire to reach the canopy and create large amounts of needle

litter sustaining surface fire. Cedar and Juniper shrubs and hedges are also problematic from a home ignition perspective. These species are rich in organic volatile compounds and terpenes making them easily ignitable.

Figure 9 The 16 Mile community has many factors that will influence fire behavior and home ignition potentials. This include topography, fuel types and common combustibles throughout the community. The proximity of homes to one another within the community demonstrates the need for total community involvement to ensure all zones have been mitigated.

Most homes in the 16 Mile community have priority zones that fall onto other private and public land. This is a common characteristic for higher-density WUI areas and commonly pertains to PZ-2 and PZ-3 in rural communities. And while treatment of PZ-1a and PZ-1 alone can still significantly reduce the threat of home ignition during a wildfire event, it is important for the community to recognize the benefit of a collective effort. A combined FireSmart effort of many individuals can increase the overall wildfire resilience of the entire neighborhood/community. The same holds true when one (or more) homes aren't FireSmart as they pose a threat to adjacent homes that are.

7.0 Recommendations

FireSmart seeks to create a sustainable balance that will allow communities to live safely while maintaining environmental harmony in a wildland urban interface (WUI) setting. Homeowners already balance their decisions about fire protection measures against their desire for certain flammable components on the properties. It is important for them to understand the implications of the choices they're making. These traces directly relate to the ignitability of their home ignition zones during a wildfire.

A home owner/community must focus attention on the home and surrounding area and eliminate the fires potential relationship with the house. This can be accomplished by disconnecting the house from high and/or low-intensity fire that could occur around it, and by being conscious of the devastating effects of wind driven embers.

The following section of this report provides recommendations for consideration by the 16 Mile

community concerning wildfire safety issues that were identified as priorities during the assessment:

- Removal of conifers and combustible plants within the Zone 1 (0-1.5m) and Zone 1 (1.5-10m) will significantly reduce the fire hazard rating for structures and properties within the community.

- Propane tanks should have all vegetation within 3 meters cleared away. If possible, it is best to locate tanks at least 10m away from the building. Homeowners should ensure that the relief valve is functional and is pointed away from home and surrounding structures.

- Personal items such as trailers/RVs, recreational vehicles, tools, building materials, etc. are all considered combustible and should be stored appropriately or removed from zone 1 (>10m from home).

- Neighboring buildings such as sheds or detached garages located within 15m of the home should also be considered as a fuel source. It is recommended that they also have FireSmart mitigations done to and around them to prevent ignition.

- Fuel loads reduction in Zone 2 (10-30m) and Zone 3 (30-100m) should focus on the removal of ladder fuels and increasing spacing of conifers to 3m apart. This will help to a reduce fire intensities through the stand.

    - Priority zones (up to 100m from the homes) that falls onto crown land should be assessed by a qualified professional. Recommendation for next steps can be given thereafter.

- Homes with firewood stacks are reminded during wildfire season to have wood stacked a min. of 10m away from the structure. Firewood may be moved closer during times when wildfire threat is low. Homewards are reminded to stay vigilant on weather changes. Wildfire seasons in the past have demonstrated various peak burning periods throughout the calendar year.

- When fire weather is severe and the home is unoccupied, homeowners should remember not to leave flammable items outside. This includes rattan doormats, flammable patio furniture, children's toys and trash cans.

It is recommended that the community come together to create FireSmart Community Plan regardless of the community's intention to seek FireSmart Community Recognition status. A FireSmart Community Plan is generally a simple action plan, comprised of at least three agreed-upon, doable action items that will improve a community's wildfire readiness. The Community Plan can be modified with the passage of time and renewed with each new wildfire season.

8.0 Successful FireSmart Mitigations

When adequately prepared, a house can likely withstand a wildfire without the intervention of the fire service. Further, a house and its surrounding community can be both FireSmart and compatible with the area's ecosystem. The FireSmart Communities program is designed to enable communities to achieve a high level of protection against wildfire loss even as a sustainable ecosystem balance is maintained.

