

Minutes of Meeting		
Location: St. Eugene Mission Resort Chief David Room	Date: July 12, 2017	Time: 8:30 a.m. – 4:00 p.m.
Purpose: First 2017 Biannual Meeting	Version: Final	
Attendees: See attached	Issue date: November 1, 2017	

The meeting began shortly after 10:00 am

Introductory Remarks

Simon provided a general welcome and gave information regarding exits and restrooms.

Vickie Thomas, new to the Steering Committee (SC), delivered a welcome from the Ktunaxa Nation.

Lee-Anne Walker provided the safety share. She took the opportunity to display the waterproof Elk River Map and Guide that was developed by Elk River watershed Alliance, with support from sponsors. It provides valuable information and safety features such as river access, white water classification, fishing regulations and fish handling and more.

Simon introduced the SC members identifying those on the Executive. He then went around the room having everyone introduce themselves.

Communities of Interest Advisory Initiative (COIAI) Update – Simon Howse

Childcare – BC Rural Dividends Fund request approved to hire someone to prepare Elk Valley childcare resources. See hard copy brochure. Also on website: www.evcnp.com including a simplified roadmap for hiring a nanny. Phoebe Scotland, who managed our childcare survey, was contracted to complete the childcare resource project

Closure Task Group – under umbrella of COIAI with Simon being the representative

Health Care Task Group – a task group was formed from SC members including Lois Halko, Janice Talarico, Kerri Wall, Anita Palmer and Sharon Strom to review what health care, or issues that may affect health care, should be a focus of the COIAI's focus. It was decided that looking into poverty in the region will be valuable as it is more prevalent than most realize. Kerri provided the task force with many resources for review before deciding next steps

Safety – Don Crawford (in attendance) met with Sharon to offer to share his knowledge gathered over the years about traffic safety. He will support Scott Robinson in this respect. Scott will be providing more material for the Community Safety page of the website such as links to relevant material for public consumption.

Website and Advisory Initiative promotion - Simon and Sharon met to develop a plan to make public more aware of the Initiative and the website. Claris Media has agreed to help with this project.

Teck in Review (see attached presentation) – Norm Fraser

In the absence of Nic Milligan, Manager Social Responsibility, Norm Fraser, Leader Aboriginal Initiatives, provided a Teck update which included long-term strategies, project updates, debt reduction efforts, the sale of Teck's 2/3's interest in the Waneta Dam project and the Coal Business Unit's 5-year plan to sustain 27 million tonnes of production annually. See the attached presentation for more information.

Mayor Giuliano said she heard a rumour that Teck was for sale. She asked Norm if he could confirm that. Norm said he wasn't aware of any intentions to sell Teck. He added that there are many things he isn't privy to but he feels it is unlikely that the rumour is true.

Feedback Mechanism/ Other – Sharon Strom

Sharon review feedback received in Q1/Q2 2017

Q1 – 3 concerns regarding dust on houses and/or property (2 from Sparwood Heights residents/1 from Lower EV Road resident)

Q2 – complaints from 5 Sparwood and area residents regarding bird deterrent cannons at EVO. The process is required by the Migratory Birds Act. The equipment that was used, successful in most scenarios, did not work well in a mountainous landscape. It was quickly replaced and the issues were resolved.

Last week – Extended hot, dry and windy conditions created particularly challenging conditions at Erickson spoil at EVO. Unfortunately, at the same time, there were technical issues that had a number of water trucks down. They were running again by Thursday.

The Plant was shut down on Wednesday to repair the dryer that was emitting a brown plume.

Sharon pointed out that there was a recent Elk Valley Water Quality Plan (EVWQP) update brochure print that was displayed in poster board form and explained at a number of area markets. It is also available online.

It was planned to have a presentation at the meeting on the Westslope Cutthroat Trout Study update but the presenters were not available. This topic will be put on the agenda for the December Partners meeting.

Sharon attended a two-day conference in Kelowna in June that was called Keeping it Rural. The focus was on Asset Based Community Development. She found the presenters and their case studies interesting and inspiring.

FireSmart, Community Wildfire Protection (see attached presentation) – Alan Westhaver

Alan Westhaver, Principal of ForestWise Environmental Consulting Ltd., provided an overview of the FireSmart program with the following objectives:

- to outline some basics of wildland fire and the wildland/urban interface
- to summarize lessons learned from past disasters and research
- to provide perspectives on preparing for wildfires and reducing losses
- to leave a positive message for making neighbourhoods more resilient to wildfire - we are not helpless victims

Alan shared that there will be a 3-hour FireSmart Community Champions workshop at the Fernie Senior Centre July 13, 2017 at 6:30 pm and invited interested parties to attend.

Bev underlined the need to work together to save small communities. She asked Alan about the benefit of digging trenches around communities as was past practice for some First Nations communities. Alan said simple trenches and fireguards do little to stop fires because it is the embers that are a problem.

