



PORT METRO
vancouver

Project and Environmental Review Report

PER No. 2012-072-1

Fraser Surrey Docks

Direct Transfer Coal Facility -
Amendment

*Prepared for: **Project and Environmental Review Committee***

*Date: **November 20, 2015***

*Prepared by: **Tim Blair, Senior Planner***

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		VANCOUVER FRASER PORT AUTHORITY (VFPA) PROJECT AND ENVIRONMENTAL REVIEW REPORT	
PER No.:	2012-072-1		
Tenant:	Fraser Surrey Docks		
Project:	Direct Transfer Coal Facility - Amendment		
Project Location	11060 Elevator Road, Surrey BC, V3V 2R7		
VFPA SID No.:	SUR 364		
Land Use Designation:	Port Terminal		
Applicant:	Jurgen Franke, Director, Engineering & Terminal Development		
Applicant Address:	11060 Elevator Road, Surrey BC, V3W 2R7		
Category of Review:	D		
Recommendation:	That PER No. 2012-072-1 for the Direct Transfer Coal Facility Amendment be approved.		

1. SCOPE OF PROJECT REVIEW

The Vancouver Fraser Port Authority (VFPA), a federal port authority doing business as Port Metro Vancouver (PMV), manages lands under the purview of the *Canada Marine Act*, which imparts responsibilities for environmental protection. VFPA accordingly conducts project and environmental reviews of works and activities undertaken on these lands to ensure that the works and activities do not result in significant adverse environmental effects. This project and environmental review report documents VFPA's project and environmental review of PER No. 12-072-1: Direct Transfer Coal Facility (the Project) proposed by Jurgen Franke on behalf of Fraser Surrey Docks (FSD) (the applicant).

This project and environmental review was carried out to address VFPA's responsibilities under the *Canada Marine Act*, and to meet the requirements of the *Canadian Environmental Assessment Act, 2012* (CEAA 2012), as applicable. The proposed project is not a CEAA 2012 "designated project" and an environmental assessment as described in CEAA 2012 is not required. However, VFPA authorization is required for the proposed project to proceed and in such circumstances, where applicable, Section 67 of CEAA 2012 requires federal authorities to assure themselves that projects will not result in significant adverse environmental effects. This review provides that assurance. In addition, VFPA considers other interests, impacts and mitigations through the project and environmental review.

The project and environmental review considered the amendment application along with supporting studies, assessments and consultation activities carried out or commissioned by the applicant, as well as other information provided by the applicant. In addition, this project and environmental review considered other information available to VFPA and other consultations carried out by VFPA. A full list of information sources germane to the review is provided in Appendix B.

This project and environmental review report is NOT a project authorization. It is a prerequisite to the issuance of a project permit (the permit) and the conclusions described in this report require compliance with the conditions in the permit.

The scope of this review is limited to the elements of a previously authorized project that have changed since the original authorization under project permit 2012-072 was issued on August 21, 2014. It does not constitute a review of the entire project, or the impacts of the entire project.

This document forms an addendum to the previously issued Project Review Report, Environmental Review Decision Statement, and third party reviews. The attached and referenced project permit (2012-072-01) replaces the previously issued permit (2012-072), which has been superseded.

2. PROJECT SUMMARY

FSD, a multipurpose marine terminal located on the Fraser River in Surrey, British Columbia proposes to modify the list of works authorized in 2014 by project permit 2012-072. The proposed modifications relate to the types of vessel anticipated to be used to move the commodity from the facility, and to the type and arrangement of equipment required to move the commodity from the rail dumper building to the berth face for loading on vessels, which are affected by the change in proposed method of shipping.

While the previously authorized project contemplated the use of barges to move coal from the terminal, the amendment contemplates the use of ocean going vessels (OGVs) or barges. While the type of activity and volume of commodity previously authorized remain unchanged, many of the physical works have been modified because of a change in potential vessel size, which requires the installation of a taller ship loader with a longer reach. To accommodate the larger ship loader, the conveyance system, receiving pit and rail tracks need to be shifted to achieve proper conveyor angles and elevations. The overall concept for receiving, rail transfer, conveyance and dust mitigation processes remain the same as originally permitted.

The OGVs proposed to be used at the facility are Panamax class vessels with a 225m Length, 32m beam, and a maximum load capacity of 80,000 deadweight tonnes (DWT). At the facility, these vessels are proposed to be loaded to a maximum of 54,000 tonnes, to a maximum draft of 11.5m, within the limits outlined by the existing VFPA Navigational Channel Guidelines for the Fraser River. No capital dredging or channel modifications would be required in support of, or as a result of, the proposed amendment.

Components of the project which remain unchanged

- The proposal to export up to four million metric tonnes (MMT) per year;
- The number and handling of trains required to deliver coal to the facility;
- The proposal to operate as a direct transfer, meaning that the transshipment of the commodity is to be direct from land to water (rail to ship or barge) without being stockpiled at the terminal;
- The majority of works to modify rail and add track in the Port Authority Rail Yard (PARY) which is located adjacent to the terminal to the east; and
- The proposed handling processes and equipment, including the application of water or dust suppressant for washdown or dust suppression purposes.

Proposed physical changes to previously authorized works

- A taller and longer ship loader that can accommodate OGVs or barges, with an outreach of 27.4m and a height of 36.2m, vs. the original 14.3m outreach and 15.0 height;
- Relocation of the transfer station between the out feed conveyor and the ship loader away from the berth face (east) by 23.8m and downriver (south) by 55m;
- Mounting the ship loader control room above the out feed conveyor transfer point;

- Relocation of the rail receiving building and associated infrastructure 12m east and 16m south, and steel building cladding;
- Realignment of the rail loop track to the north;
- Shifting and rotating Waste Water Settlement Basins by 37m to the west and 90 degrees in a counter clockwise direction, respectively. Both basins would reside under the Out Feed Conveyor to create better effective use of space and water management practices;
- Realignment of the Out Feed Conveyor angle with respect to the receiving pit by 24 degrees, which in turn increases the length of the conveyor by approximately 40m;
- Relocation of the waste water settlement basins and a reconfiguration of the storm water catchment area;
- Incidental changes to several track switches in the PARY, near the intersection of Plywood Road; and
- Relocation of power and domestic sanitary lines running near Shed 4 and on the along the boundary between FSD and the former Bekaert site.

Other operational and miscellaneous changes as a result of the application for amendment

- The number of loaded transits anticipated to be generated by the proposed amendment changes from a maximum of 640 using barges, to 80 using OGVs;
- Removal of existing Shed 4 and the related valve station is now required as a result of the rail loop track relocation;
- The truck scale on Elevator Road is no longer displaced by the project and is consequently no longer required to be removed;
- The overall water catchment area for the coal facility footprint is decreased from 5,340 m² to 3,680 m²;
- The anticipated employment levels generated by the proposal have increased from 25 to 45 FTE;
- The anticipated capital cost of the investment has increased from \$15 million to approximately \$50 million as a result of more precise construction cost estimates, and the significantly larger loader required, and;
- The Applicant has requested a longer time horizon in which to construct the works, an increase from three years to five years.

The modifications to the proposal and the resulting design precipitated from a desire by the terminal to become more flexible due to changing market conditions, and to allow them access to a greater range of shippers or buyers of coal. Loading to OGVs allows the commodity to be shipped directly to overseas buyers without the need for double handling at another facility as required with a barge loading scenario.

It is noted that depending on vessel size, vessels may be partially loaded to a draft of up to 11.5m due to draft restrictions in the river. The vessels are not anticipated to be topped up at other coal terminals, but are anticipated to be sailed direct to their destination at a partially loaded draft of 11.5m. FSD wishes to retain the ability to ship coal by barge should market conditions demand it, and have proposed modifications to the equipment that would allow loading to either OGV or barge.

Equipment specified at the berth face and elsewhere on the terminal for the suppression of dust while handling the commodity is not proposed to be modified, though the need for its use is anticipated to be lessened as a result of loading to ships. This is due to the nature of OGVs which are equipped with holds that can be closed during transit, lessening the need for water or suppressant additives that would be required to stabilize the product during transit on an open barge.

Studies that were supplied in support of the application to amend the existing permit included those listed below. Some documents were supplied as an addendum to the original, and some were supplied as updates that replace the reports referenced in support of the original application. The studies are as follows:

- Environmental Impact Assessment (Addendum)
- Air Quality Assessment (Addendum)
- Human Health Risk Assessment (Addendum)
- Risk Assessment Update for Coal Operation (Update)
- Construction Environmental Management Plan (Addendum)
- Direct Transfer Coal Facility Water Management Plan (Addendum)
- Direct Transfer Coal Facility Spill Response Plan (Update)
- Direct Transfer Coal Facility Fire Life Safety Plan (Update)

3. PROCESS OVERVIEW

The Project and Environmental Review for the proposed amendment was undertaken over two phases. The initial phase consisted of public consultation, and was undertaken by FSD prior to submission of a formal application. The second phase was undertaken after submission of a complete Project Review application, and consisted of a second consultation effort by FSD, conducted concurrently with VFPA internal and external technical review and other VFPA-led consultation activities.