Other than the replacement of an unrated wood roof or replacing a flammable deck, most FireSmart hazard mitigations around the home are inexpensive and straightforward. In many ways, hazard mitigation and spring yardwork go together and can be scheduled as such. Most often it is the small things that a homeowner attends to that can make a big difference in whether their home will survive during a WUI fire. The following are good examples of small steps that homeowners within the Thompson Nicola Regional District have put in place that make their homes – and subsequently their community – more resilient to wildfire:

8.1 Fire-Resistant Roofing

Replacing a roof is one of the single-most expensive FireSmart improvements. The combination of a rate roof that is free of fuel accumulations is a big step to improving the survivability of a home during wildfire event.

Figure 10 Fire-rated roofing material is proven to be highly resilient against home ignition during a wildfire event. Roof design can also contribute to mitigation of debris accumulation by minimizing valleys and pinch point where debris can be captured

8.2 Landscaping

Simple landscaping changes to one's respective Zone 1 can make all the difference in preventing home ignition. Replacing bark mulch with rock, replacing conifers with deciduous, and utilizing low flammable plants within gardens are all great steps one can make towards increasing their home's resiliency. Maintaining a green lawn is the best standard however, a mowed lawn is still a fire-resistant lawn – grasses shorter than 10cm are less likely to burn intensely. Removal of dead leaves and pine needle litter will also help to reduce fuel sources within the yard.

Figure 11 This home demonstrates several FireSmart landscaping attributes. The gravel provides a non-combustible surface creating a break from direct flame contact to the home. Conifers have been removed up to 10m away and ladder fuels have been cleared. Leafy, deciduous plants are the preferred vegetation to be found in zone 1.

9.0 Next Steps

After reviewing the contents of this assessment and its recommendations, it is up to the 16 Mile community to determine whether or not they will implement the recommendations. The recommendations and FireSmart guidelines noted above are proven and time-tested to be effective in reducing the risk of wildfire losses. It is believed that there is great potential for the community and its residents to work together to reduce the wildfire threat quickly and substantially by acting to mitigate priority issues.

Should the 16 Mile community wish to seek FireSmart Community recognition status it is encouraged for them to contact the Local FireSmart Representative and to also create a FireSmart Board. A FireSmart Board is a multi-disciplinary group of volunteer representatives of the neighborhood or community who are responsible for driving the FireSmart initiative in their community and ensuring the recognition criteria are met.

If the report and the recommendations are accepted and recognition will be sought, the 16 Mile FireSmart Board will create agreed-upon, area-specific solutions to the FireSmart Community Assessment Report recommendations to prepare a FireSmart Community Plan in cooperation with their Local FireSmart representative and local fire agency personnel who may be acting as advisers.

If 16 Mile seeks to achieve the national recognition as a FireSmart Community, the following standards should be incorporated into its FireSmart Community Plan:

- Sponsor a local FireSmart Board that maintains the FireSmart Community program and recognition status

- Continue to work with the Local FireSmart Representative or enlist the assistance of a WUI specialist to complete a FireSmart Community Plan which identifies agree-upon, achievable local solutions

- Invest a minimum of $2.00 annually per capita in its local FireSmart Events and activities and activities (work done by municipal employees or volunteers*, using municipal or other equipment, can be included, as can provincial/territorial grants dedicate to that purpose).

- Hold a FireSmart Event (e.g. FireSmart Day) each year that is dedicated to a local FireSmart project.

- Submit an application form or annual renewal application form with supporting information to FireSmart Canada. This application or renewal process documents continuing participation in the FireSmart Communities Program with respect to the above criteria.

** Volunteer hours are calculated at a rate of $21 per hour or at the rate of service being voluntarily given*

10.0 Signature of Local FireSmart Representative

Signed:	Date signed:	
Brittany Seibert	October 25, 2019	Brittany Seibert, LFR Frontline Operations Group, Ltd. Brittany@frontlineops.ca

APPENDIX 1: Resources

- FireSmart Canada

  https://www.firesmartcanada.ca

- FireSmart British Columbia

  https://firesmartbc.ca

- FireSmart Begins at Home Assessment

  https://firesmartbc.ca/wp-content/uploads/2019/07/FireSmart-Home-Assessment.pdf

- FireSmart Canada Community Recognition Program (FCCRP)

  https://firesmartbc.ca/resource/how-to-apply-for-the-firesmart-canada-community-recognition-program-fccrp/

