Proposed Direct Transfer Coal Facility

Presentation to: The Corporation of Delta

February 18th, 2013
www.fsd.bc.ca
Agenda

1. Introduction
2. FSD Background
3. DTB Coal Project
4. Questions
5. Appendix
About Fraser Surrey Docks

- Fraser Surrey Docks is the largest multi-purpose terminal on North America’s West Coast.

- Fraser Surrey Docks celebrated its 50th Anniversary in 2012.

- Each year, Fraser Surrey Docks handles 400 deep-sea vessels that bring millions of tonnes of cargo through the terminal.

- Fraser Surrey Docks employs 280 full-time employees and contributes to the 4,000 jobs at Port Metro Vancouver in the City of Surrey.
Location of Fraser Surrey Docks

On the Fraser River two hours sailing from the Gulf of Georgia linking to the Pacific Ocean...
The Fraser River

- At 1,400 km long, the Fraser is the longest river in British Columbia.

- The Fraser River contributes $4.1 billion in economic output and supports 18,000 jobs.

- The Fraser River is as economically significant to the Canadian economy as the St. Lawrence Seaway.
Growth in Business

- We have been in business and an integral part of the Surrey community for 50 years.
- Safe and efficient operations continue to be our number one focus and our track record speaks for itself.
- Fraser Surrey Docks is currently operating below its capacity and needs to expand.
- Fraser Surrey Docks is a vital deep sea port with Port Metro Vancouver, and it is important to facilitate safe, efficient and environmentally conscious ways to expand.
- Our goal is to grow and expand the terminal, regardless of commodity, with the least possible adverse impact on our community and stakeholders.
- Vessel, truck and rail traffic significantly decreased in 2009/2010 and has not returned to historical volumes.
- Recent business volumes have increased slightly, but this project would only result in half the number of train movements we had prior to 2009.
Overview of DTB Coal Facility Project

• Our goal is to create a minimal-emission free facility and our focus remains on dust suppression and spill prevention and response

• FSD is permitted to handle coal under its existing lease

• FSD has applied for a permit to build a new coal handling facility on site

• New handling facility will (i) receive full unit trains of coal, (ii) unload coal from bottom dump rail cars into fully enclosed shallow pits and (iii) directly transfer coal from the shallow pits via covered conveyor belts to waiting barges, with no coal storage during normal operations

• The facility has been designed to unload and release a full 135-car unit train in less than eight hours, allowing for the unloading of a unit train onto two 8,000 DWT barges in one regular shift

• Coal will be barged from FSD to Texada Island, where it will be stored and eventually loaded onto deep sea vessels

• Expected annual throughput:
  • 2 million MT in year 1, or 160 expected coal train deliveries
  • 4 million MT in years 2-5, or 320 expected coal train deliveries per year
Project Layout

- Ashross pit area
- Conveyors to barge loader
- Clockwise rail flow
  - 20-24 car segments moved via indexer system & loco
Commitment to Community

Fraser Surrey Docks is working hard to create a facility without any negative impacts to the community. That being said, we understand that the community may have concerns in six main areas:

1. Impact to marine habitat and fishing access
2. Impacts to the flood control containment areas
3. Transportation delays or congestion caused by increased rail movements
4. Dust Control
5. Potential increase in noise and risk of exposure to spill and contamination
6. Emergency response
Proposed Marine Operations
### Ship Movements from July 2010 to June 2011
(by type and route)

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<td>Fishing</td>
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<thead>
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<tr>
<td>FSD 2 million</td>
<td>320</td>
<td>4.3%</td>
</tr>
<tr>
<td>FSD 4 million</td>
<td>640</td>
<td>8.7%</td>
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</table>
Marine Risk Assessment

- Det Norske Veritas (Canada) Limited (DNV) was hired by Fraser Surrey Docks to perform a navigational risk assessment of proposed coal barge operations in the Fraser River to assess possible navigational risks associated with increased coal barge traffic.

- FSD held a stakeholder meeting in August 2012

- FSD presented to the FR Stakeholders and DNV, the proposed movement of coal barges from FSD to Texada Island, BC.

- Stakeholders included the Fraser River Pilots, Council of Marine Carriers, Lafarge, FSD, Transport Canada, BC Chamber of Shipping, Port Metro Vancouver and DNV

- It was concluded that the new barge traffic did not represent any new operational issues or concerns that were not already being conducted or considered
Characteristics of Coal

• Coal is formed naturally from peat (decayed plant material) through the application of heat and pressure over millions of years.

