ENTWISTLE PROJECT – PRESENTATION TO PARKLAND COUNTY

March 28 2017

Pinnacle.
RENEWABLE ENERGY INC.

SAFE CERTIFIED

BC EXPORT AWARDS 2013 WINNER

Agenda & Introductions

- **The purpose of today's presentation is to:**
  - **Provide overview of Pinnacle Renewable Energy**
  - **Describe the vision for a new pellet plant in Entwistle and how this aligns with Alberta's Climate Plan**
  - **Community Consultation Work**
  - **Elaborate on Pinnacle's proposed mitigation measures of identified stakeholder concerns**
    - **Air Emissions**
    - **Fugitive Dust**
    - **Noise**
    - **Light, Odor, & Water**
    - **Wetlands**
    - **Traffic**
    - **Safety & Fire Prevention**
  - **Provide overview of Regulatory Approvals & Project Timelines**
  - **Solicit feedback from Stakeholders and Council on how Pinnacle can become a valued member of the Entwistle community**

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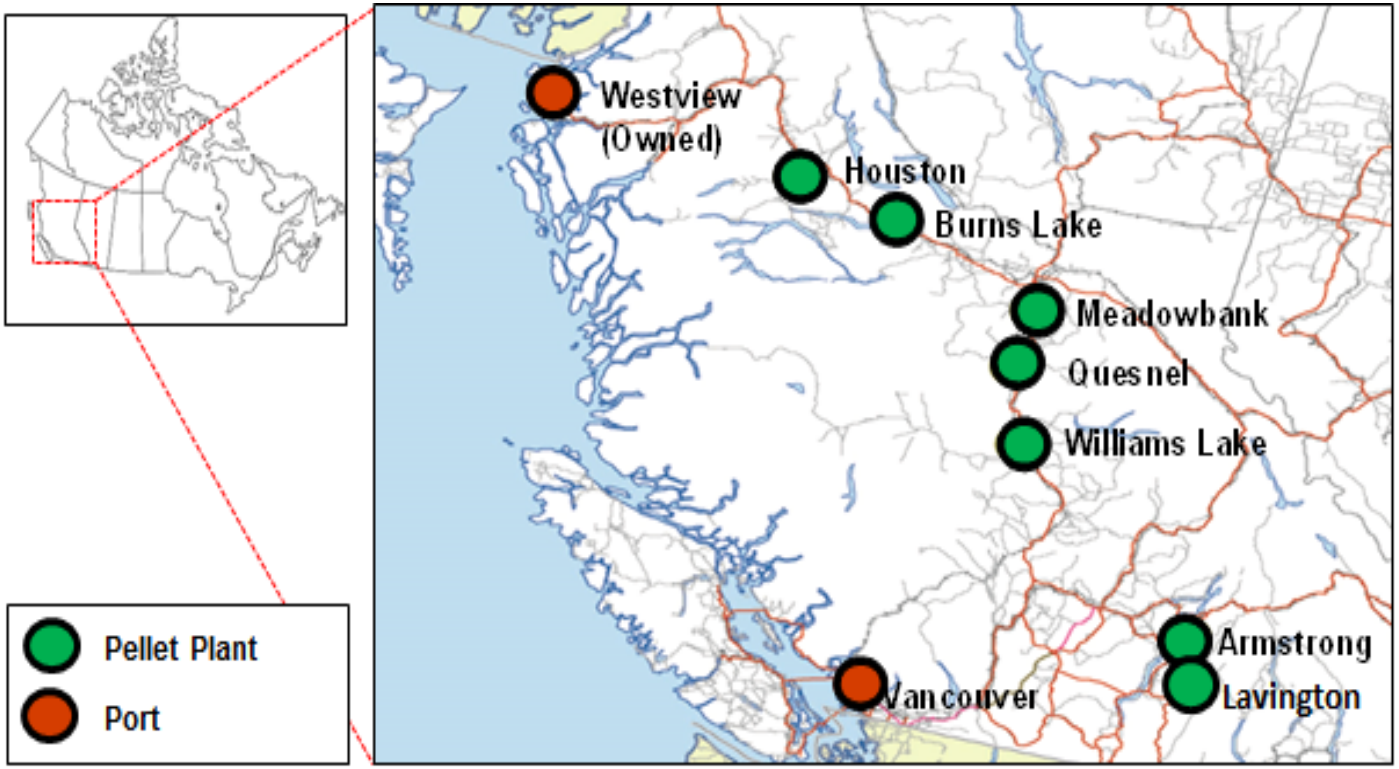
Pinnacle Introduction

- Privately held, Canadian owned company
- Largest producer of wood pellets in Canada and second largest in the world
- Operates seven production facilities in British Columbia, producing 1.5 million tonnes (~ 15,000 railcars per year)
- Own and operate a port in Prince Rupert that was specifically built to handle wood pellets
- Longstanding relationships with every major forestry company operating in BC and Alberta
- In 2016 Pinnacle was recognized by both WorkSafe BC and the BC Forest Safety Council as a leader in safety



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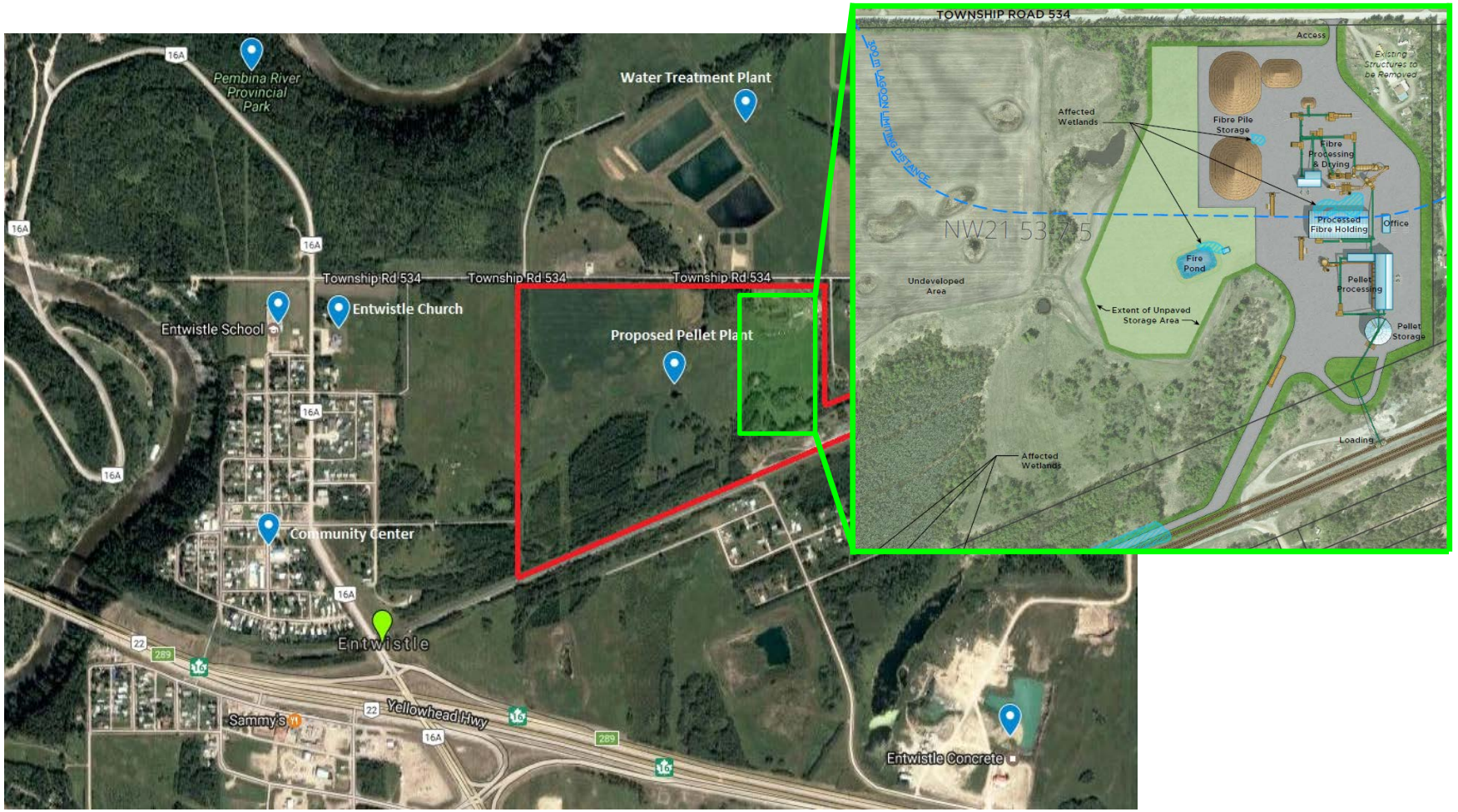
Entwistle Pellet Plant Vision