The table below provides a high level timeline and summary of activities conducted during each phase.

May 2015 to July 2015	Pre-application Comment Period
May 2015	Pre-application consultation activities conducted by FSD including posting material to FSD website, targeted outreach, and aboriginal engagement activities
Consultation and Technical Review	
July 2015	Application submission, and confirmation of application completeness and referral to outside parties for comment
July 2015	Posting application material to VFPA and FSD websites, targeted outreach by FSD, and the commencement of Public Consultations
July 2015	Commencement of VFPA Municipal, Stakeholder, and Aboriginal Consultation, and Third Party Review by Golder Associates
July 2015	Two stakeholder consultation meetings hosted by FSD
August 2015	Receipt of results of 3 rd party review by Golder Associates Ltd.
August 2015	Conclusion of public consultation, and preparation of the Consultation Summary Report

September 2015	Posting of Consultation Summary Report detailing the results of Public Consultation
November 2015	Conclusion of technical review and Aboriginal consultation

3.1 Planning Review

The Planning and Development Department coordinated the review of the proposal, including technical review and VFPA-led consultation activities. Technical review included input from Environmental Programs, Marine Operations, and Community & Aboriginal Affairs.

Land Use Designation

The proposed amendment remains consistent with the designation of the site, which is Port Terminal under the VFPA Land Use Plan.

Operational Activities

The proposed amendment is not expected to significantly affect surrounding tenants or communities. Dust suppression activities are not proposed to change, though as noted elsewhere the need for use of these is anticipated to be lessened as a result of loading to ships because OGVs are equipped with holds that can be closed during transit, lessening the need for water or suppressant additives that would be required to stabilize the product during transit on an open barge. Permit condition 9 has been modified to reflect the need to keep dust generation when loading vessels to minimum levels.

Ship noise from Panamax sized ocean-going vessels is anticipated to be comparable to the noise currently generated by similar sized vessels that currently berth at FSD, and additional mitigations are not anticipated to be required as a result of the amendment.

Equipment loading as a result of the larger slewing conveyor has been reviewed, and it remains the responsibility of the proponent to ensure that loading and surface wear from the ship/barge loader remains within acceptable criteria.

Construction Activities

The proposed amendment does not anticipate significantly changed construction methods, with only slight modifications to the layout of the facility to enable transfer of the commodity from rail to ship.

Building Permit

Issuance of a building permit remains a requirement under the proposed arrangement, for the Rail Receiving Shed and Electrical Control Rooms. The proposed changes to the facility do not affect the scope of the review. FSD has submitted a building permit application, which is being reviewed by Gage Babcock & Associates on behalf of VFPA.

3.2 Environmental Programs

The environmental review of the Project is detailed in the companion document, the Environmental Review Decision Statement.

3.3 Marine Operations

Marine Operations reviewed the proposed amendment, and required that FSD prepare an update to the *Risk Assessment Study for Coal Barge Operation* prepared by Det Norske Veritas (DNV) in 2012 in support of the original application. The updated study by DNV is titled *Risk Assessment Update for Coal Operation*, and is dated May 26, 2015. This updated study considers the updated risk profile for 2016, based on the proposed change in shipping method from barges to ships.

The updated assessment concludes that marine incidents are expected to occur most frequently when all barges are used in transit and least frequently when OGVs are used. Generally, marine risk in the Fraser River correlates with the number of vessels that travel the Fraser River, with more vessels resulting in more risk of an incident, whether that be a grounding, spill, or other mishap.

The assessment also recommends that several Risk Management Options be considered for implementation to actively reduce risk of marine shipments, if deemed cost efficient. These options are outlined in the below table:

Category	Risk Management Options
Equipment Selection and Inspection Operational Aspects	<ul style="list-style-type: none"> • All operational vessels will be inspected at regular intervals to ensure they meet Transport Canada regulations. • Operations will not be conducted in high wind conditions in order to lessen the chances of an accident. The criteria will be defined in broad terms leaving room for taking into account operator experience. • All night time operations will follow mandatory lighting and manning requirements. • Require tankers to conduct pre-arrival tests and inspections on critical systems before entering or operating in more restrictive waters in the study area • Pilotage for FSD vessels
Management	<ul style="list-style-type: none"> • Strong safety culture with management system support

Marine Operations has reviewed this updated assessment and has no outstanding navigational concerns with the proposed change, provided that the proposed mitigations as outlined in the 2012 assessment, 2015 updated assessment, and as required under the 2014 project permit, are implemented. Reference to these has been included in amended condition 67.

4. CONSULTATION

The proposed permit amendment was assessed by the Planning Department and Community and Aboriginal Affairs Department to have potential impacts to adjacent residents and the local community, particularly along the marine transit route. Therefore, the applicant was required to conduct public consultation activities of a scope appropriate to the amendment sought.

In addition, the applicant was required to undertake a round of preliminary consultation to gather input on the scope of the studies proposed to be updated or supplied with addendums, prior to submitting an application to amend the existing permit. This approach was consistent with the revisions to the Project and Environmental Review Process, launched shortly after the application for amendment was submitted.

4.1 Municipal Consultation

The proposed Project amendment application was assessed by the project team to have potential impacts to municipal interests.

A project referral letter was sent to the following municipalities on July 24, 2015 notifying them of the proposed amendment and seeking their input on the application:

- City of Surrey
- Corporation of Delta
- City of New Westminster
- City of Richmond

VFPA received written responses from all four municipalities.

In addition, the Corporation of Delta provided comments prior to the receipt of an application package from FSD, during the pre-application phase when FSD was collecting early feedback on the scope of the proposed studies.

Below are two tables summarizing the comments received and how they were considered as part of the project and environmental review.

Comments	VFPA's consideration of input
A 6-week consultation period was requested, as well as a public information session as part of the consultation process. There was concern with consultation being conducted at a time of the year which may result in low participation.	VFPA has required the applicant to extend the consultation process to 25 business days, which exceeds current VFPA practices of 20 business days. Two targeted stakeholder meetings were held as part of the consultation process. The applicant has followed reasonable guidelines for notification and consultation.
Suggestions were made about VFPA's consultation process. Suggestion was made that VFPA revoke the previously issued permit and re-review the project as a whole under the PER process.	The consultation activities are conducted in a very similar manner to those conducted by municipalities. Project applicants are expected to prepare materials, host activities, or reach out to stakeholders, solicit feedback and submit all consultation materials for VFPA's review. VFPA, as the regulator, is responsible to observe and answer questions about the review process VFPA focuses its review on the portions of the project that have changed, and has directed that the applicant update or addend applicable studies to demonstrate that significant environmental effects are not introduced by the amendment proposal.
Concerns were raised about air quality assessment and management.	VFPA has a well-established and robust procedure for assessing environmental impacts, including those associated with air quality, from activities within its jurisdiction and is the responsible authority for determining appropriate actions and mitigation measures. VFPA has required the applicant to undertake an Air Emissions Management Plan as a condition of

	the existing permit and has committed to share the draft plan to stakeholder agencies for technical feedback only.
Concerns were raised about coal dust on human health and called for the completion of an HHRA based on a scope that had been directed by the Health Authorities.	<p>The Human Health Risk Assessment previously conducted by FSD is sufficient for VFPA to have confirmed that with the implementation of proposed mitigation measures, the 2014 project was not likely to cause significant adverse environmental effects, and that it is our assessment based on updated studies that the proposed changes will not result in a different conclusion.</p> <p>The Fraser Health Authority and Vancouver Coastal Health were invited to comment on the proposed scope of the study addendums, and have been consulted on the proposed scope of the HHRA specifically</p>
Concerns were raised with respect to stormwater management and the likelihood of an overflow to the Fraser River.	The applicant is responsible for securing authorization from Metro Vancouver for the permit to discharge this water, at maximum volumes and in conformance with other criteria established by the operator of the collection and treatment system for waste water region-wide. Should authorization to discharge not be achieved, the applicant is responsible for proposing an alternate method, as regulated under the existing project permit. Further, VFPA requires that all containment area discharge structures that could potentially discharge to the Fraser River be fitted with manual shut-off devices that can be operated in the event of a power failure.
Suggestions were made about the scope of EIA	VFPA confirmed the appropriate scope of the Environmental Impact Assessment.
Concerns were raised about potential blockage of vehicle access to Crescent Beach	Transport Canada is responsible for operation and regulation of railways in Canada, they are aware of the concern.
Additional information was requested relating to the type of coal or commodities handled.	Dust generation properties or environmental characteristics of the different types of coal that could be handled by FSD or by other terminals do not differ sufficiently that VFPA would need to regulate them. Provided that a terminal adheres to established industry best practice and mitigation measures, they are able to handle bulk commodities within the approved class, and below the maximum annual tonnage that has been reviewed. This is no different for different types of grain, potash, or oil for example that may be handled at a bulk facility

4.2 Regional Agency Consultation

The proposed project was assessed by Planning and Environmental Programs to be of potential interest to regional agencies. A referral letter was sent to the following regional agencies on July 24, 2015 notifying them of the proposed Project, and soliciting their feedback on the application:

- Metro Vancouver
- Fraser Health Authority

- Vancouver Coastal Health Authority

VFPA received written responses from Metro Vancouver and a joint response from the Health Authorities. In addition, Metro Vancouver provided comments prior to the receipt of an application package from FSD, during the pre-application phase when FSD was collecting early feedback on the scope of the proposed studies.