• The pressure squeezes out the water and pushes out methane and other gases making the deposit rich in carbon over time.

• First type of coal to form is lignite, followed by sub-bituminous, bituminous and anthracite.

• The coal FSD will be handling is a cleaner burning sub-bituminous coal, with an average sulfur content of 0.29%.

• The main chemicals of concern in coal are metals, metalloids and polycyclic aromatic hydrocarbons (PAH) which release from coal when it is burned.

• The conditions for release are not present during normal handling rendering coal essentially inert.

• Coal dust is also inert but would be considered an irritant and hypoallergenic no different from any other exposure to dust.
Impacts of a Coal Spill - Marine

- As part of the due diligence process in designing the facility, FSD established an Environmental Management Plan (EMP). Within this document and in working with several different Environmental Consultants (Triton, Levelton) it was determined that the accidental release could be largely addressed through risk prevention measures and would not be expected to have a significant environmental impact.

- The potential chemical effects of coal in water are variable, with some considering unburned coal to be largely inert (Chapman et al. 1996).

- All trace elements for customers’ coal would not exceed BC Working sediment quality guidelines for freshwater or marine (Triton as per data from customer; FSD EMP 2012)

- PAH are expected to remain bound to the coal particles thus limiting their bioavailability (ATSDR, Toxicological Profile, PAH, 1995)
Specifics on Train Movements

FSD is proposing an increase of approximately 10% in overall City of Surrey coal train traffic.

- Planned capacity excluding FSD ≈ 45M mt annually
- FSD proposed capacity ≈ 4M mt annually

Coal trains intending to unload at Fraser Surrey Docks would consist of:

- 125 to 135 unit train car lengths
- 53’ aluminum bottom dump cars
- Four 4,500 hp locomotives; two in the front and two in the rear
- Maximum overall length of 7,555’ or 2,303 m

FSD is proposing to add a single train movement per day to the current total train movements of 46 which is a 2% increase.
This design option allows for 24 loaded cars to be spotted up to the unloading pit, with another 24 (empty) cars being pushed through after the pit in a clockwise direction. This configuration would require six spots of a maximum of 24 cars for a full unit train to be unloaded.
Rail Routes

FSD used to handle 4 trains per day prior to 2009, 4 million MT is only 1 train a day
Air Emissions - Rail

The transportation industry as a whole contributes over 25% of all GHG emissions in Canada and the U.S. However, rail operations only contribute approximately 3% of the emissions from the transportation sector while moving more than half of the surface freight.

Overall rail emissions of GHG per unit of RTM have decreased by 25.6% between 1990 and 2011. Emissions of CACs have declined, largely due to new locomotive designs and fuel conservation initiatives.

Anti-idling technology and policies
FSD will request that all locomotives are equipped with some form of anti-idling device, which under certain operating conditions will shut down the locomotives instead of letting the engines idle.

Rail lubrication
FSD intends to install both gauge-face and top-of-rail lubrication systems in areas with high degrees to reduce the amount of friction at the wheel-rail interface. This will effectively reduce not only noise, but also emissions due to reduced engine torque requirements.

TRANSPORTATION GHG EMISSIONS

- 47% Passenger
- 24% Road freight
- 14.2% Off-road
- 4.4% Aviation
- 3.2% Rail
- 3.1% Marine

Source: Environment Canada
In 2011, BNSF revised coal loading rules, with objective of reducing coal dust losses from cars by at least 85%. Based on years of study, starting in 2005 and including a “super trial” in 2010

Conclusion that the release of coal dust can be significantly reduced by (i) loading cars with a modified load chute that produces a rounded contour and (ii) using the topper agent to place a crust over the loaded coal

Shippers are deemed to be in compliance with BNSF’s loading requirements coal cars are loaded using BNSF’s Load Profile Template (15 to 30% reduction) and approved topping agents (minimum 85% reduction)

All shippers must comply with BNSF’s standards, demonstrating that dust will be reduced by 85%. This loading rule came into effect on October 1st, 2011 and was incorporated into the BNSF Tariff in 2012

Our customers have confirmed in writing that they will comply with the profiling and use of a topping agent that demonstrated a 92% reduction