Lois heard that homes should be devoid of all vegetation for a distance of 10 m around. Alan clarified that 1.5 m of non-flammable vegetation is sufficient, allowing for flowers and vegetable gardens but people need to choose the vegetation wisely.

Lunch/Tour

The attendees were split into two groups with one having lunch and networking while the other toured the Ktunaxa Interpretive Centre. The groups switched places when the first tour was over.

St. Eugene Mission Overview – Vickie Thomas

Vickie Thomas, Agreements Coordinator with the Ktunaxa Nation Council provided some background information around the development of the St. Eugene Mission (SEM) Resort and Casino. She identified the amenities including: lodging, golf course, restaurants and a casino. She was pleased to share that a new general store just opened up down the road and she invited people to stop in. For more information on the Resort visit website: www.steugene.ca. For more information on the Ktunaxa Nation visit website: www.ktunaxa.org.

Project Heavy Duty (see attached presentation) – Jeff McKay

Jeff McKay, Occupational Safety Officer with WorkSafeBC, described the annual Project Heavy Duty program that alternates between Cranbrook and Sparwood. The program is a partnership between SD#5, College of the Rockies, WorkSafeBC and local businesses, including Teck when held in Sparwood.

The program has been in place for a number of years and each session provides an opportunity for 24 high school students to learn safe equipment operation and to obtain valuable certificates that will help build their resumes.

Steering Committee 2017/2018 – Sharon Strom

Sharon Strom reviewed the matrix nomination process with the attendees. She confirmed that all current SC members will let their names stand. No additional nominations had been put forward by email. When asked if there were nominations from the floor, Bev Bellina said she would like the opportunity to sit on the SC to represent education. Because the matrix is set up to have representation from numerous communities of interest while providing close to equal representation from the area communities, it was pre-determined that Anita Palmer will continue to represent education. Otherwise, Sparwood representation would be too heavy. A ballot wasn't necessary.

Closing Remarks

Simon asked everyone, as is tradition at these meetings, to share a comment regarding the meeting and its presentations:

- Kerri – noted the initiative is an important one and that it was very nice to hear the Ktunaxa language spoken by Vickie.
- Lance – thanked the First Nations for hosting the meeting. He enjoys coming to the meetings and taking away the learnings that come out.
- Vickie – thanked the attendees for their kindness in welcoming her to her role on the Steering Committee. She noted that the Ktunaxa have a presence in the Elk Valley and that she looks forward to helping with initiatives. She was particularly interested in Project Heavy Duty.
- Sharon – stated that, as always, she was pleased with the attendance and level of participation and thanked everyone for coming.
- Lois – enjoyed all of the presentations and found them to be very informative. She added that she provided public health services from 1969 for 30 years. She is pleased to be an active part of the committee. Lois thanked everyone for the great day.
- Shar – thanked Sharon for the invitation and Vickie for the welcome. She found the topics to be relevant and informative. She really enjoyed the tour of the Interpretive and appreciated the emotional video.
- Terry M – thanked everyone. She challenged the group to go to the KNC language app and learn a word or phrase for the next meeting.
- Mary – noted that she didn't expect to receive so much information at this meeting. It isn't that she found previous meeting boring but this one was especially enjoyable.
- Gordon – found the FireSmart presentation to be very relevant and close to home. The Project Heavy Duty presentation was very good also.
- Murray – enjoyed the presenters and their presentations. The FireSmart presentation was very helpful. He appreciated the tour of the Interpretive Centre. It is a very important piece of history. He thanked Vickie and Sharon.
- Terry A – thanked his First Nation cousins for hosting the meeting. It was his second time watching the video in the Interpretive Centre and he still found himself getting emotional. He agreed with Murray that it is a very important part of history. He looks forward to working with Vickie in the future.
- Denise – enjoyed the FireSmart presentation very much. She wants to attend the FireSmart Community Champions workshop in Fernie tomorrow and provide positive feedback regarding Alan's presentation today. She noted that the Steering Committee work well together and pursue the interests for all rather self-serving interests.
- Anita – shared that Vickie knew her late mother who used to work at XXXXXXX. She welcomed Vickie. Anita confirmed that she does not like sitting on committees that 'spin there tires'. With this committee, if something comes up as an action, it is accomplished. That makes her very happy.
- Kim – has enjoyed her involvement with the Communities of Interest Advisory Initiative (COIAI) and the Elk Valley Child Care Advisory Initiative (EVCCAI) working with Anita and Sharon. She find them to be more productive than the many other committees meetings she has attended. The Interpretive Centre was very educational.