Below are two tables summarizing the comments received and how they were considered as part of the project and environmental review.

<i>Regional Agency Comments (received prior to the application being submitted)</i>	<i>VFPA Considerations</i>
<ul style="list-style-type: none"> • It was requested that VFPA undertake consultation in advance of the studies being undertaken 	<ul style="list-style-type: none"> • VFPA agree with this request, and required that FSD undertake pre-application consultation on the proposed scope of studies
<ul style="list-style-type: none"> • It was requested that VFPA require a more lengthy 6 week and two stage consultation process, and hold public information meetings in four municipalities 	<ul style="list-style-type: none"> • VFPA agreed with a longer consultation period and required FSD to extend to 5 weeks, rather than the requested 6 • FSD proposed that two stakeholder meetings be held in Surrey as part of the consultation process, and VFPA agreed with that approach
<ul style="list-style-type: none"> • It was requested that VFPA require a Human Health Risk Assessment be conducted based on a terms of reference supported by the local health authorities 	<ul style="list-style-type: none"> • VFPA required that FSD undertake an addendum to the previously submitted Environmental Impact Assessment (EIA), Air Quality Assessment (AQA) and Human Health Risk Assessment (HHRA)

<i>Regional Agency Comments (received during the review process)</i>	<i>VFPA Considerations</i>
<ul style="list-style-type: none"> • Concerns were expressed about the range of air quality and health impacts that might need to be modelled given FSD's stated intent to use either barges or OGVs, or a variable combination thereof 	<ul style="list-style-type: none"> • VFPA confirmed that comparing barge to ship traffic would not provide meaningful data, as combustion emissions are more significant than barge emissions yet barge fugitive emissions are more significant than ship. This has been confirmed to our satisfaction by the data produced by FSD in support of the amendment application (the AQA)
<ul style="list-style-type: none"> • Suggestions were made that the 100% OGV scenario and 100% barges/tug scenario could not be considered true "bookends" of the full range of impacts, and that more in depth analysis was required 	<ul style="list-style-type: none"> • VFPA confirmed that comparing barge to ship traffic would not provide meaningful data, as combustion emissions are more significant than barge emissions yet barge fugitive emissions are more significant than ship. This has been confirmed to our satisfaction by the data produced by

	FSD in support of the amendment application (the AQA)
<ul style="list-style-type: none"> Concerns were expressed that in the absence of new dispersion modeling, it is not possible to make any conclusions regarding potential impacts of Panamax OGV emissions along the transportation route 	<ul style="list-style-type: none"> The potential impacts for movements of tugs and ships along the Fraser River was assessed in section 6.1 of the updated AQA in terms of overall emissions. The size and type of vessels proposed to transit along the Fraser River under this project are consistent with the vessels currently transiting the river and additional impacts are not anticipated.
<ul style="list-style-type: none"> Concerns were expressed that an assessment of health risks associated with diesel particulate matter emissions from the project had not been completed 	<ul style="list-style-type: none"> The scope for the assessment satisfies the requirements of VFPA's project and environmental review process. Ocean going vessels and emissions related to the combustion of diesel are not a new source along the Fraser River that has a long history of vessel activity. Annual emissions from ocean-going vessels in-transit have been included in the AQA Addendum
<ul style="list-style-type: none"> Concerns were expressed that neither the original application HHRA nor the amendment HHRA addendum determine cancer risks associated with inhalation of the gases formaldehyde and naphthalene, or cancer risk associated with multipath way exposure to total chromium metal. 	<ul style="list-style-type: none"> The scope for the assessment satisfies the requirements of VFPA's project and environmental review process.
<ul style="list-style-type: none"> A variety of concerns were expressed with the background data employed in the HHRA, and the addendum. 	<ul style="list-style-type: none"> When considering chronic risks to the majority of the metal Contaminants Of Potential Concern, project Health Quotients were generally two to three orders less than the Baseline HQs. The scope for the assessment satisfies the requirements of VFPA's project and environmental review process.
<ul style="list-style-type: none"> Concerns were expressed about the scope of studies completed 	<ul style="list-style-type: none"> VFPA confirmed that it was careful in considering which of the existing studies was required to be updated, or addended to, for the purposes of the application. The extent to which coal may be exported or not is outside VFPA's jurisdiction under the <i>Canada Marine Act</i>; therefore, the effects of any use of coal, if exported, are not directly linked or necessarily incidental to VFPA's exercise of power concerning the project permit.

4.3 Federal & Provincial Agency Consultation

The proposed Project was assessed by Planning and Environmental Programs to be of potential interest to Federal and Provincial agencies. A referral letter was sent to the following Federal and Provincial agencies in July, 2015 notifying them of the proposed Project and requesting any comments:

- Health Canada
- Transport Canada
- Department of Fisheries & Oceans
- BC Forest, Lands and Natural Resource Operations (FLNRO)
- BC Ministry of Energy and Mines

Several agencies responded to the referral. Below is a table summarizing the comments received and how they were considered as part of the project and environmental review.

<i>Federal and Provincial Agency Comments</i>	<i>VFPA Considerations</i>
<ul style="list-style-type: none"> • Health Canada was consulted and responded that in its advisory role under the CEAA 2012, it would not undertake a full review of the amendment application 	<ul style="list-style-type: none"> • None required
<ul style="list-style-type: none"> • Transport Canada was consulted and responded notifying VFPA that the project appeared to trigger the need for submission of <i>Notice of Work</i> under the Navigation Protection Program 	<ul style="list-style-type: none"> • VFPA advised FSD to make application to Transport Canada under the Navigation Protection Program
<ul style="list-style-type: none"> • Department of Fisheries and Oceans was consulted and responded confirming that VFPA and DFO do not have a coordinated review process, and that project proponents are required to determine whether an Authorization is required 	<ul style="list-style-type: none"> • None required
<ul style="list-style-type: none"> • BC Forest, Lands and Natural Resource Operations (FLNRO) was consulted and did not respond 	<ul style="list-style-type: none"> • None required
<ul style="list-style-type: none"> • BC Ministry of Energy and Mines was consulted and did not respond with comments 	<ul style="list-style-type: none"> • None required

4.4 Stakeholder & Marine User Consultation

The proposed Project was assessed by Planning and Development not to have potential impacts to adjacent VFPA tenant operations. A referral was therefore not circulated to adjacent tenants.

The proposed Project was assessed by Marine Operations to have potential impacts to marine users. A referral letter was sent to the Marine Users Group consisting of those listed below on July 24, 2015 notifying them of the proposal:

- Pacific Pilotage Authority
- Fraser River Pilots Committee
- Council of Marine Carriers

- Transport Canada Navigation Protection Program
- BC Chamber of Shipping
- Shipping Federation of Canada

Marine Users Group members provided limited response to the proposed Project amendment. Below is a table summarizing the comments received and how they were considered as part of the project and environmental review.

<i>Marine Users Group Comments</i>	<i>VFPA Considerations</i>
<ul style="list-style-type: none"> • The Pacific Pilotage Authority requested that the project be placed on the next scheduled agenda of the monthly meeting between VFPA, the Fraser River Pilots, and the PPA for discussion 	<ul style="list-style-type: none"> • The item was discussed with members of the Fraser River Pilots Committee and Pacific Pilotage Authority on September 1, 2015
<ul style="list-style-type: none"> • Fraser River Pilots commented that the proposal to use Ocean Going Vessels represented the use of a conventional sized ship which is routine 	<ul style="list-style-type: none"> • As above
<ul style="list-style-type: none"> • BC Chamber of Shipping thanked VFPA for the referral 	<ul style="list-style-type: none"> • None required
<ul style="list-style-type: none"> • The Shipping Federation of Canada was consulted but provided no comments 	<ul style="list-style-type: none"> • None required
<ul style="list-style-type: none"> • The Council of Marine Carriers was consulted but provided no comments 	<ul style="list-style-type: none"> • None required

*Transport Canada responded as noted under section 4.4 above.