- Pinnacle is proposing to construct a wood pellet plant approximately 1 km east of downtown Entwistle
- Purchased land area would represent ~75 acres, with the physical plant occupying ~15 acres
- Plant will be built using best available technology (BAT) and Pinnacle's knowledge accumulated through 30 years of operating and plant construction experience
- Proposed construction timeline starting in April 2017 with commissioning to commence in the 4th quarter of 2017



Entwistle Pellet Plant Aligns with Alberta Climate Plan

- Alberta's wealth of energy resources comes in many forms (Natural Gas, Oil, Biomass, and other Renewables)
- A large quantity of surplus biomass is being underutilized, accumulated, and/or burnt in the region surrounding Entwistle
- Pinnacle has **secured a market** and is proposing to construct a wood pellet plant with an annual capacity of 475,000 tonnes in the vicinity of Entwistle
    - Location has been selected which creates a carbon and cost efficient link via CN's main line to Pinnacle's wholly owned port facility in Prince Rupert

Alberta Climate Action Plan Alignment

- Entwistle pellet plant project aligns with Alberta's climate action plan:
    - Captures GHGs in a renewable energy product that are currently being released in Alberta through sawmill residual stockpiling, harvest residual burning and beehives burners
    - Wood pellet energy product is utilized to displace coal consumption
    - Wood pellets from Entwistle will be delivered to established markets through Pinnacle's logistical network, but could be consumed in Alberta if the pricing of other energy products (natural gas) rise to a competitive price point
    - Wood pellet production process internally consumes biomass to produce the heat energy required in the drying process furthering the GHG benefit in Alberta versus the use of fossil fuels
    - At peak capacity, Entwistle will create a net reduction of 800,000 tonnes of CO_2 per year

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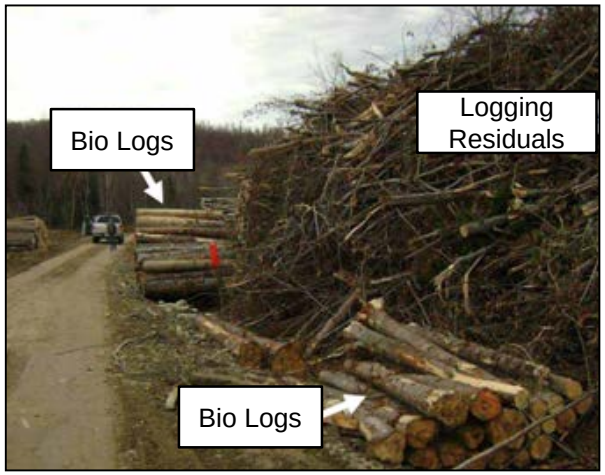
Entwistle Pellet Plant Aligns with Alberta Climate Plan – cont'd

Utilizing Fibre Residuals To Create Sustainable Green Energy

- At peak capacity, the plant will covert 475,000 ODTs of low value residual fibre into a valued renewable energy product
- Delivered residual fibre will consist of:
  - Sawmill Residuals (Sawdust, Shavings, Bark) -> Currently landfilled, stockpiled, or burned in beehive burners
  - Bush Residuals (Treetops, branches, non-economical trees) -> Currently burned in the bush

Benefits Include:

- **Reduction of GHGs (methane & CO_2) -> GHGs currently being released through stockpiling, harvest residual burning and beehive burners will be captured in a renewable energy product that displaces coal consumption**
- **Reduction of local uncontrolled burning (smog & particulate)**
- **Sustainable and environmentally alternative to coal that will displace 800,000 tonnes of CO_2 per year**



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Entwistle Pellet Plant Creates and Sustains Jobs

- **Entwistle project creates immediate investment in direct and indirect employment**
  - Immediate investment of **$85 million will include 150,000 hours of construction labour** in a region that will be negatively affected by the planned coal phase out in Alberta
  - **70 direct jobs** at the pellet plant and in trucking with benefits, competitive salaries & career development opportunities
  - Creates jobs in support services (locally sourced mechanical and electrical contracting services)
  - Creates a long-term tax base and economic activity in a region facing coal phase out related economic challenges

- **Entwistle project will sustain and support Alberta forest industry jobs** by providing a favourable economic market for the residuals generated by the harvest, sawmilling and remanufacturing operations
  - Helps to level the Alberta forest industry's playing field when compared to other regions (example: British Columbia) where bio-energy provides a similar outlet for residuals
  - Allows sawmills to operate through the tougher portions of the lumber market cycle creating certainty of forest sector employment (especially important for an industry facing Softwood Lumber related trade barriers)
  - Nearly **$20 million annually will be fed back into the local economy** through fibre purchasing & trucking activities alone