- Lee-Anne – thanked the KNC for hosting the meeting and she values Vickie’s involvement. The FireSmart presentation was very informative and suggested there could be a similar program called FloodSmart. She appreciated the Teck update from Norm.
- Bev – really enjoyed the meeting as she has past meetings. The tour of the Interpretive Centre was very impactful and important to reconciliation. School District #5 signed an agreement with Aboriginal peoples for mutual collaboration which makes her feel good after seeing the anger and frustration on Parliament Hill.
- Nevione – particularly enjoyed the FireSmart presentation as it is very timely.
- Don – thanked the Nation for having everyone here. He learned very much and experienced meeting a wide group of people. He thanked the Steering Committee for the invitation.
- Shelley – has been coming to St. Eugene Mission for many years and she has always felt very welcome for which she is very thankful to the KNC. She was interested in the FireSmart program and will take a closer look at it.
- Christina – enjoyed all of the presentations but especially the Project Heavy Duty. It provides a shift in perspective before exploring a career in mining.
- Janice – thanked St. Eugene Mission for hosting this meeting. As it was her first time visiting the Interpretive Centre, she thanked Sharon for making the arrangements. There was a lot of relevant information to take away from the meeting. It is good to get the Teck updates with a clear explanation directly from a representative.

Meeting ended at 2:30 p.m.

Next Meeting of the Partners will December 2017

Next Steering Committee meeting will be September 2017

July 12, 2017 Advisory Partners Meeting Attendance

Name	Representing	Email
Anonson, Terry	Aboriginals/Metis/Elkford	terryanonson@elkvalley.net
Bauer, Kim	Social Programs/Elkford	ewtf@telus.net
Bellina, Bev	SD5	bellina@telus.net
Bertrand, Denise	District of Elkford	dbertrand@elkford.ca
Bilski, Christina	Interior Health	christina.bilski@interiorhealth.ca
Brightwell, Gerri	Ministry Jobs, Tourism, Skills	gerri.brightwell@gov.bc.ca
Cartwright, Shar	Municipality of the CNP	shar@communityfuturescnp.ca
Crawford, Don	Sparwood	donnydollar@hotmail.com
Crawford, Nevione	Sparwood	
Fraser, Norm	Teck	norman.fraser@teck.com
Galloway, Gordon	Motorized Rec	gmoose@telus.net
Giuliano, Mayor Mary	City of Fernie	mary.giuliano@fernie.ca
Haight, Murray	Elkford ATV Club	elkman2@shaw.ca
Halko, Lois	Government	lhalko@sparwood.ca
Howse, Simon	Business/Housing	showse@parastone.ca
McInnis, Norm	City of Fernie	norm.mcinnis@fernie.ca
McKay, Jeff	WorkSafe BC	jeff.mckay@worksafebc.ca
Melcer, Terry	District of Sparwood	tmelcer@sparwood.ca
Palmer, Anita	Education	apalmer@cotr.bc.ca
Ruiter, Ted	City of Fernie	ted.ruiter@fernie.bc
Steinke, Lance	Crowsnest Pass	lance.steinke@amecfw.com
Strom, Sharon	Teck Community Affairs	sharon.strom@teck.com
Talarico, Janice	Interior Health	janice.talarico@interiorhealth.ca
Thomas, Vickie	First Nations/Cranbrook	vthomas@ktunaxa.org
Walker, Lee-Anne	ENGO/Elk River Alliance	lee-anne@elkriveralliance.ca
Wall, Kerri	Interior Health	kerri.wall@interiorhealth.ca
Wedderburn, Shelley	Michel Creek Rd Residents	shelley1226001@msn.com
Westhaver, Alan	ForestWise Envir Consulting	alan.westhaver@shaw.ca

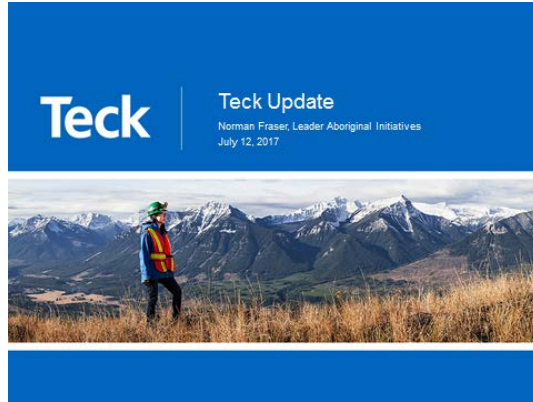
Unable to attend:

Name	Representing	Email
Craig, Andrew	Youth/Fernie	tfaandrewc@gmail.com
Drain, Joanne	Seniors/CNP	jvdrain@shaw.ca
Mac Con, Amy	Teck Human Resources	amy.maccon@teck.com
Milligan, Nic	Teck Social Responsibility	nic.milligan@teck.com
Robinson, Scott	Community Safety/Fernie	skrpc@shaw.ca

TECK COAL ELK VALLEY COMMUNITIES OF INTEREST INITIATIVE						
STEERING COMMITTEE 2017/2018						
	Crowsnest Pass	Elkford	Sparwood	Fernie	RDEK Area A	Other
Local Government			Lois Halko			
ENGOS					Lee-Anne Walker	
Michel Creek/GN Rd Resident			Shelley Wedderburn			
Youth				Andrew Craig		
Seniors	Joanne Drain					
Business				Simon Howse		
Education					Anita Palmer	
Health Care			Janice Talarico	(Kerri Wall)		
Social Services		Kim Bauer				
Community Safety			(Don Crawford)	Scott Robinson		
Recreation Users		Gordon Galloway				
Aboriginal		Terry Anonson				Vickie Thomas
Teck Communities			Sharon Strom			
Teck Human Resources				Amy Mac Con		
Other	Lance Steinke					