In addition to both those measure our customers will also apply a body treatment to assist in dust mitigation and prevent spontaneous combustion
Dust Control at the Terminal

Rail Unloading and Transfer to Barge

- Enclosed reduced drop height shallow bottom dump unloading pits with direct side spray
- Sealed “dustless” transfer points (passive technology) along with wetting agents
- Conveyors installed with covers and spill trays
- Weather conditions and dust levels monitored continuously at the unloading site (i.e. high wind shutdown)
- Barge loader fitted with a height adjustable snorkel to limit the drop height
- Final topography of coal on barge “profiled” to reduce loss due to wind
- Increased sidewalls on barges
- After unloading, empty rail cars will be sprayed inside the unloading shed in order to rinse off dust prior to the return journey
Results from the Air Dispersion Model for Particulate Matters (PM$_{2.5}$) – Dust

- All levels are expected to be less than BC’s Ambient Air Quality Objective for PM$_{2.5}$ of 25 µg/m$^3$.
- FSD is in the process of applying for Metro Vancouver Air Emissions Permit.
Noise Mitigation

- FSD in conjunction with BNSF, AECOM and Triton Environmental have developed a Noise Mitigation Plan for the construction and operational phase.

- All rail movement and shunting within the Port Authority Rail Yard and Terminal Rail yard is restricted to < 3 mph

- With the closure of Elevator Road by SFPR, whistle annunciation on the BNSF Main will be eliminated

- With the relocation of rail onto Elevator Road and the shifting of Bekaert’s road access, a crossing is eliminated, reducing whistle annunciation to Robson Road only

- Shunting of a reduced string of 24 cars will create less noise than shunting of a full unit train
Incident Prevention

FSD’s goal is to create and incident and injury free facility.

As part of our planning for this project, all potential impacts and corresponding measures were identified to ensure safe environments. These design objectives have been integrated into the GC Design Build Contract and will be managed through several channels:

- **CWA Engineering** – acting as the owner’s representative to the Design Build Contract

- **Triton Environmental** – acting as the owner’s representative during construction and the Design Build Contract

- **CFT Engineering Inc. Fire and Safety code consultants** – acting on behalf of FSD
Emergency Response Plan

Safety is the number one priority at FSD and we have a proven track record in safety.

There are stringent operating procedures that are required for safe and effective terminal operations:

- Complete Operational Risk Assessment with union representatives and employees, which become incorporated into the terminal’s SOP and SWP
- Comprehensive Spill Response Plan (in conjunction with PMV)
- Comprehensive Emergency Response Plan (in conjunction with CoS FD, rail and marine operators)
Emergency Response Plan

• FSD engaged several third party consultants to minimize the risk of fire
• Fire plans will be reviewed by both Surrey and Delta Fire Chiefs/Departments
• On site orientation will be provided to both Surrey and Delta Fire Departments

• **RKMS Group** - Experienced in fire and safety management plans, created a Fire Safety Plan for the construction and operation of the facility

• **CFT Engineering Inc.** - Fire Protection Engineering and code consultant will ensure the design of the facility and fire suppression systems are in line with the BC and National Fire codes
Thank you

Questions & Discussion
APPENDIX

1. Volume Details
2. Regulatory Review Details
3. Barging and Marine Risk Assessment Details
4. Flood Control and Containment Details
5. Train Movement Details
6. Incident Mitigation Details
# Schedule of Volumes 2005 - 2012

**FRASER SURREY DOCKS**  
Volumes by Commodity

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
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<td>LUMBER (MFBM)</td>
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**Notes:**
- TEUs: Twenty-Ton Equivalent Units
- MT: Metric Tons
- MFBM: Mafi Foot Board Measurement
- MSCRIB: Metric Short Cubic Feet

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**FRASER SURREY DOCKS**
## Vessels by Commodity 2005 - 2012

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FRASER SURREY DOCKS
Vessels by Commodity
Project Commercial Structure

Production
- Coal produced at US mines
  - Produce coal and prepare for shipment on BNSF railcars

Transportation to Storage Facility
- BNSF rail
  - Rail transport of coal from US mines to FSD terminal. Upgrade to rail switch at FSD required.
- FSD terminal
  - Transload of coal from BNSF railcars to FSD Partner-operated barges. Slight upgrade to FSD facilities required.
- Barges
  - Shipment of coal via barge from FSD terminal to FSD Partner-owned facility at Texada Island, BC