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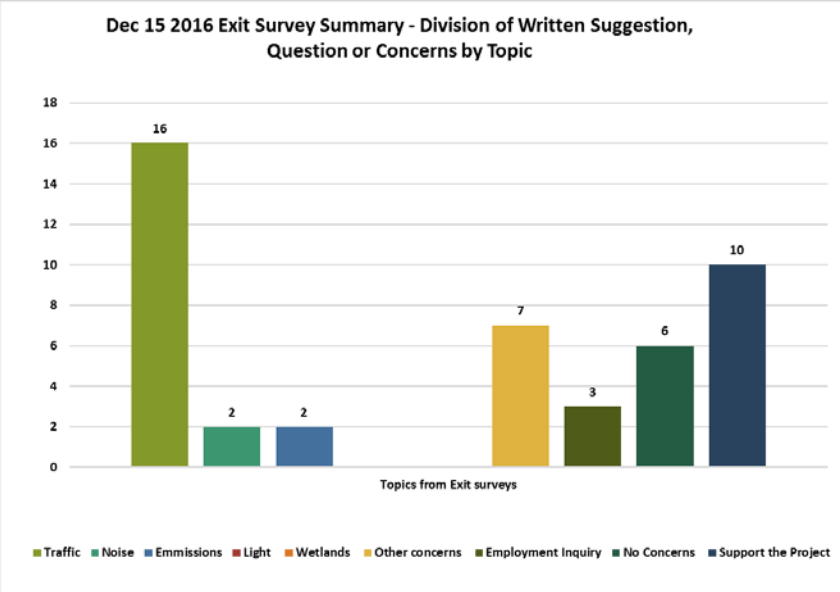
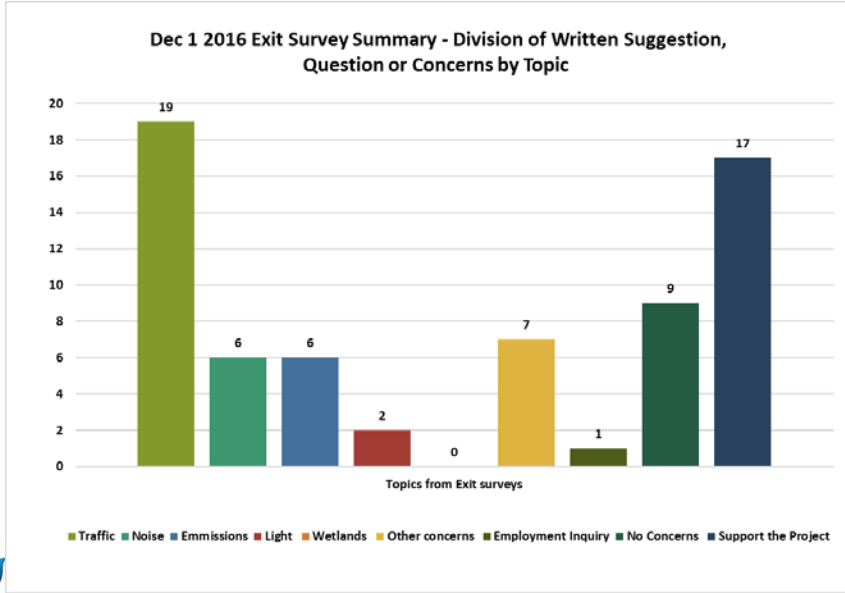
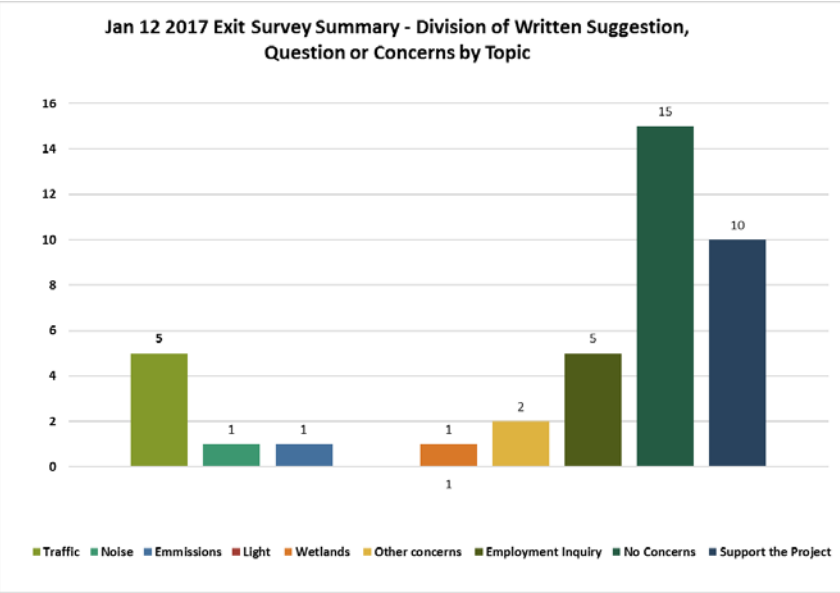
Community Consultations

Parkland County – Entwistle Public Consultation

- Pinnacle held three public information sessions (Dec 01st, Dec 15th, and Jan 12th)
- Through the process of information sharing, a transition occurred where the number of people stating that they either did not have concerns, were interested in employment, or supported the project increased
- Concerns decreased with knowledge, however the concern over traffic flow remained – solution has been developed as outlined in next slides







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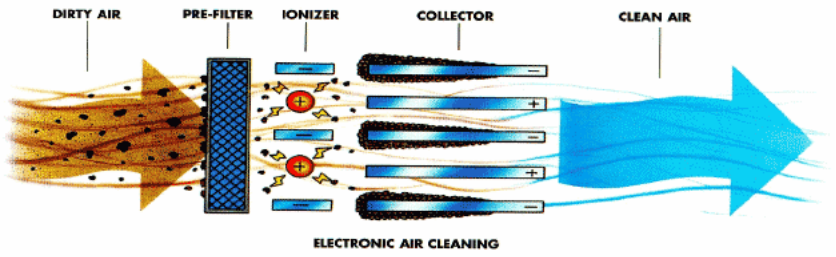
Mitigation Measures – Air Emissions

Best Available Technology

- Ambient air is required for the drying and cooling processes, and as such air emissions are inherent to the pellet facility
- Best Available Technology (BAT) will be employed at Entwistle to mitigate air emissions as much as possible
- Air will be exhausted to atmosphere at two locations:
  1. Dryer Discharge through Wet Electrostatic Precipitator (WESP)
  2. Pellet Cooler Discharge through cyclofilter

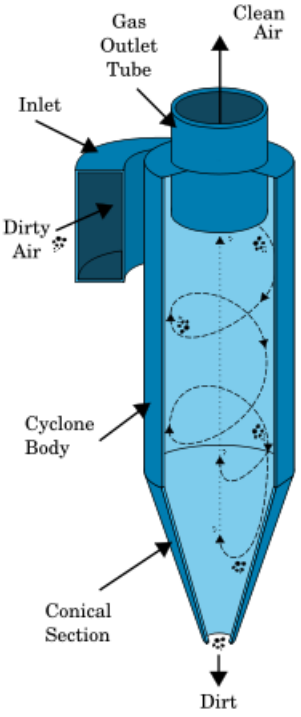


1. WESP

- WESP introduces a static charge to particulate matter which sticks to opposite charged plates
- Plates are continuously washed and particulate is separated from water in a centrifuge prior to being resent to the furnace
- Water is recycled in the process and evaporated
- Clean air exits the stack

2. Cyclofilter

- Air from pelleter coolers are introduced into the cyclofilter
- Cyclofilter operates similar to a “Dyson” vacuum where air and dust separation is achieved
- Dust falls out of suspension and is reintroduced into the pellet process
- Clean air exits the stack after passing through a tight knit bag network that removes fine suspended particulate