Teck Presentation

Slides 1 & 2

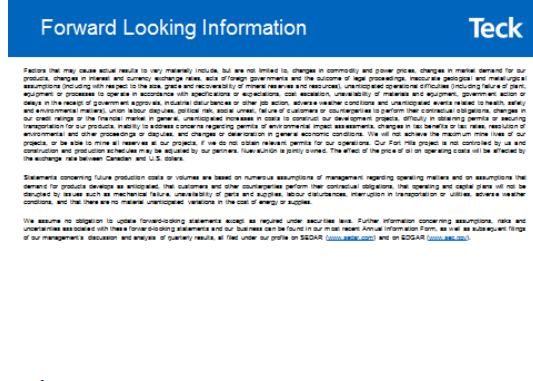


Forward Looking Information Teck

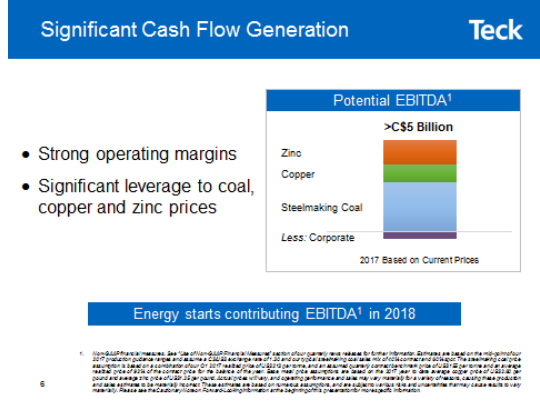
Both these slides and the accompanying oral presentation contain certain forward-looking statements within the meaning of the United States Private Securities Litigation Reform Act of 1995 and forward-looking information within the meaning of the Securities Act (Canada) (collectively referred to herein as forward-looking statements). Forward-looking statements involve known and unknown risks, uncertainties and other factors which may cause the actual results, performance or achievement of Teck to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements. These forward-looking statements include statements relating to our long-term strategies and goals, the long-life of our assets and estimated reserves, the possibility that we will have a longer resource life in some very rich, our production guidance, estimated profits and estimated EBITDA and the availability of estimated profits and estimated EBITDA to fund exploration and development costs, the statement that the proposed zinc mine could translate into hundreds of millions of additional EBITDA in the year and a number of years going forward, estimated future cash flow and cash flow potential, our expectations regarding market supply, demand and price in the commodities we produce, including our expectations regarding factors which may impact supply or demand in key markets, the expected timing and amount of production at the Fort Mills site and production at the oil price environments will be based on our cost of production, potential EBITDA, potential of exploration and development, our statement that the Cuddeback Branch 2 is a potential Tier 1 asset, the statements made regarding the potential mine life, metal costs, mine life extension and expansion options and production for our Cuddeback Branch 2 project, our statements regarding our Seabee Project, including statements regarding the value, mine life and potential of these projects, the statement that deep reclamation remains a priority, issues to value reclamation, our statements regarding the sustainability of our collaborative program, statements regarding the Dog resource potential, 2017 production guidance and cost guidance, 2017 capital expenditure guidance, our production guidance, our statements regarding potential zinc mine, statements relating to the Year One First Success 2018/2019 Term, zinc, our statements regarding potential increases in port capacity, expansion of future copper projects, all production for our Cuddeback Branch 2 project, including those on the site titled 'Cuddeback Branch 2 Conversion' and '2022 Final Economic Feasibility Study', all production for the Seabee Project, including those on the 'Seabee Project: Quality Steel (Lead Asset)', zinc, production regarding zinc supply and demand, Fort Mills project, including a shift in the Fort Mills production and other statements regarding the Fort Mills project, including those made on the 'The Steel Value of Long Life Assets', zinc, transportation capacity and our ability to secure transport for our Fort Mills production, statements regarding our sustainability goals, and management's expectations with respect to production, demand and outlook regarding steel, copper, zinc and energy.