4.5 Aboriginal Consultation

Objectives

The Objectives of the Aboriginal consultation process are:

- To fulfill the Crown's legal duty to consult with Aboriginal groups;
- To provide updates and share information about the proposed project as they become available, including all relevant documents;
- To work with Aboriginal groups to either avoid or determine appropriate mitigation of potential project impacts to Aboriginal and Treaty rights where required;
- To provide information to the project team and the Applicant with respect to issues raised by Aboriginal groups and in the development of responses to enquiries;
- To encourage the Applicant to explore business and employment opportunities with Aboriginal groups.

Scope of Consultation

Fraser Surrey Docks Direct Transfer Coal Facility falls within the asserted traditional territory of the following Aboriginal groups:

- Musqueam Indian Band
- Tsleil-Waututh Nation
- Katzie First Nation
- Semiahmoo First Nation
- The Sto:lo Collective, as represented by People of the River Referrals Office (PRRO)
 - Sto:lo Tribal Council
 - Sto:lo Nation
- Hwlitsum First Nation
- Hul'qumi'num Treaty Group
 - Cowichan Tribes
 - Halalt First Nation
 - Stz'uminus First Nation
 - Penelakut First Nation
 - Lyackson First Nation
 - Lake Cowichan First Nation

The project also falls within the traditional territory of the Tsawwassen First Nation and lies within their Fishing Area, Migratory Bird Area, and Wildlife Area as defined in the Tsawwassen First Nation Final Agreement.

The project is also located in the Aboriginal Fisheries Strategy Fishing Licence area of Qayqayt First Nation (salmon), Musqueam Indian Band (salmon), and Tsawwassen First Nation (salmon).

All Aboriginal groups listed above were consulted on the proposed project amendment.

Overview of Consultation Activities

Upon receipt of an accepted Project Application, Aboriginal Affairs reviewed the proposed project amendment to determine whether it necessitated consultation with Aboriginal groups. A Pre-Consultation Report was completed and approved by the Manager Aboriginal Affairs, and it was determined that the duty to consult was triggered. PMV led the Aboriginal consultation activities on the proposed project amendment.

Consultation activities included sending referral packages, response letters and emails to Aboriginal groups, in addition to meetings with Aboriginal groups to provide an overview of FSD's proposed project amendment and PMV's Project and Environmental Review Process, and an opportunity to hear concerns from Aboriginal groups about the potential impacts of the proposed project amendment on Aboriginal and Treaty rights.

All letters and enquiries from Aboriginal groups were considered and responded to by PMV.

All Aboriginal groups listed in Scope of Consultation above were consulted in the following manner:

Pre-Application Phase: In advance of a formal project application from FSD, PMV notified Aboriginal groups that FSD would be seeking an amendment to change the approved loading equipment in order to change the method of shipping without increasing coal volume in their existing Direct Transfer Coal Facility Project Permit (PP 2012-072), issued on August 21, 2014. PMV also notified Aboriginal groups that FSD was commencing a public outreach process and encouraged Aboriginal groups to participate.

Application Review Phase: On July 22, 2015, PMV sent Aboriginal groups a complete referral package regarding FSD's proposed project amendment to the Direct Transfer Coal Facility Project Permit (PP 2012-072) for their review and comment. The package included a letter, project summary, an overview map and site plan, and the following revised studies:

- Appendix 7: Technical Memo: Rail & Vessel Operations Model
- Appendix 9: Addendum Report to the Human Health Risk Assessment
- Appendix 10: Environmental Impact Assessment Addendum
- Appendix 11: Air Quality Assessment Addendum
- Appendix 13: Risk Assessment Update for Coal Operation
- Appendix 14: Construction Environmental Management Plan
- Appendix 16: Water Management Plan Addendum
- Appendix 17: Spill Response Plan
- Appendix 20: AOA Fraser Surrey Docks, Draft AOA Deliverable Date
 - A revised Archaeological Overview Assessment was provided to Aboriginal groups on August 11, 2015.

The letter explained that the amendment proposal was to modify the approved loading infrastructure to allow for a change in method of shipping without increasing the coal volumes handled at the terminal. PMV explained that it was FSD's intent to be able to load coal to ocean-going vessels (OGVs) or barges. The letter also provided an overview of PMV's Project and Environmental Review process and requested initial comments from Aboriginal groups by September 2, 2015.

All materials were shared with Aboriginal groups through PMV's file exchange site, Serv-U. Hard copies followed by mail.

Participation Funding

PMV offered and provided participation funding to Aboriginal Groups on a case by case basis.

Overview of Comments Received from Aboriginal Groups

Comments provided by Aboriginal groups during consultation included concerns regarding impacts to archaeological resources, impacts to ability of Aboriginal groups to fish due to increased traffic in the Fraser River, impacts resulting from the potential introduction of invasive species, impacts of bilge water discharge, concerns that the Human Health Risk Assessment ("HHRA") did not consider Aboriginal peoples, concerns regarding HHRA exceedances, and cumulative impacts of traffic on the Fraser River.

Aboriginal groups also expressed process concerns including the scope of PMV's Project and Environmental Review process, lack of involvement of other agencies, arbitrary timelines imposed on Aboriginal groups, and insufficient participation funding.

One Aboriginal group advocated their right to "free and informed consent prior to the approval" citing the United Nations Declaration on the Rights of Indigenous Peoples and asked that PMV justify the infringement on their Aboriginal right to fish.

Potential Impacts Expressed by Aboriginal Groups

The following potential impacts were communicated by Aboriginal groups participating in the consultation process. The potential impacts are noted in *italics* followed by a short explanation and PMV's response to the potential impact.

Potential Impact of Vessel Traffic on Aboriginal Right to Fish – Aboriginal groups expressed concern that increased vessel traffic resulting from the project will adversely impact their ability to exercise their Aboriginal right to fish. PMV is of the view that the anticipated increase in vessel traffic – approximately 80 vessels/160 transits per year – will not result in significant adverse impacts to the ability of Aboriginal groups to exercise their Aboriginal right to fish. PMV also notes the Applicant's continued commitment, made under the original project permit, to work with Aboriginal groups on a Marine Notification Protocol to advise Aboriginal fishing vessels of related commercial movements during fishing openings.

Potential Impact of Spills on Aboriginal Right to Fish – Aboriginal groups expressed concern about the potential for a spill, of either coal or fuel from ships, to have an adverse impact on fish and fish habitat, thus impacting their ability to exercise their Aboriginal right to fish. Similarly, Aboriginal groups expressed concern about emergency and spill response. PMV is of the view that with specific project conditions in place these impacts can be mitigated. This includes the requirement that the Applicant maintain a current Spill Response Plan and provide to PMV a written submission confirming that the risk assessment strategies outlined in the Risk Assessment Study be implemented during ongoing operations over the life of the project.

Potential Impacts to Archaeological Resources – PMV required FSD to update its Archaeological Overview Assessment ("AOA") due to changes in the proposed project design. Aboriginal groups were provided with the updated AOA on August 11, 2015. The AOA results deemed the potential for both the presence and impacts to archaeological resources to be low. No further archaeological study was recommended, however, a Chance Find Procedure was drafted per the original project permit.

Concerns were also expressed regarding the potential for increased wake to impact cultural resources along the vessel route, however as the frequency of deep-sea vessel traffic on the Fraser River is currently less than historic levels, and the increase in vessel wake resulting from the proposed project amendment would be one additional vessel every 4.5 days along the Fraser River, PMV is of the view any potential adverse impact due to wake would not be significant and increased shoreline erosion is not anticipated. Furthermore, the deep-sea navigation channel of the Fraser River is designed in consideration of shoreline erosion effects, and the shoreline erosion effects of vessels operating within the Fraser River deep-sea navigation channel, within the design vessel parameters, are considered negligible. This is largely attributed to the expansive network of river training structures and erosion protection works that exist throughout the waterway system.

Potential Impacts from the Introduction of Invasive Species – Aboriginal groups expressed concern that invasive species could be introduced into the Fraser River via ocean going vessels ("OGV's"). Existing measures are in place to address this concern, including: PMV does not permit in-water hull and propeller cleaning without stringent controls to prevent the release of fouling organisms, and Transport Canada does not permit the unmitigated release of ballast water into the local environment. OGVs arriving from overseas must file a ballast water management report with Transport Canada before entering Canadian waters, which must specify mid-ocean ballast exchanges or other treatment/management steps taken to render the ballast water innocuous from a non-indigenous species perspective. The risk is thus mitigated.

