

August 27, 2013

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Re: Analysis of Options for Covering Barges

Jim

We remain confident that our proposed facility (the “Project”) can handle coal safely and without significant impact to stakeholders. We are confident that we have carefully considered possible sources of fugitive dust and have come up with mitigation strategies that successfully control areas of exposure. We have employed industry best practice throughout the Project design and the Project’s operational plans.

As we continue to review the Project-related comments and feedback from various stakeholders we recognize that many of them do not share the same level of confidence. Several concerns were raised over the effectiveness of our current mitigation strategy with respect to coal dust emissions from barges. In this regard, we evaluated potential strategies and have now committed to making an improvement that will provide further dust control for the barge movements.

After thorough review of potential alternatives, FSD has decided to apply an environmentally benign “binding agent” and “surfactant“ during the barge loading process, to prevent fugitive dusting during barge transit.

Process

The coal transport industry is currently using this suppressant technology in the marine environment to successfully control fugitive dust. This process is currently in practice on Powder River Basin coal in barge movements in the US gulf.

The coal would be sprayed with two separate products prior to being loaded onto the barge – a surfactant and a binding agent. This system would be plumbed into the conveyor system at FSD, in a manner similar to the water suppression system. The material would be applied to the coal as it passed through the conveyance system at a transfer point close to the surge bin.

In addition to suppressing potential fugitive dust, the agents also aid the flow of coal through the logistics chain. The effectiveness of the two agents is not diminished by the drop height of the barge loader. Once sprayed, the agents remain effective for the entire barge movement and subsequent storage period at Texada Island.

Treating the coal as it passes through the FSD conveyor system, rather than just the surface of the stockpile on the barge, allows for 98-100% of the coal to be coated with the agents. Applying the agents after the coal has been loaded to barge would only allow for a coating of the top layer.

Prior to arrival at FSD, the coal will have been treated on four other occasions, each of which lessens the potential for fugitive dust emissions:

- a) Addition of a primary “body agent” at the mine site that helps binds coal together to lessen potential dust emissions
- b) Addition of a secondary “body agent”, as required to assist in preventing oxidation
- c) Addition of a “topping agent” when the coal is loaded into the railcar at the mine site that acts as a hard cover and sealant, and lessens the potential for coal dust to leave the railcar
- d) Reapplication of a “topping agent” approximately at midpoint of the rail movement from the mine site to FSD to address concerns regarding the potential degradation of the “topping agent” during transit

Products

To further mitigate against dust releases from the coal barges, GE has suggested a solution similar to products being used in the rail supply chain. These products are mixed with the coal at the mine site and are agents used to specifically suppress dust. The types of products currently in use are:

- a) DusTreat DC9144 or DC9148 – are “dust suppressors / anti-oxidants” used to prevent dust through agglomerating the fine particles as a binder and reducing the weathering of coal
- b) DusTreat DC6109 or DC9138E – are “binding agents” specifically formulated to enhance the effectiveness of the dust suppression products

For the purposes of controlling the fugitive dust on barges FSD will be using a combination of DC9144 or DC9148 and DC9138E.

It is therefore accurate to say that the GE agents applied at the mine site have an express level of dust control that is dependent on supply chain conditions. Antioxidant agent properties extend well beyond the supply chain period.

GE has confirmed that the treatment process will reduce dust by approximately 90%. This estimate is based on historical data and observation at other facilities that are using the same dust suppression techniques. As a result we are very confident that the application of this product at the Project site will effectively control dust on the barges en route. Only 2% of the total barge load will be in the sub 100-200 micron sizing. This is the sizing of material prone to become airborne = dust. Furthermore, consideration must also be made that only the surface area of the stockpile on the barge (approximately 1500T) would be exposed during transit.

When you compare the cumulative factor of the applied dust suppressant agents (i.e. $90\%^2$), together with the inherent dust gradation of the product (1-5% dependent on sieve size thresholds) and the exposed surface area of the coal on the barge, the anticipated coal dust residue would be insignificant. It is therefore anticipated that the potential volume of product loss, should any product be lost, is comparative to less than 5% of the Minimum Reportable Levels of Product Loss [for coal] under the Environmental Management Act.

Considering that the amount of time it would take for the coal to be within the PMV's area of interest is only 7 days (1<2 days at the mine, 5 days train transit and 1 day unloading to barge) the effectiveness of the agents extend well beyond the supply chain period.

MSDS sheets are attached.

Existing Usage of GE Dust Suppression Products

GE dust suppression products are currently in use throughout several locations in North America including the Powder River Basin. However, the most significant correlation to our project is in Alabama, where the products are applied at a transfer point just prior to being loaded onto barge. The barges are then transported 600-700 miles to the thermal utility. The barges operate primarily in river conditions and are exposed to wind. The performance has been exceptional and we have been advised they have not experienced any dust issues. In fact they handle a variety of coal types and barge captains prefer to handle the treated PRB coal over all others.