These forward-looking statements involve numerous assumptions, risks and uncertainties and actual results may vary materially, which are described in Teck's public filings available on SEDAR (www.sedar.com) and OSCAR (www.oscar.ca). In addition, the forward-looking statements in these slides and accompanying oral presentation are based on assumptions regarding, but not limited to, general business and economic conditions, the supply and demand for, delivery of, and the use and availability of prices of zinc, copper and coal and other primary metals and minerals as well as oil, and related products, the timing of the receipt of regulatory and government approvals for our development projects and other operations, our costs of production and production and productivity, mine life, as well as those of our competitors, power costs, continuing availability of water and power resources for our operations, market competition, the accuracy of our reserve estimates (including with respect to base, grade and reserve estimates) and geological, geochemical and other assumptions on which these are based, conditions in financial markets, the future financial performance of the company, our ability to attract and retain skilled staff, our ability to procure equipment and operating supplies, plant life from the outset of our expansion projects, our cost and other production estimates, our ability to secure adequate transportation for our products, our ability to obtain permits for our operations and expansions, our ongoing relations with our employees and business partners and joint ventures, Reserve and resource life estimates assume the mine life of long-life reserves in the relevant commodity and reserves production at current rates and assume that all resources identified in the statements are developed. Certain forward-looking statements are based on assumptions of increases in the relevant mine life. Our estimated profit and EBITDA, EBITDA, EBITDA sensitivity, estimates are based on the commodity price and currency exchange assumptions stated on the relevant slide. Cash estimates are based on assumptions stated in the relevant slide. Assumptions regarding Fort Mills also include the assumption that project development and funding proceed as planned, as well as assumptions noted in the relevant slide regarding Fort Mills. Assumptions regarding our potential reserve and resource life assume that all resources we categorize as reserves and that all reserves and resources should be mined. The foregoing list of assumptions is not exhaustive.

Slides 3 & 4



Slides 5 & 6



Slides 7 & 8

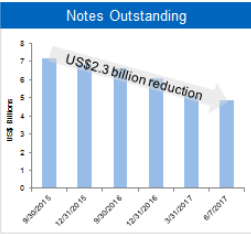
Fort Hills Project Status & Progress **Teck**



- Construction >83% complete
- 4 of 6 areas turned over to Operations
- >60% operations personnel hired
- First oil end of 2017

Achieved Significant Debt Reduction **Teck**

Current Debt Portfolio ¹	
Public notes outstanding	US\$4.9B
Average coupon	5.7%
Weighted average term to maturity	~15 years
Debt to debt-plus-equity ratio ²	~27%
Undrawn credit facility	US\$3.0B



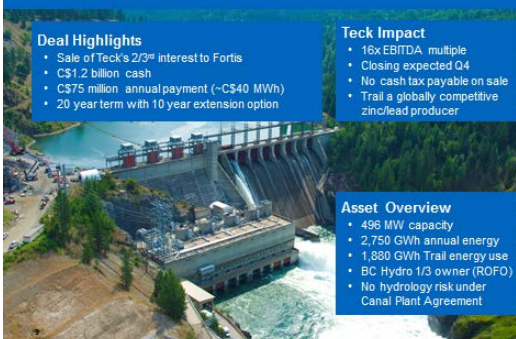
Notes Outstanding

US\$2.3 billion reduction

Redeemed US\$214M of outstanding public notes on June 7, 2017

Slides 9 & 10

Waneta Transaction **Teck**



Deal Highlights

- Sale of Teck's 2/3rd interest to Fortis
- C\$1.2 billion cash
- C\$75 million annual payment (~C\$40 MWh)
- 20 year term with 10 year extension option


Teck Impact

- 16x EBITDA multiple
- Closing expected Q4
- No cash tax payable on sale
- Trail a globally competitive zinc/lead producer

Asset Overview

- 496 MW capacity
- 2,750 GWh annual energy
- 1,830 GWh Trail energy use
- BC Hydro 1/3 owner (ROFO)
- No hydrology risk under Canal Plant Agreement

Returning Cash to Shareholders **Teck**



- Increased the dividend
 - Annualized dividend of \$0.20/share
 - Payment quarterly
- Shift in dividend policy to align with cyclical nature of our business
 - Variable component, at the Board's discretion

Slides 11 & 12

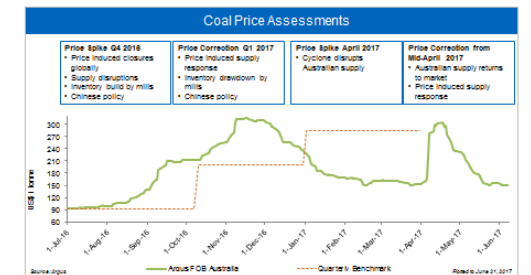
High Grade Hard Coking Coal Is A Niche Market **Teck**



Global Coal Production¹: 7.9 billion tonnes
 Steelmaking Coal Production²: ~1,185 million tonnes
 Export Steelmaking Coal²: ~325 million tonnes
 Seaborne Steelmaking Coal²: ~290 million tonnes