Storage pre International Shipment
- Storage facility
  - Storage of coal at FSD Partner location at Texada Island, BC

International Shipment to End Customer
- Ship loader
  - Load coal onto bulk shipping vessel at Texada Island, using FSD Partner-owned shiploader
- Bulk shipping vessel
  - Transport coal from Texada island to end customer
- End coal customer
  - Receive coal from bulk shipping vessel
Project Timeline

- **January 2012:**
  Initiated discussions with BNSF & Lafarge

- **February 2012:**
  Met with potential coal customers
  Validated project

- **March/April 2012:**
  Negotiated MOU with Lafarge
  Engaged discussions with internal stakeholders

- **May/June 2012:**
  Prepared permit applications per PMV and external stakeholders; submitted official application to PMV on June 13th, 2012
  Submitted project plan to PMV
  Prepared models, conduct analysis and detailed project information

- **August 2012:**
  Concluded Transshipment Agreement
  Conducted marine risk assessment, transport study, consultations and other required permitting processes

- **September to January 2013:**
  Conclude on construction budget
  Conclude on permit requirements
  Initiate external consultation with City of Surrey and First Nations

- **February 2013:**
  Receipt of PMV project and building permits (Target March 1st)

- **March 2013:**
  Construction starts
  Finalize customer contracts

- **August 1st, 2013:**
  Commence operations
FSD has retained the services of external consultants to assist with the design and required regulatory review components for this project.

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<th>Review Element</th>
<th>External Consultant</th>
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<td>Design and Engineering</td>
<td>CWA Engineers, AECOM</td>
<td>Review for proper design and that best industry practice is being followed</td>
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<tr>
<td>Transportation</td>
<td>AECOM</td>
<td>Review of proposed rail operations at FSD site and impact of coal trains on Surrey rail and road network</td>
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<tr>
<td>Marine operations</td>
<td>DNV</td>
<td>Review of potential marine risks at FSD and on Fraser River and associated mitigation measures</td>
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<td>Environment</td>
<td>Triton Environment, Levelton &amp; RKMS</td>
<td>Review of potential environmental impacts, including air emissions, noise, fire safety, local soil and habitat, marine habitat, and others. Review of FSD Environmental Management Plan. Advice to develop policies, procedures and mitigation strategies.</td>
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<td>Stakeholder Engagement /</td>
<td>National Public Relations</td>
<td>Review and assistance in stakeholder and community engagement, including the City of Surrey, other municipalities, local residents and business owners</td>
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<td>Communications</td>
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<td>Real Estate</td>
<td>Underhill</td>
<td>Review of application lease and zoning provisions to ensure compliance</td>
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<tr>
<td>Fire Code Compliances</td>
<td>CFT Engineering Inc., RKMS</td>
<td>Review of detailed project design and engineering in the capacity of fire and safety compliance, training, procedures and policies</td>
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</table>
Barging - Tandem Towing

- Tandem towing will typically only happen on the open ocean in good weather
- Beyond Sandheads is a clear and safe area free of river traffic to pair up barges

- Two barges meet and shorten lines (each with a tug in control)

A) Barge 1 remains still while barge 2 is positioned to be linked up. B) Then the tug ties line up between both barges to secure for towing

- Once barge 1 & 2 are “tandem” then tug 2 is free to leave

- Reverse will happen at Beale Cove (tug will be working/waiting at Beale cove to assist with breaking of the set)
The objectives of the study were to:
1. To assess marine navigation risks of barging coal in the Fraser River, from kilometer marker -1.0 mouth of the river to FSD at kilometer marker +34.0
2. To identify specific risk mitigation processes that could be implemented to reduce or eliminate the risk

The stated scope of work included:
1. Determine Navigational Impacts of increased barge traffic in the River
2. Conduct a risk review and mitigation analysis, including meeting with key stakeholders
3. Conduct risk analysis related to the proposed coal barge movements on the Fraser River and cover marine environmental, occupational health and safety and public safety risks
4. Document the risk review, including the outcome of the stakeholder meetings, and provide a summary of the impact and risk mitigation processes that would be implemented
Marine Risk Assessment Findings