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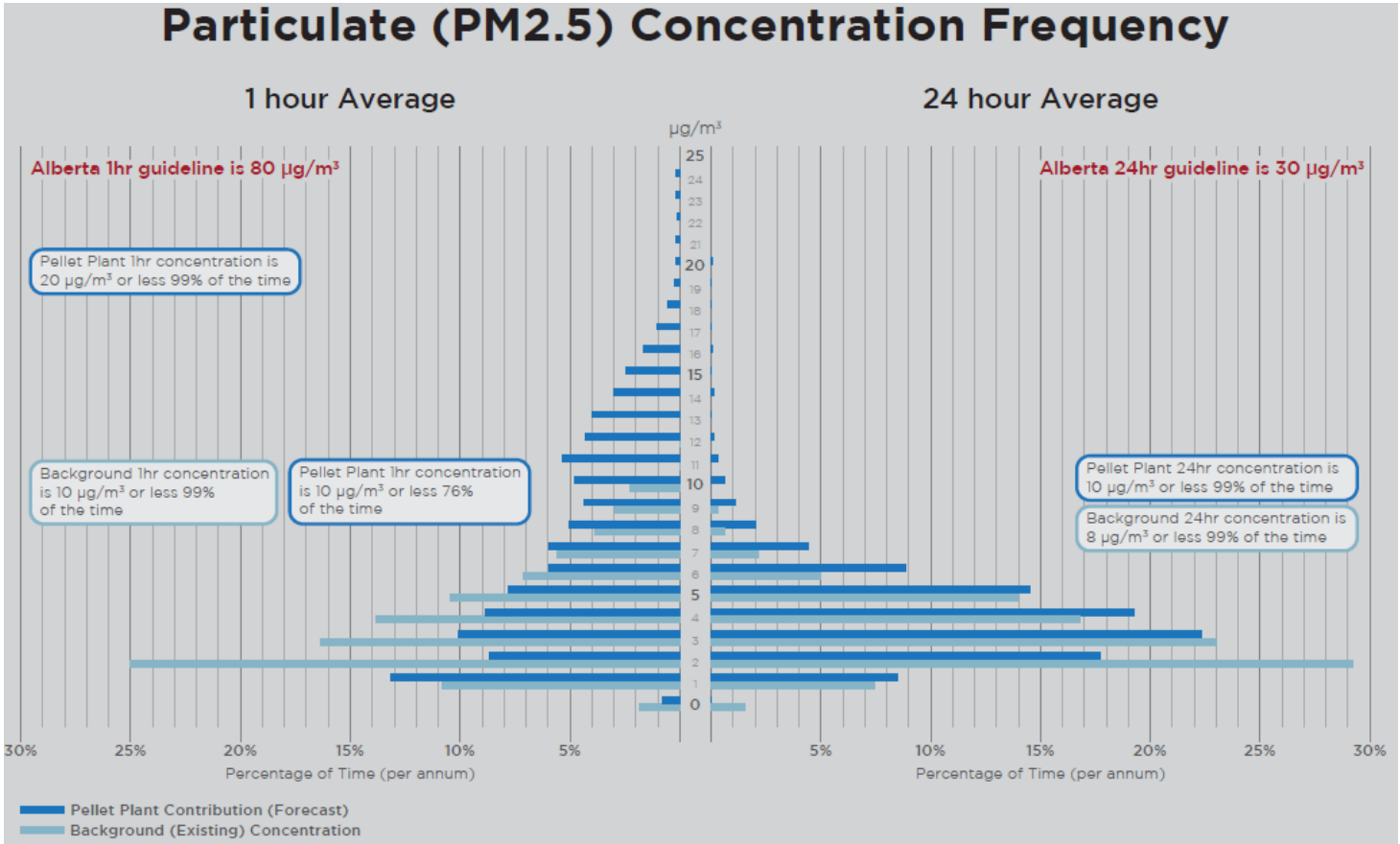
Mitigation Measures – Air Emissions cont'd

Air Model Results

- All air emissions will meet Alberta Environment & Parks guidelines for Particulate Matter <2.5 microns (PM2.5)
- Wood based PM 2.5 is the only critical emission factor from the pellet plant
- Under the worst case operating conditions which have a **significant safety factor**, Alberta air quality objectives in the region are maintained
  - All air modelling was done on a **worst possible case** basis and does not reflect average plant operations
- Alberta AQO Objectives:
  - 1 hour average PM 2.5 concentration below 30 mg/m^3 AQO
  - 24 hour average PM 2.5 concentration below 80 mg/m^3 AQO



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Mitigation Measures – Fugitive Dust

Road Dust

- All roads into and out of the plant will be paved with asphalt as well as the entire working footprint of the plant
- Speed restrictions will be placed on trucks to ensure dust is minimized

Wood Dust

- Outdoor storage yard will be paved to prevent dispersion of dust from loader & truck travel
- Dry shavings will be kept in storage tent and wet/bark sawdust will be stored outside in piles as they are not prone to dispersion
- All conveyors, dryers and pelleters are enclosed

Fugitive Dust

- Entire production process and conveyance system is enclosed
- All Pinnacle sites follow a rigorous fugitive/combustible dust plan to minimize dust dispersion and agglomeration
  - Identifies areas of plant that generate fugitive dust and categorizes each area by level of risk
  - Daily dust audits and action plans to address non-compliance

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Mitigation Measures – Noise

Noise Containment

- Pellet presses and hammermills are located in enclosed areas
- ID fans will have dedicated insulated enclosures
- Noise from mobile equipment is mitigated by the use of blue light and quacker technology along with operation inside of a tent structure
  - No backup beepers will be allowed on mobile equipment or on delivery trucks
- Property is large enough to create a buffer zone and as much vegetation and trees will be retained as possible to provide a buffer
- All roads are paved as to minimize truck traffic noise
- All stacks will be equipped with silencers (mufflers) as to minimize noise levels to 80 dB or less at 1 meter above the stack.
- CN railcar switches anticipated to occur twice per week

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Mitigation Measures – Light, Odor & Water

Light

- High efficiency LED lighting will be employed throughout the facility
- Lighting will be directional and will illuminate plant working areas as to ensure minimal light pollution for surrounding area

Odour

- Product is made from 100% wood with no need for binders or glues
- If any odour is generated by the drying and/or pelletizing processes it is best described as the smell of wood