Our Market - Seaborne Hard Coking Coal²: ~200 Million Tonnes

Steelmaking Coal Price Normalizing? **Teck**

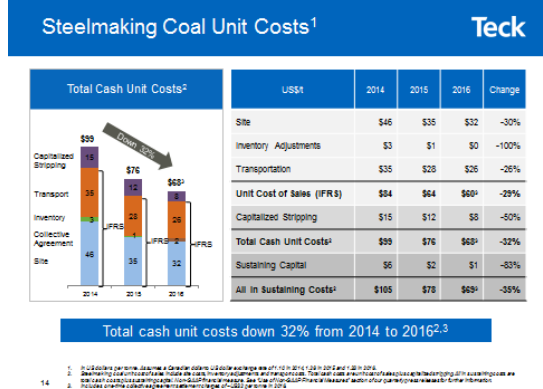


Coal Price Assessments

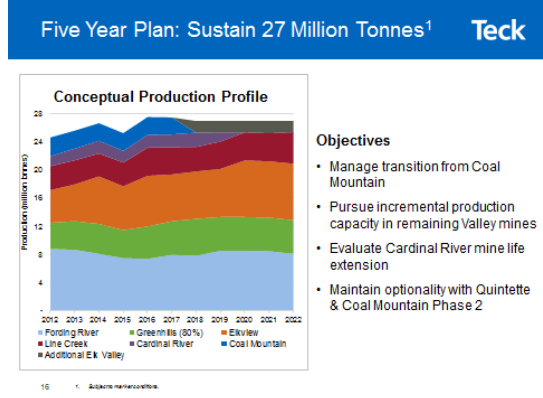
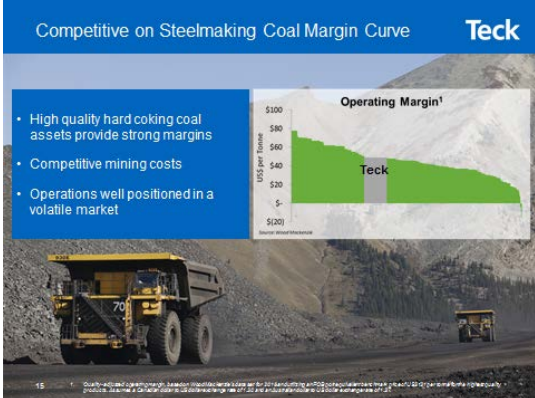
Price Spike Q4 2016	Price Correction Q1 2017	Price Spike April 2017	Price Correction from Mid-April 2017
<ul style="list-style-type: none"> • Price induced closures globally • Supply disruptions • Inventory build by mills • Chinese policy 	<ul style="list-style-type: none"> • Price induced supply response • Inventory drawdown by mills • Chinese policy 	<ul style="list-style-type: none"> • Price induced supply response • Cyclone disrupts Australian supply 	<ul style="list-style-type: none"> • Australian supply returns to market • Price induced supply response

Prices driven >US\$300 for the fourth time since 2008

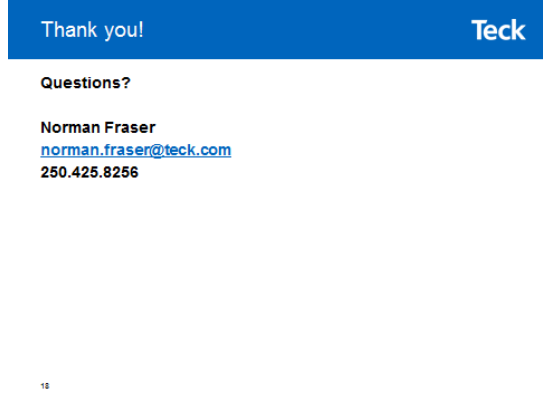
Slides 13 & 14



Slides 15 & 16



Slides 17 & 18



Slides 1 & 2

July 12, 2017

Protecting Communities from Wildfire

Teck Coal: Communities of Interest Advisory Initiative

Alan Westhaver, ForestWise Environmental Consulting Ltd. Fernie, BC

Who's he... and Why is he Here?




- Career
- Wildland fire experience
- Community protection
- FireSmart involvement
- Retirement/Research
- Education

Alan Westhaver
 ForestWise Environmental Consulting Ltd.
 Fernie, BC.
 (250) 423-4818
 alan.westhaver@shaw.ca

ForestWise Environmental Consulting Ltd.

Slides 3 & 4

Presentation Objectives




- Outline some **basics** of wildland fire and the wildland/urban interface
- Summarize **lessons learned** from past disasters and research.
- Provide **perspectives on preparing** for wildfires and reducing losses.
- Leave a **positive message** for making neighbourhoods more resilient to wildfire. We are not helpless victims.

ForestWise Environmental Consulting Ltd.

Wildland Fire

- Fires burning in native vegetation: grass, brush, forest
- Behavior regulated by the fire environment
- Essential ecosystem process
- Less fire means more fuel



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Slides 5 & 6

What is the Wildland/Urban Interface ?

"The presence of structures in locations where conditions result in the potential for their ignition from flames and **firebrands*** of a wildland fire."

* **A.K.A. embers**

Where forest meets homes?



WUI

ForestWise Environmental Consulting Ltd.

A wildland fire becomes a wildland/urban interface fire when...

... the fuel being consumed by fire begins to include structural fuel



wildland/urban interface fire


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Slides 7 & 8

It's no Ordinary Fire!