Facility Changes

This additional mitigation measure would require approximately \$200k of permanent equipment at FSD. The application of the product on an ongoing basis would increase operating costs by roughly \$0.22 per tonne. Although this cost has a large impact on the Project, it is still considered commercially and technically viable, unlike several of the other dust mitigation options considered.

As noted above, the agents would be applied in the Project conveyor system as it is currently proposed, requiring no significant design changes. The storage sheds, pump house and piping system connections would be portable and the total space required would be roughly 20 feet by 40 feet which would also accommodate product deliveries.

Other Options Reviewed

Before coming to a decision to apply an environmentally benign "binding agent" to prevent fugitive dusting during barge transit, FSD and the barge contractor looked at several other options:

- a) Applying a tarp to the existing barges
- b) Using deep welled hopper barges
- c) Covering the flat deck barges with a permanent tarp
- d) Covering barges with a permanent covering
- e) Enclosing barges with a permanent covering
- f) Use of a transshipper or laker vessel

The pros and cons of each option were reviewed and evaluated. Discussions were held with barge operators, shareholders and customers as to perspectives on technical feasibility, returns on investments and overall tolerance of the change. Comparisons were made on

- a) effectiveness of addressing the fugitive dust concerns
- b) size of barge and impact on operation and transit
- c) safety of proposed options

- d) fixed cost of option or retrofit including impact on loading and receiving terminal
- e) variable operating cost of option including impact on loading and receiving terminal
- f) Project design changes required to accommodate the dust mitigation option

After careful review it was concluded that applying an environmentally benign “binding agent” to prevent fugitive dusting during barge transit offered the best combination of proven effectiveness, technical feasibility, safety, cost and impact on design and operational plans for the other elements of the Project.

Primary Challenges With Other Options

Although the pros and cons of each option were reviewed and summarized independently some key challenges were identified across the other alternatives. The most significant barrier was the technical feasibility and impact on design of other elements of the Project. Cost also became a factor and at the current volumes being proposed, an appropriate return on investment and acceptable operating margin could not be achieved.

Feasibility of Modification

The barges for this project are 8000 tonne. They are literally the length of a football field. Currently there are no barges in this size class that are covered. To cover them would require a new, unproven design to be developed and implemented. Trying to achieve this modification on this barge class would require a full redesign (ballast needs, modifications of the deck & walls) and would take a considerable amount of time. This design change would be required on 8 existing barges.

Covering barges create ballast stability issues as the barges become top heavy and are more prone to listing. Coverings could also trigger some confined space issues for workers and improper ventilation of the coal.

Impact of Barge Modification

Changes to barge design would require a significant change to the loading and unloading protocols at the receiving and loading terminal. The load out system at FSD would need to change such that these coverings could be opened, stored and or lifted.

The cargo capacity of the barge would be significantly reduced, especially for hard coverings, thus requiring the addition of more barges to accommodate the supply chain logistics. The height of the pile in the barge would have to be reduced and the space available to store the product is less. In addition to increasing overall vessel traffic, these barges would be difficult to use in other trade lanes and would impact the efficiency of multi directional movements.

The unload system at the receiving terminal would require considerable changes to accommodate this type of barge and continue with their current core material hauls. These barges require the use of automated conveyor systems for reclaim and unload. It will greatly reduce off load speeds of loaders, grabs or direct conveyance.

The receiving terminal would also have challenges accessing the coverings and would require elaborate equipment to accommodate the needs of opening, closing and or storing the coverings. There are shoreline encumbrances at Texada which would prevent them from accessing the coverings. In addition, if they chose to use these barges in other services those same changes would be required at other facilities they service.

Impact of Barge Size

The existing 8000 tonne barges planned for these trade lanes are currently used to haul product from Texada Island to Richmond. They currently return to Texada empty. The proposed plan is to load these barges with coal thus using the existing equipment in a more sustainable and environmentally conscious way. It does not appear that modified barges could be easily used in the other trade lanes. As a result the current barge traffic proposed would essentially double.

Modified barges would have to be a significantly smaller class to enable the reengineering to be feasible. This class of barge would be in the 3000 to 4000 tonne range. As a result the current number of barges currently being proposed would have to double. This would not only have impacts on loading and unloading times but also increase the amount of barge movements on the Fraser River.

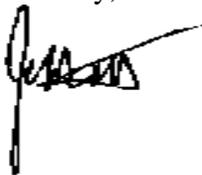
Impact of Cost

Significant changes are required at the receiving terminal to accommodate the modified barges. Minimum changes at the receiving terminal would be in the \$3-4 million dollar range.

The current barges cannot be practically modified. If new barges were required the costs would be significant. There are currently none of this scale and size available on the market. It is estimated the minimum cost of each barge to be \$4 million making the cost of all 8 barges at least \$32 million. This new barge type would introduce a new fleet of vessel traffic on the river and have ramifications on all components of the industry. The cumulative cost of the impact would be substantial.

All in all the cumulative impact of the changes would be in the \$40 million dollar range. This would be an impact in the range of \$10 a metric tonne compared to roughly \$0.25 a metric tonne of the option being proposed.

Yours truly,



FRASER SURREY DOCKS LP

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