Potential Impacts from Bilge Water Discharge – Aboriginal groups expressed concern that invasive species could be introduced into the Fraser River via bilge water from ocean going vessels (“OGV’s”). Existing measures are in place to address this concern, including: PMV does not permit bilge water discharge within its jurisdiction. PMV’s Harbour Patrol officers visit OGVs when they first arrive within the port and seal the bilge discharge valves.

Potential Impacts of Air Quality on Aboriginal Peoples – Aboriginal groups expressed concern about the potential for Aboriginal people engaged in the practice of Aboriginal fishing in proximity to the project area to suffer adverse human health impacts due to air quality.

The categorization of Aboriginal fishing in the Fraser River in the vicinity of the terminal as Industrial (see page 45 of the July 18, 2015 HHRA enclosed) is significantly conservative in terms of both pollutant concentration (maximum is along the fence line and quickly diminishes further away from the terminal where fishing generally occurs) and exposure duration (48 weeks of activity within the close proximity of the terminal). This degree of conservatism thus implies that the actual level of risk is significantly reduced from the calculated levels in the HHRA.

PMV is of the view that the HHRA adequately addresses the potential risks to Aboriginal groups while fishing along the Fraser River in the vicinity of the terminal.

Potential Cumulative Impacts of Traffic on the Fraser River – Aboriginal groups requested that a study of the cumulative impact of increased commercial traffic on the Fraser River be conducted to assess the impact of more traffic on their ability to exercise the Aboriginal right to fish. As part of PMV’s Project and Environmental Review, the proposed increase in traffic was considered in the context of existing vessel traffic within the Fraser River. PMV’s review of the updated Marine Risk Assessment indicates that the proposed coal operations, using either barges or vessels to transport the commodity would not pose any substantial risk to navigation. PMV is of the view that a cumulative impacts study of increased commercial traffic on the Fraser River in addition to the assessment of safe navigation already conducted, is outside of the scope of its Project and Environmental Review of this proposed project amendment, and, as not all river traffic is attributable to PMV operations, a study of this nature would necessarily involve other levels of government.

Process Issues Expressed by Aboriginal Groups

Scope of PMV’s Project and Environmental Review process – Some Aboriginal groups considered the consultation on the proposed project amendment an opportunity to revisit the decision on the original project permit. PMV explained that it was reviewing solely the aspects of the project that are proposed to change and not its decision on the original project permit.

Lack of Involvement of other Agencies – Some Aboriginal groups felt that the proposed project amendment warranted the involvement of other agencies. PMV explained that no other agencies have a mandate or jurisdiction to review the proposed project amendment, nor was the project classified as a designated project per CEEA or BCEAO.

Insufficient Time to Review – Some Aboriginal groups expressed the opinion that PMV’s review timelines and requested response dates were arbitrary and did not provide adequate time for adequate review. PMV referred the proposed project amendment to Aboriginal groups on July 22, 2015 and requested initial comments by September 2, 2015, providing a period of 30 business days, with the expectation of receiving subsequent comments and engaging in further discussions thereafter. PMV considered all requests by Aboriginal groups for additional time. Final comments were requested by November 4, 2015. PMV developed its consultative

timeframes based on a scale of reasonableness that considers the volume of materials shared, the complexity of the project permit amendment, and the potential to adversely impact Aboriginal rights.

Insufficient Participation Funding – PMV offered and provided participation funding to Aboriginal Groups on a case by case basis.

There are no outstanding issues in regards to Aboriginal consultation comments. See the below table for the full summary of issues raised by Aboriginal Groups and PMV considerations.

Issue	PMV and/or FSD Response	PMV Considerations
<p><i>Potential Impacts of Vessel Traffic on Aboriginal Right to Fish</i></p>	<p>For the annual coal volume of 4MMT, vessel movements would consist of 80 vessels per year (160 transits).</p> <p>PMV is of the view that the proposed coal operations, using either barges or vessels to transport the commodity would not pose any substantial risk to navigation and therefore is not expected to adversely impact the Aboriginal right to fish.</p> <p>FSD has restated its commitment to developing a Marine Notifications Protocol to communicate anticipated vessel traffic to Aboriginal groups.</p> <p>FSD stated its intended goal is move to 100% vessel movements and no barges.</p> <p>The proposed increase in OGV traffic is not considered significant in the overall context of Fraser River marine traffic, as assessed by PMV Marine Operations.</p>	<p>None.</p>
<p><i>Potential Impacts of Air Quality of Aboriginal Peoples</i></p>	<p>The categorization of Aboriginal fishing in the Fraser River in the vicinity of the terminal as Industrial (see page 45 of the July 18, 2015 HHRA enclosed) is significantly conservative in terms of both pollutant concentration (maximum is along the fence line and quickly diminishes further away from the terminal where fishing generally occurs) and exposure duration (48 weeks of activity within the close proximity of the terminal). This degree of conservatism thus implies that the actual level of risk is significantly reduced from the calculated levels in the HHRA.</p>	<p>None.</p>

	<p>PMV is of the view that the Human Health Risk Assessment (“HHRA”) adequately addresses the potential risks to Aboriginal groups while fishing along the Fraser River in the vicinity of the terminal.</p>	
<p><i>Potential Impacts of Spills on Aboriginal Right to Fish</i></p>	<p>FSD has in place an Environmental Management Plan (EMP), which includes a Spill Response Plan for the terminal. They have also provided a spill response plan for the barge operator which will service the terminal.</p> <p>PMV has required that separate spill response plans be maintained for the terminal and the barge operator as conditions of the Permit.</p> <p>PMV also stated that discussions with respect to potential compensation in the event of a low probability, significant consequence event in the Fraser River caused by FSD should be discussed directly between Aboriginal groups and FSD.</p> <p>PMV stated that FSD would not be required to carry specific liability insurance to cover economic, food, social, ceremonial, and cultural loss associated with a potential loss of opportunity to harvest and practice ones culture; however, FSD would be required to carry comprehensive general liability insurance and stevedoring and wharfingers legal liability insurance which may include such coverage.</p> <p>PMV noted that Triton Environmental Consultants Ltd. (Triton) commented in FSD's Discussion Guide that "coal contains metals and Polycyclic Aromatic Hydrocarbons (PAHs) that may affect certain aquatic life under specific conditions. These conditions do not generally exist along the proposed barge route. In the event of coal entering water along the proposed barge route, metals are not expected to negatively affect aquatic life because of the nature of the water in the Fraser River and Strait of Georgia, including the relatively neutral pH, relatively quick moving current and large water volumes. Similarly, PAH are not</p>	<p>Permit Condition (existing): Submit confirmation that the risk management strategies outlined in the Risk Assessment Study for Coal Barge Operation will be implemented during ongoing operations over the life of the project.</p> <p>Permit Condition (amended): Prior to commencement of operations, the applicant shall provide a written submission confirming that should barges or vessels be used to transport coal from the terminal, the risk reduction measures outlined in the Risk Assessment Study for Coal Barge Operation dated September 26, 2012 and Risk Assessment Update for Coal Operations dated May 26, 2015 will be implemented as applicable during operations over the life of the Project.</p> <p>Permit condition (existing): In the event of a product spill into the Fraser River, the Applicant will be required to submit a Clean-up Plan to the satisfaction of the VFPA Harbour Master. Should VFPA determine that the submitted plan does not sufficiently address the carrier’s responsibilities, VFPA reserves the right to hire a contractor to remove the spilled material at the expense of the Applicant.</p>

	<p>expected to negatively affect aquatic life in the event of a spill along the proposed barge route, PAH do not readily dissolve in water."</p>	<p>Permit Condition (existing): The applicant shall maintain a current Spill Response Plan on behalf of the barge operator responsible for barge movements within VFPA jurisdiction.</p>
<p><i>Potential Impacts to Archaeological Resources</i></p>	<p>The AOA report was conducted with results that predicted low potential for the presence of archaeological resources in the project area. No further archaeological study in the project area was recommended. However, a requirement that the Applicant prepare and implement a Chance Find Procedure will be included as a Permit Condition.</p>	<p>Permit Condition (existing): Prior to commencement of construction the applicant shall prepare and implement an archaeological Chance Find Procedure as guidance during excavation activities. In the event that suspected archaeological materials are encountered during Project construction, the applicant shall immediately cease construction activities that may disturb the potential materials and notify VFPA.</p>
<p><i>Potential Impacts from the Introduction of Invasive Species</i></p>	<p>PMV does not permit in-water hull and propeller cleaning without stringent controls to prevent the release of fouling organisms, and Transport Canada does not permit the unmitigated release of ballast water into the local environment. OGVs arriving from overseas must file a ballast water management report with Transport Canada before entering Canadian waters, which must specify mid-ocean ballast exchanges or other treatment/management steps taken to render the ballast water innocuous from a non-indigenous species perspective. The risk is thus mitigated.</p>	<p>No permit conditions are required as mitigation measures are already in place under existing programs and policies.</p>
<p><i>Impacts from Bilge Water Discharge</i></p>	<p>PMV does not permit bilge water discharge within its jurisdiction. PMV's Harbour Patrol officers visit OGVs when they first arrive within the port and seal the bilge discharge valves.</p>	<p>No permit conditions are required as mitigation measures are already in place under existing programs and policies.</p>
<p><i>Cumulative Impacts of Traffic on the Fraser River</i></p>	<p>PMV is of the view that a cumulative impacts study is outside of the scope of its Project and Environmental Review of this proposed project amendment.</p> <p>The proposed increase in vessel traffic is not considered significant in the overall context of Fraser River marine traffic, as assessed by PMV Operations.</p>	<p>None.</p>