Process Water

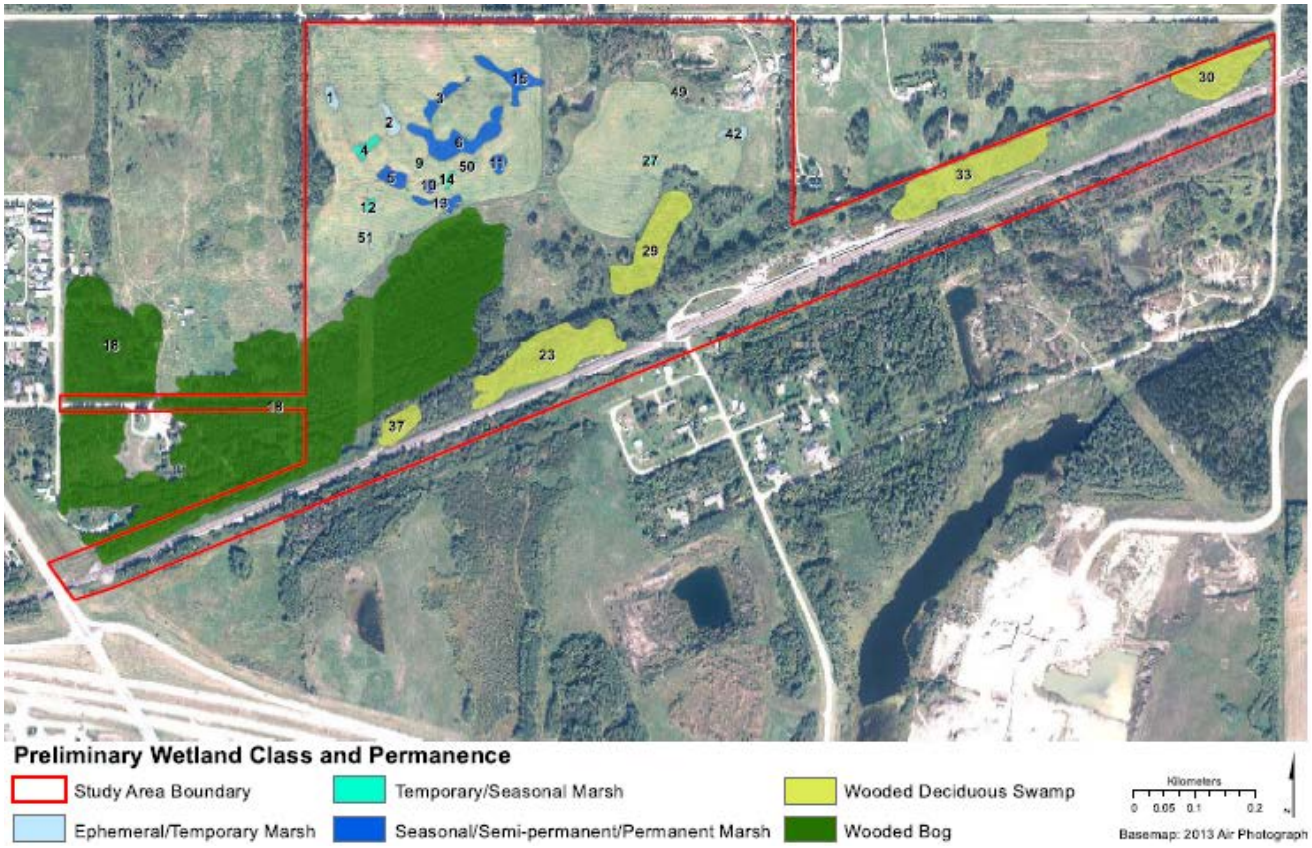
- Water consumption of ~13 gallons per minute is required to support the operation of the Wet Electro Static Precipitator
- Water is subsequently evaporated in the drying process

Drainage

- A ditch system is being strategically located on site as to contain any rain water not absorbed by the sawdust piles
- Flow will be directed to drain into the field to the north of the property
- No hazardous chemicals or substances will be running off site as we do not use chemicals at the plant

Mitigation Measures – Wetlands

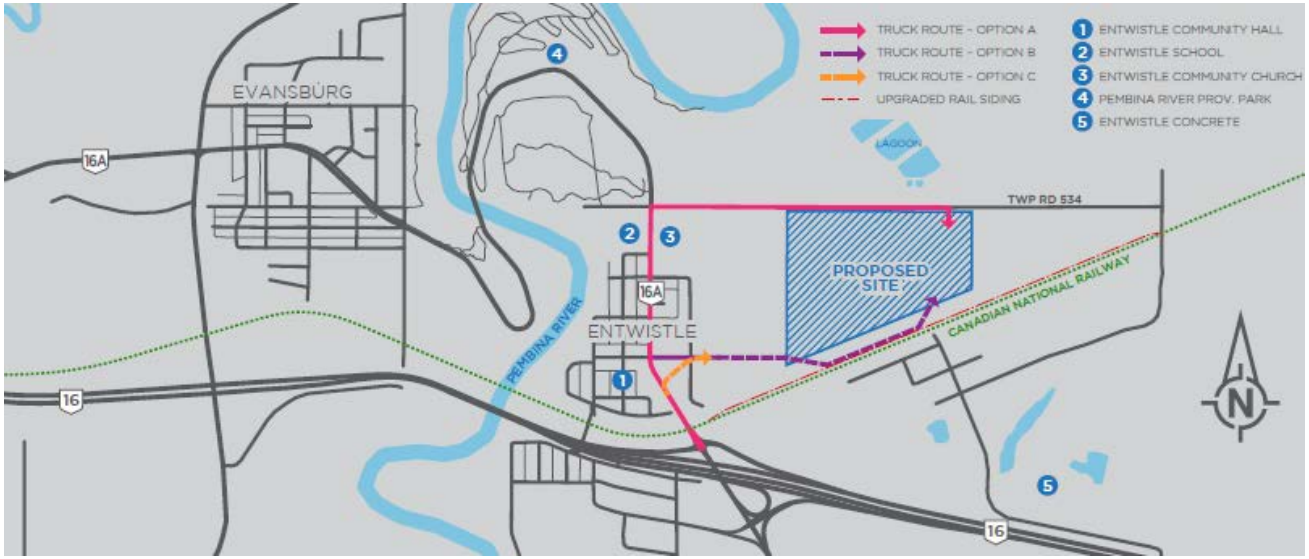
- Development site includes a number of wetlands that under provincial legislation must be avoided or where avoidance is not possible they must be compensated for
- Pinnacle has demonstrated extensive efforts to avoid wetlands as part of the planning and design of the project
  - Early concepts for the siting of the plant would have resulted in extensive impacts to identified wetlands
  - The location of the plant was revised, and the plant and all supporting infrastructure was placed in locations where the smallest number of wetlands would be impacted
- For wetlands that cannot be avoided, Alberta Environment & Parks has tentatively approved Pinnacle's compensation plan, subject to receiving an agreement from Ducks Unlimited who is a recognized wetland restoration agent in the province



Mitigation Measures – Traffic

Traffic Study

- Pinnacle has commissioned Bunt & Associates to conduct a traffic impact analysis in the area
- Three options for truck routing to the site are currently being evaluated by the Ministry of Transportation and Parkland County



Plant Construction Traffic (April 2017 – Nov 2017)

- ~ 5 daily truck deliveries 7 days per week between 7 am to 5:30 pm
- 75 – 100 employees onsite during peak times -> Carpooling is encouraged to minimize traffic

Plant Operations Traffic

Employees

- Two 12 hour shifts running 7 am – 7pm / 7 pm – 7 am
- 11 employees onsite during peak shifts (Mon – Fri)
- 7 employees onsite during off-peak shifts (weekends and holidays)

Deliveries

- 16 hours per day Monday through Friday with daily average of ~4 deliveries per hour

Mitigation Measures – Fire Prevention

National Fire Protection Association (NFPA) Compliance

- All industrial processes have inherent risks associated with them – engineering safe guards into the process is a central element of Pinnacle's safety and fire prevention plan