- The frequency assessment, consequence assessment and risk analysis, were performed using a computer based modelling system.
- This was used to simulate various proposed coal barge and assess the seven potential risks that were identified.
- It was concluded that the proposed coal barge operations do not present any new operations or issues of concern that are not already being conducted or considered in the river.
- FSD and Lafarge have developed new barging standard operating procedures to control and mitigate against all risks that were identified in the study.
- In addition, all tugs and barges will be inspected on regular intervals to ensure they meet the required Transport Canada regulations and be equipped with fire suppression.
- Tugs will be selected in accordance with current weather conditions and load characteristics to ensure proper match.
- Barges hull will be compartmentalized so that if one compartment is punctured the damage can be maintained and barge remains afloat with no chance of spillage.
- Barge operations will not be conducted in high wind conditions, or foggy conditions.
- Lafarge, the marine operator, is highly experienced with river conditions and navigation and have been operating barges in the river for over 20 years.
Flood Control and Containment

- FSD has a well established “Emergency Response Planning for Fraser River Flood Scenario” ERP that operates in conjunction with the CoS.

- Surrey is protected from high water on the Fraser River by a network of Dykes built alongside the banks of the river. These Dykes were built 18” higher than the freeboard from the 1948 river levels. 1948 was the last year in which there was major flooding along the Fraser River in the lower mainland.

- The terminal at Fraser Surrey Docks was built after 1948 and was constructed with the majority of the property being at or above the level of the Surrey Dyke network.

- **The 3.8m marks the 200 year flood level.** Approximately 30% of the terminal surface area lies below **the 3.6m mark, the 200 year flood level.** A very small portion along Elevator Road lies below **the 3.2m mark of the 150 year flood level.**
Elevation – Robson and Elevator Road

Typical elevation of $> +3.8m$ or 200 year flood, will be maintained for all new construction.
Unloading Process at the Terminal

1. A 125 car unit train with four road engines would arrive loaded the BNSF’s main. Time of arrival is between 0000 and 0600.

2. During the arrival process, it is expected that the Elevator Road BNSF road crossing may be closed to a maximum length of ten minutes.

3. Once unloading of all six 24 car spots is completed, the train is again assembled in the Port Authority Rail Yard (PARY) into two strings.

4. BNSF will reassemble their outbound empty train together, doubling it out and placing their road power on each end.

5. During the departure process, it is expected that the Elevator Road BNSF road crossing may be closed to a maximum length of ten minutes. Estimated time of departure is between 1600 and 2200.

*Note: It is expected that once Elevator Road is closed to general public in September 2015 due to the SFPR, the total impact to vehicle traffic the area will be eliminated.*
Dust Control – BNSF’s Loading Rule

Rail at Origin
- Final topography of coal into coal cars must be “profiled” to reduce loss due to wind and vibration
- Once the properly loading of coal into rail cars is complete, coal mines must spray the coal profile with a further suppressant compound

Rail on Route
- The suppressant applied at the time of loading is expected to be effective through the entire transit to FSD. The coal will also have “settled” between leaving the mine and arrival in BC
Incident Prevention

FSD’s goal is to create and incident and injury free facility. FSD has a proven track record of safety and quality handling.

- **COR Compliance** – a very detailed annual safety audit of the Company’s safety policies, SWP, standards and practices by a third party
- **Training, training and training**
- **Employee experience** – labor employed to operate the facility will be the same experienced workforce employed at WST
- **Joint Member Site Safety Committee** – consists of management and the three different unions on the terminal
- **Community involvement** – FSD has a very good relationship with the CoS Fire Department and Emergency Response. The Fire Chief inspects the terminal on an annual basis. High angle rescue and other activities and frequently practiced at FSD by CoS Emergency Response Teams
Project Due Diligence – Design, Construction and Operation

1. Overall Project Impact Mitigation Plan
   - Surface Water Quality and Sediment Control Plan
   - Environmental Monitoring Plan
   - Hazardous Materials Management and Spill Response Plan
   - Soil Management Plan
   - Air Quality Management Plan
   - Noise Management Plan
   - Pile Driving Plan
   - Dust monitoring

2. Standard Operating Procedures
   - Weather and Dust Monitoring Plan
   - Dust Management Plan
   - Runoff Management Plan
   - Emergency Response Plan
   - Lighting Plans
   - Noise Management Plan
   - Stakeholder Response Plan
   - Fire and Safety Plan