  https://firesmartbc.ca/wp-content/uploads/2019/01/FCCRP-Application-Form-1.pdf

- FireSmart Guide to Landscaping

  https://www.firesmartcanada.ca/mdocs-posts/firesmart-guide-to-landscaping/

APPENDIX 2: Community Wildfire Hazard Assessment Form

This Community Wildfire Hazard Assessment form provides a written evaluation of the overall community wildfire hazard – the prevailing condition of structures, adjacent vegetation and other factors affecting the FireSmart status of a small community or neighbourhood. This hazard is based on the **hazard factors** and **FireSmart recommended guidelines** found in **FireSmart: Protecting Your Community from Wildfire** (Partners in Protection, 2003) and will assist the Local FireSmart Representative in preparing the FireSmart Community Assessment Report. **NOTE: Mitigation comments refer to the degree to which the overall community complies or fails to comply with FireSmart recommended guidelines with respect to each hazard factor**

Community Name: 16 Mile		**Date: (mm/dd/yyyy)** July 30, 2019
Assessor Name: Brittany Seibert		**Accompanying Community Member(s):**
Hazard Factor	**Ref**	**Mitigation Comments**
1. Roof Assemblies		
a. Type of roofs ULC rated (metal, tile, asphalt, rated wood shakes) unrated (unrated wood shakes)	2-5 3-21	All roofs seen were a mixture of fire-rated material. Asphalt was the primary choice of roofing material, with metal being a secondary.
b. Roof cleanliness and condition * *Debris accumulation on roofs/in gutters; curled damaged or missing roofing material; or any gaps that will allow ember entry or fire impingement beneath the roof covering*	2-6	Roofs appeared to be free and clear of combustible debris. Most roofs appear to be in good condition. Occasional roof seen starting to show its age.
2. Building Exteriors		
2.1 Materials		
a. Siding, deck and eaves	2-7 2-8 2-9	Mixture of housing exteriors included both vinyl and wood. Both materials are considered non-rated and appropriate mitigations to reduce direct flame contact should be taken.
b. Window and door glazings (single pane, sealed double pane)	2-10	Structures are year-round residence and are assumed to be double paned windows. Some outbuildings can be assumed to have single paned windows.

c. Ember Accumulator Features (scarce to abundant) * *Structural features such as open eaves, gutters, unscreened soffits and vents, roof valleys and unsheathed crawlspaces and under-deck areas*		All structures have a variety of ember accumulator features – deck configuration and open (unsheathed) deck construction and complex roof shapes.
d. Nearby Combustibles – firewood, fences, outbuildings	2-11	No signs of firewood stacks; several yards with heavy fuel loads of automobiles, machinery, sheds and barns. Several homes seen with propane tanks.

Hazard Factor	Ref	Mitigation Comments
3. Vegetation		
3.1 **PZ-1:** Vegetation - 0 - 10m from structure **Page Reference 3-5**		
a. Overstory forest vegetation (treated vs. untreated)	2-14	Majority of homes are free from overstory. Those with overstory mainly seen with deciduous species. A reminder to homeowners with conifers within 10m of home to have them removed or mitigated from ladder fuels to the highest standard
b. Ladder fuels (treated vs untreated)	2-17	Several homes seen in community with combustible brush/shrubs against homes
c. Surface fuels - includes landscaping mulches and flammable plants (treated vs untreated)	2-16	Grasses within 10m of structures are recommended to be maintained and kept below 15cm of growth. Mixture of properties seen with maintained lawns vs. high grasses
3.2 **PZ-2:** Vegetation - 10 - 30m from structures **Page Reference 3-9**		
a. Forest vegetation (overstory) treated vs untreated	2-14	NE of HWY 97: C7 and O1 fuel type. Minimal overstory with most available fuel being the wild grasses and sage brush SW of HWY 97: C7/O1 as well as M2 (75% deciduous, 25% conifer).
b. Ladder fuels treated vs untreated	2-17	NE of HWY 97: Low lying branches of sparse conifers and tall grasses are most likely source of ladder fuels SW of HWY 97: Increase abundance of fuel with a mixture of both non-combustible and combustible shrubs/brush, and tall grass. Fire activity likely to see candling but unlikely to see aggressive continuous crown fire
c. Surface fuels treated vs untreated	2-16	Wild grasses and sage brush seen on both sides of HWY 97
3.3 **PZ-3:** Vegetation - 30 - 100m from structures **Page Reference 3-13** Provide mitigation comments on the prevailing PZ3 fuel type		
a. Light fuel - deciduous – grass, shrubs	2-16	Wild grasses and sage brush