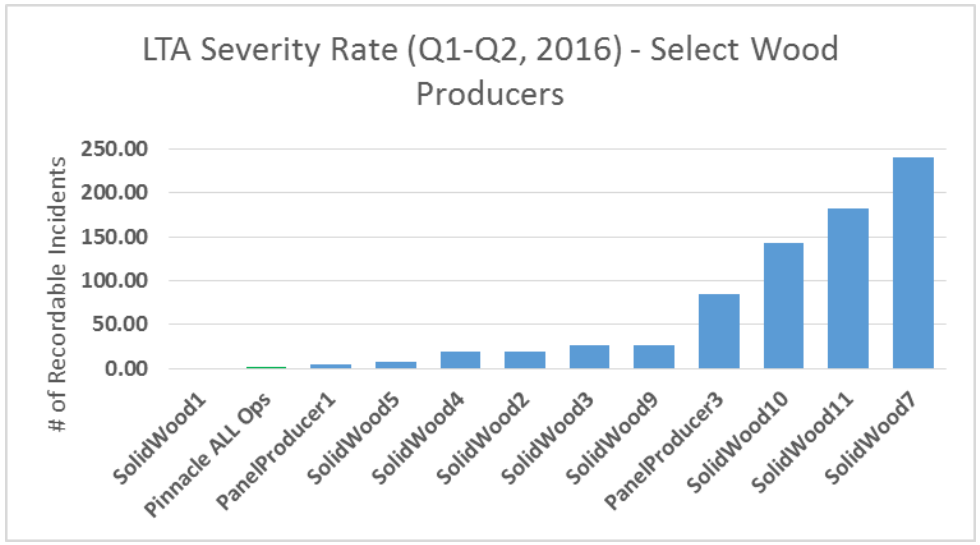
Goal is to manage and minimize risk

- Pinnacle designs and builds plants that adhere and go beyond NFPA guidelines and regulations
- Pellet plants manufacture fuel – we respect the fuel nature of the product and process
- Fire and explosion risk will be managed through:
  - Strategically located sensors and process equipment to prevent propagation of fire event (spark detection, abort gates, deluge, both water and chemical suppression)
  - Pressure rating of containment areas and appropriately engineered suppression and strategic pressure relief is critical to the design
  - Combustible dust management plans are developed for each plant that identify and proactively manage these risks

Mitigation Measures – Safety

Safety

- Safety is at the core of our culture and operations
- Mission is to achieve 0 fires, 0 incidents, and complete employee buy in
- Digital Action Tracking System (DATS) to ensure ongoing training and refreshers
- All employees have demonstrated competency for the tasks they are asked to perform
- Won BC Safety Council award for top safety performer in BC in 2016



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Regulatory Approvals

EPEA (Environmental Protection & Enhancement Act) Application

- Related to environmental discharge approval
- Air shed modelling has demonstrated that the pellet plant will have negligible impact on air quality in Entwistle, and both the Canadian and Alberta Air Quality Objectives will easily be maintained
- AEP (Alberta Environment & Parks) has determined that an Environmental Permit will not be required due to the low environmental risk and low associated environmental footprint of the pellet plant

Water Act – WAIR (Wetland Assessment Impact Report)

- Report and application submitted on January 10th 2017 to AEP
- Currently awaiting agreement from Wetland Restoration agent (expected before end of March 2017)

Water Act – Groundwater Diversion

- Nominal amounts of well water will be required for plant processes (13 gpm)
- No waste water - all water used in the process is evaporated in the drying system
- Currently completing groundwater diversion studies and associated applications
- Plan has been completed and is being registered with Alberta Environment & Parks in accordance with regulations

Parkland County

- Municipal Development Plan, Area Structure Plan and Land Use By-Laws
  - Exiting plan supports agricultural and appropriate non-agricultural land uses
  - Restricted designation will be removed and new policies surrounding Agricultural Industry Developments will be added
  - A new land use district “Agricultural Industry Development” (AGI) will accommodate new agricultural based and alternative energy based development
- Public consultations have been completed

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Project Timelines

- **December 1, 2016** — 1st Public Open House (Introduce Pinnacle and the project; obtain community input)
- **December 15, 2016** — 2nd Public Open House (Provide site plan/ obtain community input)
- **January 12, 2017** — 3rd Public Open House (Provide final site plan/obtain community input)
- **January 16, 2017** — Submit Formal Application to Parkland County for Circulation (30 days)
- **March 2017** — Public Hearing (another opportunity for community input)
- **April 2017** — Construction Start

December 1 – 15 — Conduct preliminary work with Parkland County on site plan and planning requirements.

December 15 – January 12 — Finalize site plan and prepare final documents for Parkland County Review.

January 16 – February 16 — Parkland County Stakeholder Circulation

February 16 – March 1 — Address Comments

March – April — Finalize documentation and approvals

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Summary

- Represents significant investment by Pinnacle of $85 million that will create jobs and a tax base in a region that will be negatively affected by the coal phase-out
- Improves the competitive playing field for the Alberta forest industry
  - Important when considering the pending Softwood Lumber tariffs
  - Consumes more of the local harvest residuals / bush residuals and puts waste materials to good use to generate renewable energy
- Aligns with Alberta's climate action plan:
  - Captures GHGs in a renewable energy product
  - Energy product is utilized to displace coal consumption
  - At peak capacity, Entwistle will create a net reduction of 800,000 Tonnes of CO_2 per year
- Provides 70 new direct full time jobs:
  - 70 new full time direct jobs at the plant and in fibre delivery
  - Jobs will require similar skillset to those in coal extraction and preparation
  - Spin off jobs and revenue for local businesses
- Immediately creates 150,000 hours of labour to complete the construction
- Creates a solid economic driver for the community of Entwistle
- Construction commencing in April 2017 with commissioning in the fourth quarter of 2017 is critical to the project's success and market timing

Pinnacle will partner with the local community to make Entwistle an attractive place to call home

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Questions, Comments & Feedback

Pinnacle is looking to maximize value for all stakeholders and your questions, comments & feedback is important to us

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APPENDIX I: PELLET PROCESS

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Pellet Manufacturing

Product is 100% natural

- Renewable fuel
- Carbon neutral
- Made from compressed wood fibre
- Natural lignin binds the fibre -> **No additives used**

Railcar

Bagged Product

Bulk Product

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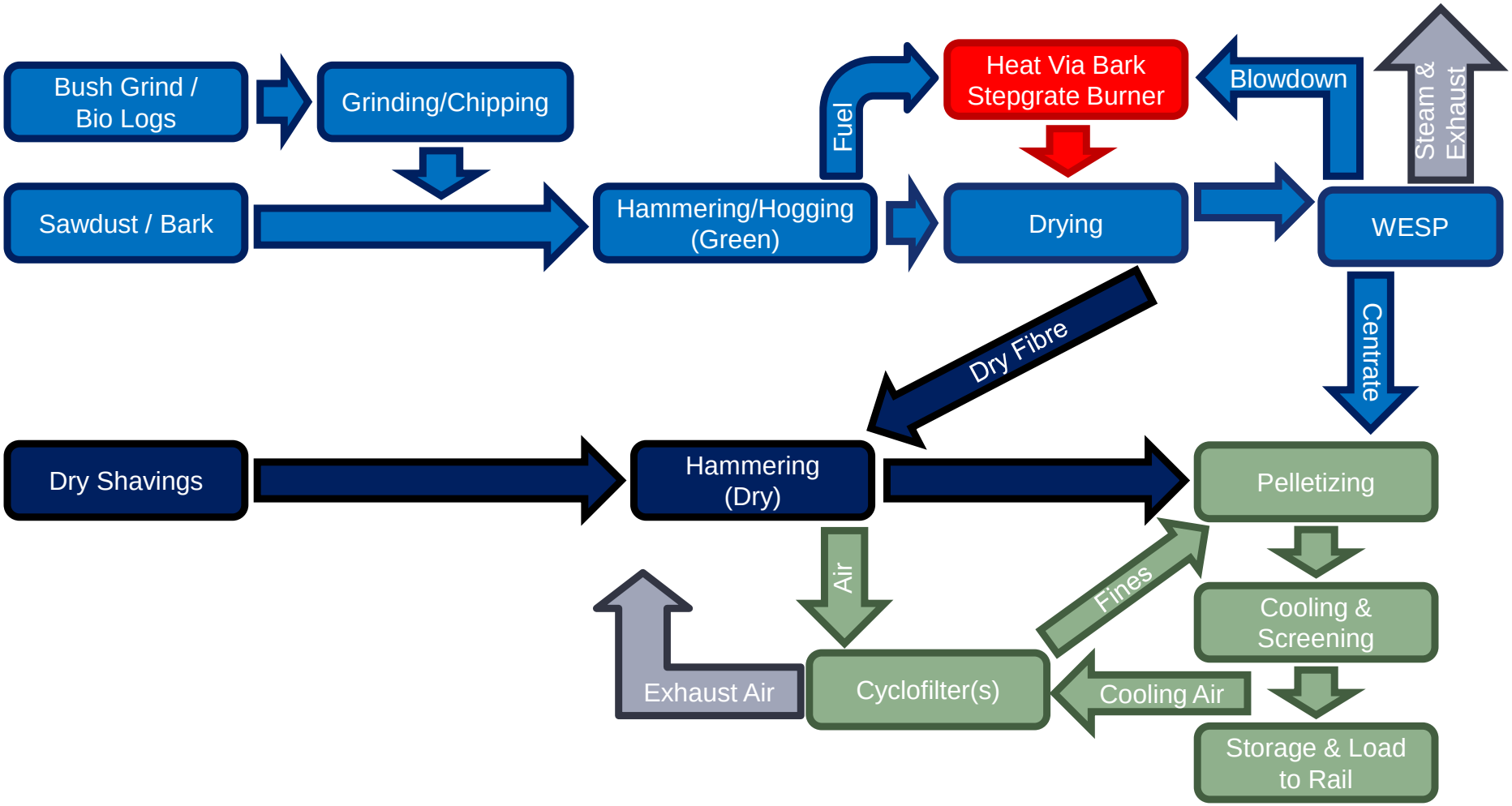
Pellet Manufacturing – Flow Chart