WUI Fire Disaster Characteristics


- Short notice
- Rapid fire spread
- Many structures ignited at once
- Extreme risk:
 - To citizens
 - To fire fighters
- Evacuation, smoke, emotion
- Extraordinary potential for losses and cost



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Is WUI Fire a New Issue? NO!

1908: Fernie, B.C. 5,000 homeless - 9+ killed.



"To many other parts throughout the province, Fernie will contain a lesson in this respect."

Wm. Fernie, Town Founder, Sept. 1908

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Slides 9 & 10

What's in the Future ?

3 Converging Trends

Climate Warming
 >> increased fire danger/
 # fires/ fire intensity/
 area burned

More Development in WUI Areas

Forest Health Issues
 >> rising fuel loads

Lack of FireSmart mitigations


Response Frequently Overwhelmed

WUI Disaster

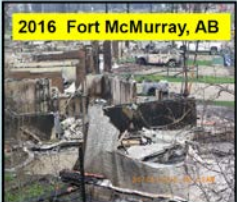
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A lot has changed in 108 years.....

1908, Fernie, BC



2016 Fort McMurray, AB



... but the outcomes are similar!

- Technology → Fire fighting capability
- Equipment → Response times
- Construction → Building codes and materials
- Science → Knowledge of fire behavior

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Slides 11 & 12

An Escalating pattern of losses...

▶ Kelowna, BC	2003	▶	\$250 million
▶ Slave Lake, AB	2011	▶	\$1 billion
▶ Fort, McMurray, AB	2016	▶	3.7 – 11.0 billion



Kelowna, BC

←



Slave Lake, AB

←

ForestWise Environmental Consulting Ltd

Lessons learned?

During severe WUI fires hundreds of structures an hour may be ignited.




Kelowna BC, 2003

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Slides 13 & 14

Lessons learned?



Total destruction is the rule...
Rare for partial home losses to occur...

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Lessons learned?




85 to 90% of homes without flammable roofs and 10 metres of clearance will survive a major wildfire*.
(*Research from multiple fires in USA/Australia).

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Slides 15 & 16

Lessons Learned?



Destructive wildfire does not 'explode' or 'surge' through a WUI area.

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Lessons Learned?




Fire doesn't spread like a flood, landslide or avalanche. It is not a destructive mass swallowing homes in its path.

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Slides 17 & 18

Lessons Learned?



Fire spreads only into and onto locations with fuels that support combustion – including homes.

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Lessons learned?



- Home ignitions not always due to big flames and massive radiant heat of the nearby wildland fire.
- 20 – 30m of clearance is usually enough.

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Slides 19 & 20

Lessons learned?



More than 50% of homes destroyed by wildfires are ignited by embers ... 80+ %

Ember Characteristics:

- Vast numbers
- Travel far : lofted by wind
- Excellent igniters



Lessons Learned?

Without appropriate pre-fire mitigation:

FIRE CONTROL EFFORTS ARE FREQUENTLY OVERWHELMED

Is more fire control the answer?





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Slides 21 & 22

Why are Fire Control Resources Overwhelmed?

- Conditions are extreme (wind, heat, visibility).
- Too many homes ignite too fast, to respond (even from a few blocks away).
- Responding is often not safe – life threatening to fire

...and more fire trucks are NOT the answer.

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Slides 23 & 24

More Recent Research




Why some homes survived: Learning from the Fort McMurray wildfire disaster
 Alan Westhaver, M.Sc.
 ForestWise Environmental Consulting Ltd.




Institute for Catastrophic Loss Reduction

ForestWise Environmental Consulting Ltd.

Overall ...

Results of the Fort McMurray investigation echo results of many previous U.S. and Canadian studies.



ForestWise Environmental Consulting Ltd.

Slides 25 & 26

Conclusions:



- Surviving homes (or groups of homes) were significantly less vulnerable to ember ignition than homes that were destroyed:
 - Adoption of FireSmart practices by homeowners was strongly correlated to home survival.

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Conclusions:




- Beyond doubt, recommended FireSmart Guidelines demonstrated their effectiveness; survival is not random.
 - 81% of all surviving homes assessed were rated as 'FireSmart'; ¾ of them in the 'Low' hazard category.
 - Matched pairs: 94% of the time the surviving home was rated with lower hazard than burned home by 30+ points.

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Slides 27 & 28



Conclusions:



- At the urban margins, embers ignited the vast majority of homes destroyed in Fort McMurray neighbourhoods during early stages of the disaster.
 - With very few exceptions, clearances were adequate and homes did not ignite from radiant heat or direct forest flame contact.

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Conclusions:





- The wildland/urban interface disaster sequence was replicated independently at several different locations:
 - Beacon Hill, Abasand Heights, Wood Buffalo

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Slides 29 & 30


Conclusions:



- No single risk mitigation can guarantee survival; overall compliance with guidelines is required.
- 'Achilles Heel' conditions can supersede FireSmart status to almost guarantee home ignition.
- Untreated vegetation contributed 1/2 to 2/3 of all hazard within 30m of burned homes; mostly landscaped plants.