<i>Scope of PMV's Project and Environmental Review process</i>	PMV explained that it was reviewing solely the aspects of the project that are proposed to change and not its decision on original project permit.	None.
<i>Lack of Involvement of other Agencies</i>	PMV explained it is the only authority with a legislated responsibility to review FSD's proposed project amendment and that the project was not classified as a designated project per CEAA or BCEAO.	None.
<i>Insufficient Time to Review</i>	PMV referred the proposed project amendment to Aboriginal groups on July 22, 2015 and initially requested comments by September 2, 2015. PMV extended the timeline for Aboriginal groups a number of times at their request. PMV has developed its consultative timeframes based on a scale of reasonableness that considers the volume of materials shared, the complexity of the project, and the potential to adversely impact Aboriginal rights.	None.
<i>Insufficient Participation Funding</i>	PMV offered and provided participation funding to Aboriginal Groups on a case by case basis.	None.

Conclusion

PMV has made a meaningful effort to consult with all potentially affected Aboriginal groups to understand and consider how the proposed amendment to the existing permit may adversely impact the asserted and established Aboriginal and treaty rights of the Aboriginal groups noted in the Scope of Consultation section above.

Based on the record of consultation, the responses provided by PMV regarding matters raised by Aboriginal groups, and upon meaningful consideration by the Project and Environmental Review Committee of the options presented as part of the decision, the Manager of Aboriginal Affairs is of the view that the duty to consult has been met.

4.6 Public Consultation

VFPA Planning and Development and Project Communications reviewed the proposal and determined that public consultation was required as part of the Project Review Process given that the proposed project amendment may have the potential to have dust, noise and light impacts on surrounding communities and along the marine transit route.

Consultation and engagement activities conducted by FSD, the applicant, included two distinct rounds of consultation. Notification for each phase was delivered through emails, phone calls, print advertisement in local newspapers, and online postings by the applicant.

A dedicated Fraser Surrey Docks webpage for the project permit amendment was created to

inform the public about the project <http://www.fsd.bc.ca/amendment/>. In addition, a project email address was provided to accept online feedback amendment@fsd.bc.ca.

Consultation Summary Reports and Consideration Memos for both consultation phases are available on the applicant's website, and on VFPA's website.

FSD has satisfied VFPA's public consultation requirement by conducting the following two rounds of consultation.

Phase 1 Pre-application Consultation

Pre-application consultation was undertaken by FSD May 4-19, 2015.

The purpose of this phase was to provide opportunity for interested parties to comment in writing on the scope and nature of the revised environmental and health studies associated with the amendment prior to submission of a complete application to VFPA. A discussion guide and feedback form were posted online for a two-week feedback period.

During this public comment period, a total of 51 submissions were received. A full overview of the input received can be found on the applicant's website, and is summarized below:

- Online Feedback Form: 23 received
- Written Submissions: 22 received
- Local Government Submissions: 5 received
- Agency Meeting: 1 meeting

Phase 2 Application Consultation

Consultation during the permit review phase was undertaken by VFPA and FSD from July 17 – August 21, 2015.

After the application was submitted, a description of the amendment and proposed works, and all project and consultation materials resulting from the initial round of consultation were posted to VFPA's website. Material was posted with sufficient notice and prior to the targeted stakeholder meetings in July 2015, for public review and comment.

The purpose of this phase was to provide opportunity to comment on the results and draft mitigation strategies associated with minimizing any potential impacts associated with the amendment. In addition to online consultation, the applicant held facilitated, multi-stakeholder meetings (small group meetings). A discussion guide and feedback form, were posted online for a five-week consultation period.

During this public consultation period, the following submissions were received:

- 375 submissions were received from residents in Richmond, Surrey, Delta, and New Westminister.
- 787 submissions were received from residents in Metro Vancouver (excluding those mentioned above).
- 991 submissions were received from residents of B.C. and Canada (excluding those mentioned above).
- 1,389 submissions were received from residents outside of Canada.

*49 individuals did not identify a place of residence.

During this public consultation period, feedback was received through the following methods:

- Online feedback form: 40 received
- Written submission: 3,551 received
 - Email: 2,040
 - Postcards submitted to Port Metro Vancouver: 137
 - Form letter from residents of the United States: 1,374
- Small group meetings: 2 meetings (22 total participants)

Input received through the online feedback form and written submissions has been summarized and made available on the applicant’s website, and also posted to the VFPA website.

Two small group meetings were held in Surrey on July 29 and July 30, 2015. They were open to members of the public and advertised as part of the notification for the second phase of consultation. The following are the key themes from the two meetings:

Meeting	Key Themes
<p>July 29, 2015, 1:00 p.m. – 3:00 p.m. Sheraton Vancouver Guildford Hotel Surrey, B.C.</p>	<ul style="list-style-type: none"> • Participants sought clarification regarding the changes to the project as a result of the application, including whether FSD would be using ocean- going vessels (OGVs) exclusively or if barging would be retained as a secondary option. • Participants were interested in the use of Panamax-sized vessels, asking for clarification about the potential need for additional dredging of the Fraser River following the removal of the George Massey Tunnel, and whether OGVs would be topped up with coal at another location prior to departing for Asia. • Participants asked whether the facility would have shore power capability or whether FSD would plan to install shore power in the future. • Participants were concerned about impacts of construction and operations, including increased noise from queuing of rail cars, stockpiling of coal on the site, and decreases in property values. • Participants asked about the wastewater system at the facility, including whether storm water would be released into the Fraser River, if there was on-site storage for wastewater, and whether Metro Vancouver had the capacity to deal with the waste water discharge from the facility. • Participants asked if the Air Quality Assessment accounted for multiple shipping scenarios, including a scenario where FSD moved coal by barge and OGV. They were also interested in the contents of the Air Quality Management Plan and if a draft would be made available for review and comment.

<p>July 30, 2015, 6:00 p.m. – 8:00 p.m. SFU Surrey Surrey, B.C.</p>	<ul style="list-style-type: none"> • Participants stated that Port Metro Vancouver should be running the public consultation rather than FSD, to ensure a third-party, arms-length oversight for the consultation process. • A participant noted that they had witnessed an increase in noise over the past few years and were concerned with further increases as a result of the project. They noted a concern regarding a decrease in their property value as a result of increased industrial activity. • Participants sought clarification about the transport of coal from the mine site to the terminal by rail, expressing concerns about impacts of coal dust on communities such as White Rock. Participants expressed their belief that, even with spraying, and a covered direct transfer process, coal dust would be created at some point during transport. • Participants noted that while they did not agree with the movement of coal through Fraser Surrey Docks, that the proposed amendment and shipment of coal in closed OGVs is preferable to the existing plan to ship coal by uncovered barges. • Participants questioned whether Canada should be shipping coal and FSD's role in its export. A participant noted that while they understood that FSD had a business to run, they should look at whether coal should be used elsewhere in the world. • Participants asked who was responsible in case of a fuel spill in the Fraser River, and where the closest Coast Guard station was located.
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The majority of comments received by FSD and VFPA were in opposition to the application for amendment. Comments in support of the project were also received.

Based on the record of public consultation for the project, VFPA is of the view that public consultation for the proposed amendment was thorough and of the appropriate scope in relation to the proposal. All relevant comments have been considered in the review of the amendment.

5. SUMMARY OF PERMIT CONSIDERATIONS

VFPA has reviewed the concerns raised during the consultation process and throughout the course of the project and environmental review, and are satisfied that the project as proposed, in combination with the conditions that are attached to the Permit, adequately address the technical concerns raised throughout the review process.

Results of consultation that can be categorized as general concerns with PMV jurisdiction, climate change, global warming, coal as a commodity, the export of coal, were raised during the course of this amendment review as they were during the review of the existing permit, and are considered to be outside the scope of the project and environmental review process. These topics were adequately addressed during the course of the review of the existing permit, and were not addressed again as part of this review.