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Pellet Manufacturing – Residual Storage

Raw Material Storage

- Wet material will be stored outside in stockpiles (sawdust, bark, logs)
- Entire fibre storage area is paved to prevent dust dispersion and contamination
- Dry fibre is stored in enclosures to prevent fugitive dust and maintain moisture content

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Pellet Manufacturing – Particle Size Reduction

Grinding and Hammering

- Particles are reduced through a series of steps to less than 2 mm in size
- As such, it is necessary to chip, pulverize and hammer the residuals at various stages of the processing using equipment such as chippers, hammermills, and hogs (biosizers)
- Stones and/or metal is removed during the production process

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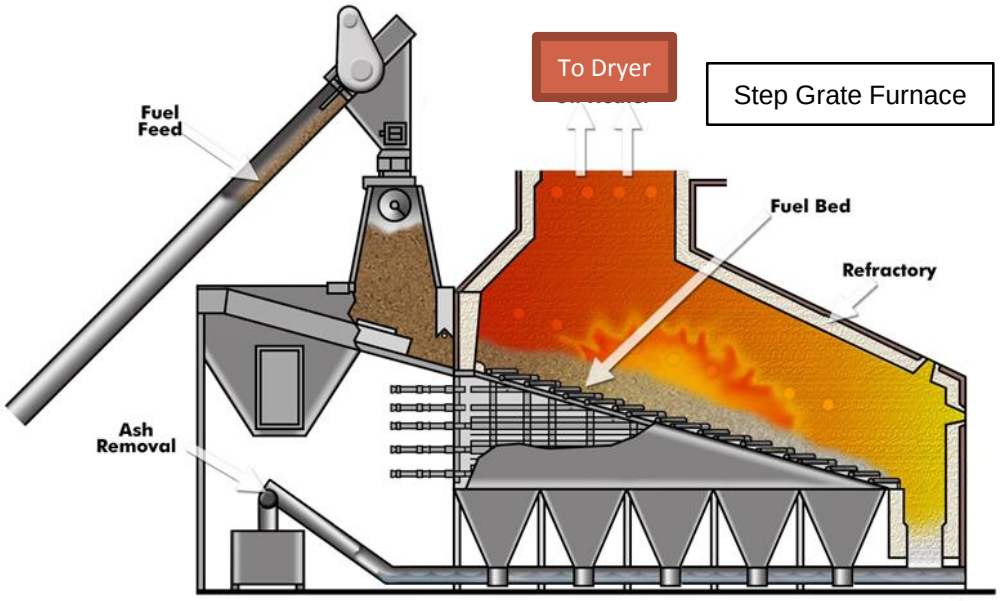
Pellet Manufacturing – Moisture Removal

Drying

- To reduce the shipping weight and to increase the heating value of the product, drying the residuals to a low moisture content is a critical step in the production process
- Pellets commonly have less than 5% moisture content which optimizes customer value
  - Most residuals contain in excess of 45% moisture content by weight at the point of input to the production process
- Most of Pinnacle's plants utilize drum dryers which are the most common type of drying equipment used in North America
- Entwistle's heat source for drying process will be a bark fueled burner in a step grate furnace configuration (direct fired into drum)



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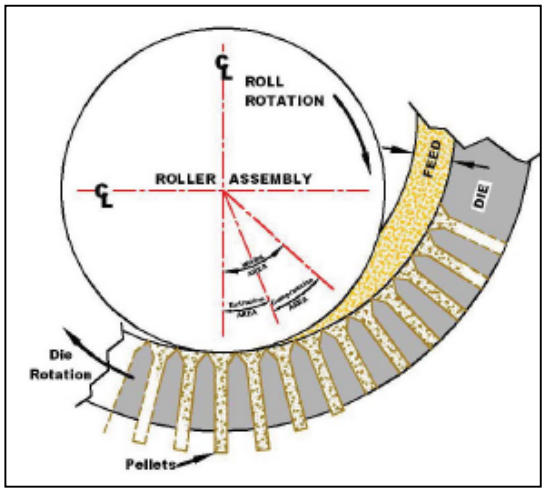
Pellet Manufacturing – Pelletization

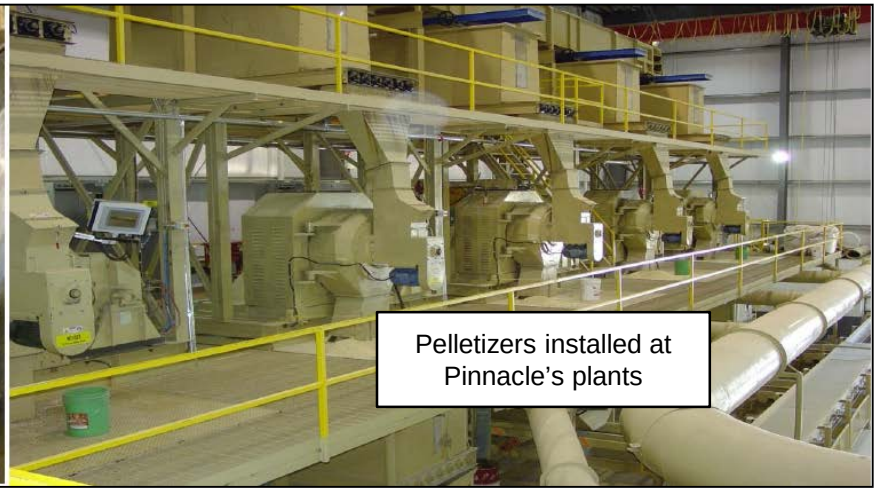
Pelletizing

- Compression into pellets increases both the bulk density and the handle-ability of the product
- Pelletizing machines create a pellet by pinching the dried and milled raw material through tapered hole in a circular metal die.
- The friction created by this extrusion process increases the temperature of the wood fibre to ~ 120 degrees Celsius which causes the natural glue (lignin) in the wood to liquefy and bind the particles together into a cylinder

