Nakusp WUI Fuel Management–Cost Estimate Assumptions:

A detailed breakdown of the project cost estimate has been provided as part of NACFOR's Forest Enhancement Society Information Management System electronic application (Proposal ID: WR0000541). The following supplemental information is intended to clarify additional details and assumptions used to estimate project costs. Rates used to estimate costs are consistent with FESBC cost guidelines.

Typical projected work flow for Fuel Management Projects

- Planning
- Survey
- Layout (and designation of no work zones within unit)
- Assessments
- Prescription
- Access construction / reconstruction
- Treatments
- Access Deactivation
- Silviculture Survey
- Sowing/Planting – as needed to manage stocking level

Prescription Development

Detailed prescription development estimates have been included in NACFOR's application. Based on local knowledge, NACFOR assumes that the units located next to Arrow Lake may require a fairly in-depth geotechnical assessment. There are several gullies in Unit 1 which would likely result in the need for 3 separate access points. Since all units are located close to the Village of Nakusp, NACFOR assumes that additional community, stakeholder, and agency consultation will be required prior to treatment. Other assumptions used to determine cruise estimates include: 2 plots/hectare in units 1 and 13, and 1 plot/hectare in unit 6.

Access Construction and Deactivation

Road construction estimates were based on local expertise, previous field assessments, and a review of satellite imagery of the proposed treatment sites. There are several gullies in Unit 1 which would likely result in the need for 3 separate access points. Estimates assume:

Road Construction, including Road Upgrades: 2.2km low grade road
Planned Road Construction: 1.8km
Road Deactivation: 1.8 km semi-permanent. Deactivation will likely be to a semi-permanent standard so that windthrow can be monitored, and for post treatment activities, future re-treatment, and fire suppression access. Drainage structures will be retained.

Fuel Treatment

A detailed breakdown of estimated fuel treatment costs and initial site assessments has been provided as an attachment to NACFOR's application. Estimates were determined based on previously completed site assessments, past fuel treatment costs, and current industry rates. Assumptions in these estimates include:

Total Treatment Area: 43.5ha – of which we assume 35ha will be treatable/require treatment (considering inoperable, riparian, no work areas).
Predicted Treatment Types: Shaded fuel break, possible commercial harvest (portion of unit 1)
Percent Mechanical: 75% (26ha)
Percent Hand: 25% (9ha)
Estimated volume harvested: 3,000m^3
Estimated revenue: $60,000
Based on assumption of $40 per m^3 average revenue for pulp and low grade sawlog material x 1500 m^3
Estimated residual fibre volume: 1,500m^3
Residual Fibre Plan: Made available on the landing for local firewood, mulched or chipped and spread on site.

The following work flow was assumed for fuel treatment activities. Units are divided into mechanical and hand work zones - with hand work zones including steeper and machine free areas.

Mechanical Treatment Areas

- Prework and machine flow layout.
- Landing and roadside decking areas determined and cleared.
- Harvester falls, delimbs and cuts to length (CTL) target stems with some sorting into:
    - Sawlog – sound logs down to traditional utilization specs
    - Pulp – other logs down to 0" top where possible.
- Forwarder sorts sawlogs a bit more by species and destination and takes to roadside or landing. (Harvester and Forwarder are more or less matched for productive capacity)
- Log loader does final sorting at roadside/landing and loads logs onto short log trucks. Log loader has higher capacity than other machines, therefore for efficiency, work is batched up (log decks are built by forwarder and loaded out all at once by loader). Loader also cleans up and piles remaining debris along roadside.
- Pruning crew prunes stand where needed. (Hand treatment)
- Excavator (EX120 size probably ideal to work through residual stand) with rake or grapple goes through logged stand and piles or scatters residual branches, chunks etc – some or most areas may be good enough as is depending on the original stand composition, amount of deadfall, ladder fuel, obstacles.
- If remaining organic material is gathered or piled rather than scattered, burning or chipping will be needed. Might be possible to drag a chipper unit around with the excavator and feed it with the excavator, or with a mini excavator (EX35 or EX50 size).

Hand Treatment Areas

It is assumed that hand treatment is confined to ground that is inoperable to machine traffic. Areas could be too steep, broken, or designated machine free at the prescription stage.

It will be very difficult to recover/utilize thinned trees when using hand treatment. Some may have to be piled and burnt, preferably chipped in cases where a chipper can be brought within a reasonable distance.

Density management in hand treatment areas: residual stand may be prescribed at a higher density if adjacent mechanical treatment areas are a lower density- acting as a partial fuel break. This would save effort and cost in the hand treatment areas.

Typical steps:

- Thinning with powersaw and cutting to lengths that can be handled.
- Hand Piling of thinnings.
- Pruning and additional piling of branches.
- Chipping/spreading residual fibre (if possible).
- Burning – most often later during a burning window.

Silviculture Obligations

Summary: A siviculture obligation will be created for areas within TFL 23. It is undetermined if there will be an obligation on unallocated Crown Land. Prescriptions will attempt to satisfy obligations by meeting multi-layered or fire management stocking standards in TFL 23, and ensuring sufficient retention in treatment areas on unallocated crown land.

NACFOR has been in contact with FLNRORD regarding potential silviculture obligations resulting from treatments on unallocated crown land. FLNRORD has advised that there may be an obligation, however this will depend on the authority/tenure required to conduct the treatments**.**

NACFOR will continue to work with FLNRORD and Interfor to determine the required authority to conduct treatments - which will occur once prescriptions have been developed. At the moment, without a prescription, NACFOR assumes that they will require a Forestry Licence to Cut (Fuel Reduction). NACFOR will continue to work with FLNRORD to determine if there will be a silviculture obligation and who will hold the obligation as a result of the proposed treatments on unallocated crown land. As mentioned, during the prescription development, NACFOR will attempt to satisfy obligations by meeting multi-layered or fire management stocking standards in TFL 23, and ensuring sufficient retention in treatment areas on unallocated crown land. If required, NACFOR recognizes that any planting post fuel reduction treatment should strongly consider the implications on potential fire behaviour. If reforestation is required, NACFOR intends to utilize Fire Management Stocking Standards and follow Fire Management Stocking Standards Guidance Document, V1 February 2016.

Landscape Level Wildfire Pre-Planning

Landscape Level Wildfire Pre-Planning cost estimates are based off NACFOR's recent experience developing a CWPP for the RDCK Area K and Village of Nakusp. NACFOR understands that creating a comprehensive landscape level plan is a large undertaking. In order to initiate this process, a relevant work plan will set project goals and objectives, define fire risk assessment methods, identify potential partners, and estimate project costs and timelines. NACFOR assumes that there will be costs associated with investigating, evaluating, and determining the best practices and methods to develop a landscape level wildfire plan. Possible methods NACFOR will explore include fuel hazard assessments, spatial data analysis, satellite imagery, and fire behaviour modeling. Developing a comprehensive work plan will require research and report writing, and consultation with the BCWS, FLNRORD, and other agencies/experts. Consultation may also be required with woodlot owners, licencees, and the public.