Below is a table summarizing the major concerns raised (by all parties with the exception of Aboriginal Groups) as a result of the review of the project, and the consideration of each, aggregated by subject:

Human Health Risk Assessment	
Input	VFPA's consideration of input
<ul style="list-style-type: none"> • Concerns about air pollution and poor air quality from airborne pollution and coal dust, and its impacts to human health, including: <ul style="list-style-type: none"> ○ Concern regarding allergies, asthma, and cancer ○ Potential impacts to the environment, plants, animals and homes 	<ul style="list-style-type: none"> • As per project permit condition 9, prior to commencement of operations, FSD shall prepare and submit, to the satisfaction of VFPA, an Operations Management Plan that addresses mentioned concerns. • The Addendum Report to the Human Health Risk Assessment (2015) includes results from the Air Quality Assessment Addendum (2015), including dust particulates, as well as emission from OGVS berthed at FSD and along the marine transportation route on the Fraser River. • Air quality will be monitored throughout the construction period and during operations via two <i>Met One E-Sampler</i> air quality measurement stations sampling total particulate matter. If total particulate matter monitoring data exceeds air quality objectives or baseline levels, then the origin or source of the emissions will be investigated and documented. The cause and potential reasons will be determined and corrective action will be taken to ensure ambient air quality is below air quality objectives or baseline levels. • The receiving pit, or hopper, (below the railcars) will be entirely enclosed, apart from the grating at the top of the pit to allow for the entry of coal from the bottom-dump railcars.
<ul style="list-style-type: none"> • The HHRA is too narrow and should address all potential adverse impacts for the entire transport route and FSD's site, including: <ul style="list-style-type: none"> ○ Marine and rail routes ○ Project-related emissions from equipment on site ○ The cumulative impacts of industry in the area, including newly approved 	<ul style="list-style-type: none"> • The scope for the assessment satisfies the requirements of VFPA's project and environmental review process. • The scope of study and review included the terminal site and the portion of the ocean-going vessel route along the Fraser River – it does not include the rail corridor from the Canada/U.S. border to the terminal site, the route of the

<p>and pending projects that will impact the South Arm of the Fraser River</p>	<p>vessel, or other industrial activities along the Fraser River.</p> <ul style="list-style-type: none"> • Although the rail corridor is outside of VFPA jurisdiction, FSD expanded the Air Quality Assessment and the Human Health Risk Assessment to include sections along the railway from White Rock to the FSD terminal.
<p>Environmental Impact Assessment (EIA)</p>	
<ul style="list-style-type: none"> • Concerns about a potential increase in operational and construction noise related to the proposed amendment, and respondents stated that noise impacts from trains and ships should be considered in the updated studies and in mitigation commitments. 	<ul style="list-style-type: none"> • As per project permit condition 78, all noise levels resulting from construction activities shall be in keeping with standards of the City of Surrey Noise Control By-Law No. 7044, and Corporation of Delta Noise Control By-Law No. 1906, and the City of New Westminister Noise Bylaw No. 6520, whichever is most restrictive, unless prior written consent from VFPA has been obtained. • Most construction activities will take place between 7:00AM and 7:00PM to minimize potential impacts to neighbouring communities. This timing is consistent with City of Surrey and Corporation of Delta noise bylaws. • FSD is required to ensure that appropriate communication is provided to residents for any construction work outside of the noise bylaws. • Pile driving work will be performed in accordance with industry best practices. Vibratory driving rather than hammer driving, will be used to reduce noise. • Project design minimizes unloading and conveyor noise. The receiving pit and the conveyor system will be enclosed. All conveyors will be operated via electric motors in order to minimize noise. • As per project permit condition 53, VFPA may require FSD prepare and submit a Noise Management Plan, to the satisfaction of VFPA, in the event that it becomes apparent that additional measures are necessary with regard to managing noise. • Ship noise from Panamax sized ocean-going vessels will be

	<p>comparable to the noise currently generated by similar sized vessels that already berth at FSD.</p> <ul style="list-style-type: none"> • FSD and its rail partner intend to minimize rail noise through several mitigation measures, including: • Limiting the speed of rail movements within FSD and the adjacent Port Authority Rail Yard to 3 miles per hour or less • Using continuously welded rail for the new rail segments • Ensuring that the turning angles of all new project rail installed at FSD are 12 degrees or less in order to minimize noise created by the steel railcar wheels, and the use of rail greasers may be considered as well
<ul style="list-style-type: none"> • Environmental impacts associated with the shipment of coal from FSD need to be re-evaluated with broader scope, including impacts on areas outside of the immediate environment. 	<ul style="list-style-type: none"> • VFPA was careful in considering which of the existing studies was required to be updated, or added to, for the purpose of this application. • The scope of the environmental review is determined by the VFPA, which is required to authorize any works on federal lands. • For FSD's proposal, the scope of study and review included the terminal site and the portion of the ocean-going vessel route along the Fraser River – it does not include the rail corridor from the Canada/U.S. border to the terminal site, the route of the vessel, or other industrial activities along the Fraser River. • The extent to which coal may be exported or not is outside VFPA's jurisdiction under the <i>Canada Marine Act</i>; therefore, the effects of any use of coal, if exported, are not directly linked or necessarily incidental to VFPA's exercise of power concerning the project permit.
<ul style="list-style-type: none"> • Concerns about the impacts of poor air quality on human health, such as allergies and asthma, from airborne pollution and coal dust, and from impacts on the environment, including climate change and pollution. 	<ul style="list-style-type: none"> • Potential health impacts from coal dust and pollution as a result of the project and proposed amendment are within the scope of the Human Health Risk Assessment, and have been assessed in the updated studies, including the Human Health Risk Assessment Addendum (2015). • Potential air quality impacts related to

	<p>the amendment have been assessed in the Air Quality Assessment Addendum.</p>
<p>Air Quality Assessment</p>	
<ul style="list-style-type: none"> • Air quality impacts associated with the release of coal dust from trains transferring and transporting coal in the region, from terminals, or from OGVs should be considered in the scope of the study. 	<ul style="list-style-type: none"> • Comparing barge to ship traffic would not provide meaningful data, as combustion emissions are more significant than ship. This has been confirmed to VFPA's satisfaction by the data produced by FSD in support of the amendment application (AQA). • The original Air Quality Assessment (June 2014) was completed with a scope that included an assessment of air quality impacts: <ul style="list-style-type: none"> ○ At 7 different points along the rail route in Metro Vancouver ○ At 4 different points along the marine route between FSD and the mouth of the Fraser River • Potential air quality impacts related to the amendment have been assessed in the Air Quality Assessment Addendum (2015). • The Air Quality Management Plan will be developed prior to operation as a condition of the original permit, and will include on-going monitoring. • Air quality impacts from ocean-going vessel emissions are assessed in the AQA Addendum (2015). • To comply with the rail partner's loading requirements, all customers will be required to contractually commit to: <ul style="list-style-type: none"> ○ Applying a veneer suppressant at mines pre-departure, which binds the surface particles together to provide a membrane that is resistant to dust lift-off, and a second time prior to arriving at FSD ○ Profiling coal loads in accordance with the rail partner's loading profile ○ Removing excess coal on wagon sills by using a car sill brush • The sides and bottom of the empty cars will be automatically sprayed with dust suppressant to remove any remaining coal after leaving the rail receiving building at a defined

	<p>wash car station. The spray device is configured in an arch shape along either side and across the bottom, with nozzles at specific intervals to ensure full coverage. The spray device is automatically triggered from a sensor in the track that recognizes movement of the railcar. All water collected from car washing will be automatically pumped to the adjacent water treatment/settling pond for proper handling, recycling and/or disposal.</p>
<ul style="list-style-type: none"> • The proposed scope of the Air Quality Assessment should: <ul style="list-style-type: none"> ○ Include information on how many cars form each train ○ Include information on where coal will be stored if not loaded immediately on to a ship ○ Link to the Environmental Impact Assessment • Consider upstream and downstream impacts 	<ul style="list-style-type: none"> • Potential air quality impacts related to the amendment have been assessed in the Air Quality Assessment Addendum (2015), which was available in Round 2 Public Consultation. • The AQA met VFPA's satisfaction. • The facility will continue to be a direct transfer from rail to ocean-going vessel and there will be no stockpiles of coal on site as part of the amendment. • FSD estimates 320 trains will arrive each year, approximately one train per day and each train will generally include 125 cars (up to a maximum of 135 cars). The proposed amendment to the existing permit would have no impact on the volume of coal permitted to be shipped through FSD, which is 4 million metric tonnes per year.
<p>Marine Risk Assessment</p>	
<ul style="list-style-type: none"> • The permit should include a rigorous review of the risk and consequences of all accident and spills of any kind along the route and potential adverse impacts, including a discussion of: <ul style="list-style-type: none"> ○ The owners, operators and crews of project vessels ○ An assessment of the risk of all types of project-related vessel accidents ○ The types and volumes of propulsion fuel that would be carried by project-related OGVs ○ The safety-communication systems and equipment that would be on board each project-related vessel and how it would be maintained 	<ul style="list-style-type: none"> • As part of the amendment application, a Marine Risk Assessment Update (DNV 2015) has been prepared with regards to the proposed change from barges to ocean-going vessels. This study reviewed the risks and potential consequences of project-related marine incidents. • Owners, operators and crew of vessels, and safety communications systems and equipment are governed under Transport Canada and International Marine Organization (IMO) standards which fall outside of FSD's scope. • As part of the amendment application, a Spill Response Plan has been