Hazard Factor	Ref	Mitigation Comments
b. Moderate fuel - mixed wood – light to moderate surface and ladder fuels, shrubs	2-17	NE of HWY 97: C7/O1 SW of HWY 97: C7/O1 with pockets of M2
c. Heavy fuel - coniferous - moderate to heavy surface and ladder fuels, shrubs	2-14	NE of HWY 97: N/A SW of HWY 97: Spaced out conifer with fuel breaks of deciduous amongst the crowns
d. Logging slash, dead/down fuel accumulations	2-16	N/A
e. Diseased forest – without foliage vs with foliage		N/A
f. Fuel islands within community - treated vs untreated		N/A
4. Topography		
4.1 Slope (within 100m of structures)		
a. Slope - Flat or < 10 %, 10 – 30% or >30%	2-19	Flat or <10% on the SW side of HWY 97. Slope on NE side 10-30% depending on location on slope
4.2 Buildings setback on slopes >30 %, position on slope Provide mitigation comments on items a – c as applicable		
a. Setback from top of slope > 10m, or bottom of slope – valley bottom. b. Buildings located mid-slope c. Setback from top of slope <10m, or upper slope	2-12	Homes on the SW side of HWY 97 are unlikely to be affected by the slope regardless of position due to the low slope grade and the accumulation of deciduous vegetation between the river and structures. Homes on the NE side of HWY 97 are located at the valley bottom, or bottom of slope

Hazard Factor	Ref	Mitigation Comments
5. Infrastructure – Access / Egress, Roads, Driveways and Signage		
5.1 Access Routes – Road Layout To FireSmart Recommended Guideline?		
a. Single Road or Looped Road	3-28	Major HWY (97) runs through the community. Access roads on NE side of hwy have multiple access/egress points, while the roads on the SW side have only one point of access/egress
5.2 Roads- width, grade, curves, bridges and turnarounds		
a. To FireSmart Recommended Guideline?	3-30	N/A
5.4 Fire Service Access / Driveways - Grade, Width/Length, Turnarounds		
a. To FireSmart Recommended Guideline?	3-30	N/A
5.5 Street Signs / House Numbers		
a. To FireSmart Recommended Guideline?	3-30	N/A
6. Fire Suppression - Water Supply, Fire Service, Homeowner Capability		
6.1 Water Supply		
a. Fire Service water supply – hydrants, static source, tender or no water supply	3-32	No hydrants seen. River/creek to the SW of the HWY would be main water source
6.2 Fire Service		
a. Fire Service < 10 minutes or > 10 minutes, no fire service	2-25	BCWS: Kamloops base (KFC) would be the primary responder for the community for wildfire– approx. 1hr and 22min - however they are also in close proximity of Lillooet base (KFC) – 1 hr. There are forward attack bases located in Cache Creek (KFC - 12min) and Clinton (Cariboo FC – 17min). Forward attack bases are only manned when the fire environment deems it necessary Community lies within a FD response area. FD would be responsible for structural fires.
6.3 Homeowners Suppression Equipment		

a. Shovel, grubbing tool, water supply, sprinklers, roof-top access ladder	3-28	Home owners are likely to have basic hand tools on hand as well as access to working machinery such as excavators

Hazard Factor	Ref	Mitigation Comments
7. Fire Ignition and Prevention – Utilities, Chimneys, Burn Barrel / Fire Pit, Ignition Potential		
7.1 Utilities		
a. To FireSmart Recommended Guideline?	2-24	N/A
7.2 Chimneys, Burn Barrel / Fire Pit		
a. To FireSmart Recommended Guideline?	2-22	N/A
7.3 Ignition Potential Provide mitigation comments on items a – d as applicable		
a. Topographic features adversely affect fire behaviour b. Elevated probability of human or natural ignitions c. Periodic exposure to extreme fire weather or winds d. Other	2-21	Wildfire behaviour is most likely going to be dictated by fuel and wind more than topographic features Human ignitions are most likely to occur from motorists passing through or burn piles from home owners. C7/O1 fuel types are susceptible to rapid drying of fuels after a rain event

General Comments

The wildfire events in 2017, 2018 and 2019 have prompted evacuation alerts and orders for the 16 Mile community and also other nearby communities (such as Cache Creek, BC). These events highlight the close relationship the community has with the wildland interface environment and the potential reality of future events.