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MYTH BUSTERS



Do some of these Lessons Learned surprise you ?

Bottom Line: Relatively small preventive actions by property owners can make a BIG difference?



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Slides 31 & 32

How can we Reduce Reliance on Fire Response and Disastrous Losses ?

Re-think:

- What we do
- When we do it
- Where we do it
- How we do it

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What: FireSmart = Principles and programs for reducing wildfire loss

Seven Disciplines of the Wildland/Urban Interface:

1. Vegetation Management
2. Land Use Planning
3. Public Education/ Communication
4. Legislation & Regulations
5. Interagency Cooperation
6. Training
7. Emergency Planning

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Slides 33 & 34

When: More Risk Reduction, Less Recovery & Re-building

- Focus on reducing losses **BEFORE** the fire starts.

- Reduce fire intensity as influenced by the surrounding vegetation.
- Reducing ignitability of the structure.

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Where: Strike at the Root of the Problem !

The issue is a matter of how vulnerable a structure is to ignition from a wildfire!

If homes don't ignite...
...homes don't burn...

If homes don't burn...
... then we do not have a disaster!

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Slides 35 & 36

Where: to Invest in Risk Reduction ?

Shift equal emphasis onto lowering wildfire risk in Home Ignition Zones, and less to landscape scale fuel modification far beyond.

Complexity and Planning Focus Differ with Scale and Land Ownership

City, County, Municipality, Region, Provincial Scale (Public Land Ownership)

Subdivision / Neighbourhood Scale (Private Ownership)

Single Homes (Private Ownership)

Rising Complexity of Hazard Assessment and Risk Mitigation

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How: The FireSmart Canada Community Recognition Program

- Knowledge and tools that empowers property owners the take actions that reduce the risk of wildfire losses in their neighbourhood.
- 8-step grassroots program triggered by a Community Champion;
- Facilitated by trained fire professionals.

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Slides 1 & 2

Project Heavy Duty




WORKING TO MAKE A DIFFERENCE
 worksafebc.com

Project Heavy Duty Spring 2017

Sparwood, BC May 29 - 31, 2017

- A partnership of School District No. 5, The College of the Rockies, WorkSafeBC, and local businesses.
- Project Heavy Duty is a great opportunity for students to learn safe equipment operation, as well as obtain some valuable certificates that will help build a resume.



Prevention Field Services of the Worker and Employer Services Division
 WorkSafeBC

Slides 3 & 4

Project Heavy Duty Spring 2017

- Project Heavy Duty will introduce 24 School District No. 5 high school students to the variety of jobs available in the construction industries.
- The students will learn the importance of safety training and receive mentoring from equipment operators as they learn through hands-on experience to operate different types of heavy machinery.



Prevention Field Services of the Worker and Employer Services Division
 WorkSafeBC

Elk Valley PHD 2013

[Heavy Machinery.mov](#)



Prevention Field Services of the Worker and Employer Services Division
 WorkSafeBC

Slides 5 & 6

Project Heavy Duty Spring 2017


- The program consists of two days of First Aid Level 1 training, WorkSafeBC Safety Orientation and a tour of Teck's Elkview Coal Operations and SMS Equipment Ltd. in Elkford.
- There will also be two days of on site heavy equipment operation at the District of Sparwood gravel pit located at Highway No. 43 and Arbutus Road north of Sparwood.



Prevention Field Services of the Worker and Employer Services Division
 WorkSafeBC

Project Heavy Duty Spring 2017

- WorkSafeBC will conduct the safety orientation for the site and provide the students with a hard hat, high-vis vest, gloves and safety glasses. Students will provide their own safety footwear.
- The College of the Rockies will provide First-Aid Training (OFA Level 1) for the students.
- The students are covered by School District No. 5's liability insurance.
- At all times, the students are under the direct supervision of machine operators.
- WorkSafeBC occupational safety officers will be on the site and provide first aid coverage.





Prevention Field Services of the Worker and Employer Services Division
 WorkSafeBC

Slides 7 & 8

Project Heavy Duty Spring 2017


- Interested students complete an application form which is reviewed by the District's school Counselors who check attendance and course history. The students are then interviewed and selected for the program.
- For further information contact:
- Sharlene Charest (Sparwood Secondary School)
250-425-6666
- Tristan Taylor (Fermie Secondary School)
250-423-4471 (ext 230)
- Erin Hay (Elkford Secondary School)
250-865-4674




Prevention Field Services of the Worker and Employee Services Division 

Project Heavy Duty

<http://vimeo.com/43007835>



Prevention Field Services of the Worker and Employee Services Division 

Slides 9 & 10

Questions?



Prevention Field Services of the Worker and Employee Services Division 

Thank You!



Prevention Field Services of the Worker and Employee Services Division 

Slides 11 & 12