Roll & Die Schematic



Actual view of Pellets being manufactured



Pelletizers installed at Pinnacle's plants

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Pellet Manufacturing – Cooling and Screening

Cooling and Screening

- The cooling process resets the natural wood glue (lignin) and adds to the pellets strength and durability
- As pellets leave the extruder they are hot (120C) and soft
- The coolers gradually air-cool the pellets, setting thee lignin and creating pellet durability
- Once pellets have cooled, they are passed over a vibrating screen to remove any fine material which is then reworked through the pelleting process

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Pellet Manufacturing – Storage, Loading and Shipment

Storage and Load to Rail

- Silos equipped with temperature controls and aeration are used to store the pellets prior to shipment.
- Wood pellets do not degrade over time, as long as they are stored in dry conditions
- The railcar loading system (shown in picture) consists of two small silos that measure the weight of the pellets during the loading process to ensure optimal railcar utilization
- Gentle pellet loading, storage and transport systems are used to maintain product durability

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Pellet Manufacturing – Vessel Loading

Shipping

- Pinnacle owns and operates the Westview port in Prince Rupert which was commissioned in November 2013
- Storage capacity of 60,000 MT and scalable to 90,000 MT
- Terminal is able to load (dust free) 2,000 metric tonnes per hour
- First dedicated wood pellet terminal in the world capable of handling Panamax vessels. Panamax vessels can transport in excess of 60 of pellets (600 railcars)
- Ocean freight efficiency to Europe is created through the use of seeking an Atlantic Ocean backhaul after delivery of dry bulk ca from either South America or the US Gulf
- Asia is a growing market in which Pinnacle has a freight advanta to other wood pellet producing regions (US South East)

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APPENDIX II: MARKET FACTS

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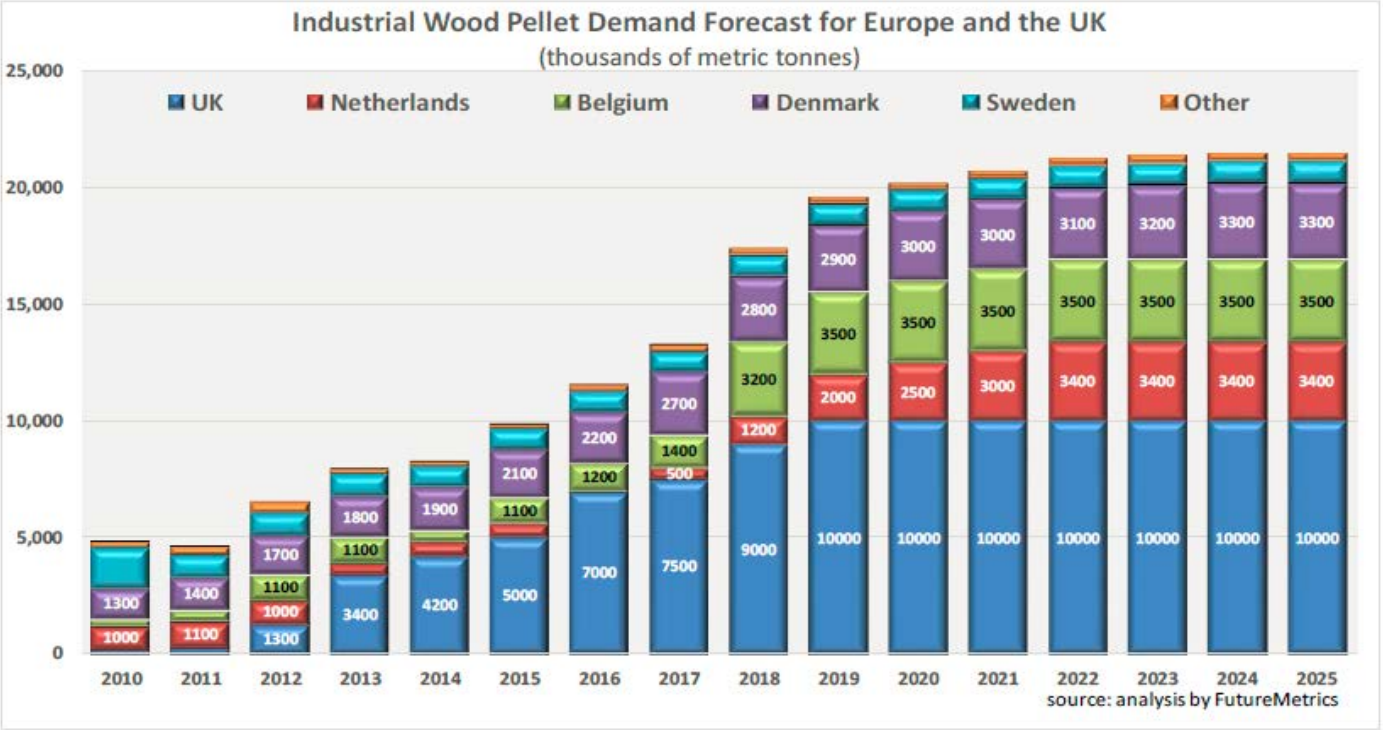
Wood Pellet Market Introduction

- Primary customers are large secure utilities in both Asia and Europe that have converted power stations either partially or fully from coal to wood pellets
- Very stable and growing market with contract pricing and volumes fixed for up to ten years
  - Pinnacle's current market portfolio has an average remaining contract term of nine years
- International markets are underpinned by long-term carbon mitigation commitments
- The use of Pinnacle Renewable Energy Inc. pellets has reduced global carbon emissions by 2.5 million metric tonnes per year (roughly equal to 1 million motor vehicles)
- One of Pinnacle's markets is the United Kingdom where today 1% of all the electricity generated is produced using wood pellets from Pinnacle
- Pinnacle's reputation as a reliable, high quality renewable energy supplier provides fuel risk coverage for new conversion projects seeking project financing



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APPENDIX III: DIESEL PM

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Mitigation Measures – Emission Characteristics / Diesel PM

Air Emission Characteristics

- Wood based PM 2.5 is the only critical emission factor from the pellet plant
- Due to the fact that wood contains negligible amounts of Sulphur and Nitrogen, neither NOx nor SOx are pollutants of concern

Diesel Truck Emissions

- Onsite truck traffic will be a small fraction (approximately ~1%) of the overall point source emissions from the plant which modelling shows does not cause exceedences
- Multitude of species that contribute to particulate matter in diesel exhaust
  - Nitrate, Sulfate, Elemental Carbon / Soot, Organic Carbon and Others
- Some stakeholders were concerned that the organic carbon and others include carcinogenic species
- It is important to note that the particulate matter objectives in Alberta were developed from health studies for PM in urban areas that would derive from a number of sources including vehicle traffic
  - Wood based particulate matter at a given concentration is less toxic than an equivalent concentration of an average urban environment
  - At Entwistle, diesel particulate matter would be a small fraction of the overall emissions (which are not causing exceedances)
  - Any carcinogenic species would be a small fraction of the diesel PM which is a small fraction of overall emissions