<ul style="list-style-type: none"> ○ Rescue protocols and maritime accident response infrastructure along the route to the open ocean ○ Operational discharges of oil from project-related vessels ○ Who would pay the costs for all impacts resulting from a project-related accident ○ Increases in the number of bunker-fuelled vessels transiting through the Salish Sea 	<p>prepared with regards to the proposed change from barges to ocean-going vessels, and includes response protocols for liquid spills.</p> <ul style="list-style-type: none"> • Rescue protocols and maritime accident response is the responsibility of the Coast Guard. VFPA is responsible for vessels operating within PMV's Navigational Jurisdiction (in Burrard Inlet and the Fraser River).
<ul style="list-style-type: none"> • Risks associated with the cumulative increase in shipping traffic in the region should be considered. 	<ul style="list-style-type: none"> • This is outside of the scope of VFPA's project and environmental review.
<ul style="list-style-type: none"> • The proposed scope of the Marine Risk Assessment is inadequate, because of the inability to mitigate constant cumulative industrial impacts on the marine environment, including: <ul style="list-style-type: none"> ○ Increased ballast water discharges and associated risk of introducing invasive species ○ Oil spills ○ Vessel noise (especially as it affects the southern resident killer whales) ○ Anchoring for queuing and/or bunkering • Vessel traffic related to any bunkering-related activities 	<ul style="list-style-type: none"> • The updated Spill Response Plan addresses topics related to spills. • VFPA does not permit in-water hull and propeller cleaning without stringent controls to prevent release of fouling organisms, and Transport Canada does not permit the unmitigated release of ballast water into the local environment. Further VFPA does not permit bilge water discharge within its jurisdiction. • Bunkering is regulated under the publically available Port Information Guide, which provides general oversight on the practices and procedures to be followed by bunker suppliers and receiving vessels in Port Metro Vancouver jurisdiction, lists specific requirements for Bunker Suppliers, and outlines the areas within the jurisdiction which bunkering is permitted, outlines practices and procedures to be followed during all bunkering operations. For example, Compliance with International Standards (ISGOTT). Port Authority Vessels attend bunker operations to enforce compliance with Port Information Guide practices and procedures. On the Fraser River, bunkering can only occur alongside a berth. • For FSD's proposal, the scope of study and review included the terminal site and the portion of the ocean-going vessel route along the Fraser River – it did not include the rail corridor from the Canada/U.S.

	<p>border to the terminal site, the route of the vessel, or other industrial activities along the Fraser River.</p> <ul style="list-style-type: none"> FSD was not required to consider effects on species at risk or killer whales given the scope of the project.
Environmental Management Plan (EMP)	
<ul style="list-style-type: none"> The scope of the Environmental Management Plan should be broader to include: <ul style="list-style-type: none"> Analysis beyond the proposed loader to see if there is something that would better reduce coal dust The cumulative impacts of newly approved and pending projects that will impact the South Arm of the Fraser River, as they relate to the type of Panamax vessel being proposed 	<ul style="list-style-type: none"> The receiving pit (below the railcars) will be entirely enclosed apart from the grating at the top of the pit to allow for the entry of coal from the bottom-dump railcars. Air quality will be monitored throughout the construction period and during operations via two <i>Met One E-Sampler</i> air quality measurement stations sampling total particulate matter. If total particulate matter monitoring data exceeds air quality objectives or baseline levels, then the origin or source of the emissions will be investigated and documented. The cause and potential reasons will be determined and corrective action will be taken to ensure ambient air quality is below air quality objectives or baseline levels.
<ul style="list-style-type: none"> There should be containment and catch basins on the dock face 	<ul style="list-style-type: none"> The facility has been designed to include containment and catch basins and details of these can be found in the updated Spill Response Plan and Water Management Plan Addendum. The loader proposed is fully enclosed, and its use is not anticipated to result in spillage. This notwithstanding, Permit conditions 68 and 70 address the possibility of spills at the terminal or from a barge.
Water Management Plan	
<ul style="list-style-type: none"> The scope of the Water Management Plan should be widened to take into account: <ul style="list-style-type: none"> Impacts to the environment, including air, the river system and human health 	<ul style="list-style-type: none"> These concerns are addressed in the Water Management Plan and the Environmental Impact Assessment, which was required by VFPA for the original permit. FSD has applied to Metro Vancouver for a Waste Discharge Permit for the

<ul style="list-style-type: none"> • Submissions received during Metro Vancouver's public comment period related to FSD's waste discharge permit application 	<p>discharge of treated storm and process water. As part of the review process being undertaken by Metro Vancouver, that agency will review the waste discharge from the facility, and VFPA is not involved in that review.</p>
<p>Fire Life Safety Plan</p>	
<ul style="list-style-type: none"> • The Fire Life Safety Plan is flawed because we are unable to mitigate such risks to the environment, and because the plan will not be effective in stopping fires and preserving life/safety. 	<ul style="list-style-type: none"> • FSD has worked with independent experts and their operational partners to develop detailed emergency response procedures for the Project. For emergency preparedness at the FSD site, the terminal has worked with RKMS Group and Hatch Mott MacDonald to ensure that applicable standards and best industry practice are followed. • VFPA has engaged the services of an outside Code Consultant to review the proposed operation from a fire and life safety perspective.
<ul style="list-style-type: none"> • There are outstanding questions, including: <ul style="list-style-type: none"> ◦ Whether Delta and Surrey Fire Departments will assist in fire response • Whether a more accessible route will be provided for emergency access to FSD 	<ul style="list-style-type: none"> • Should a fire be detected, the situation will be immediately addressed as per FSD's Emergency Response Plan. • The Surrey Fire Department is the first responder for a fire emergency at FSD, with Corporation of Delta Fire Department as the secondary responder. • Emergency access will be available through Elevator Road and Tannery Road off of the South Fraser Perimeter Road. Safe road access will be maintained by VFPA through Timberland Road for the terminal and surrounding areas, in the event of the future closure of the Elevator Road connection to the South Fraser Perimeter Road.
<p>Spill Response Plan</p>	
<ul style="list-style-type: none"> • There is a lack of confidence in the Spill Response Plan because the containment of the oil spill in English Bay in 2015 was inadequate. 	<ul style="list-style-type: none"> • As part of the amendment application a new Spill Response Plan has been prepared. • The Coast Guard is the designated authority to coordinate marine spill response, with West Coast

	Marine Response Corporation providing equipment and expertise to facilitate the response on behalf of members.
Additional Comments	
<ul style="list-style-type: none"> Concern with the process, including the approval process, and a lack of meaningful public consultation. 	<ul style="list-style-type: none"> FSD was required to undertake two rounds of consultation for this permit amendment including a public comment period prior to applying for an amendment to the existing permit.

Public comments received during Phase 2 Public Consultation were similar in nature to comments received in Phase 1 Pre-application Consultation. VFPA has reviewed the record of consultation and related documents and is of the view that the Project has adequately addressed the concerns raised during stakeholder and public consultation.

6. ENVIRONMENTAL REVIEW DECISION

In completing the environmental review, VFPA has taken into account relevant information available on the proposed project, has considered the information and proposed mitigations provided by the applicant and other information as listed elsewhere in this document, and concludes that with the implementation of proposed mitigation measures and permit conditions, the project is not likely to cause significant adverse environmental effects

7. RECOMMENDATION

In completing the project and environmental review, VFPA concludes that with the implementation of proposed mitigation measures and conditions described in the Permit, the Project has appropriately addressed all identified concerns.

It is the recommendation of staff that this application be approved subject to conformance with the project and environmental conditions listed in project permit No. 2012-072-1.

APPENDIX A
Project Permit 2012-072-1

APPENDIX B
Environmental Review Decision Statement



PORT METRO
vancouver

Fraser Surrey Docks
Direct Transfer Coal Facility

Environmental Review Decision Statement
PER No. 2012-072-1 (as amended)

(Fraser Surrey Docks amended this Project after initial Permitting by VFPA in 2014. This Decision Statement addresses the amended Project.)

November 20, 2015

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1. Introduction

This Environmental Review Decision Statement is a revision of the Decision Statement prepared for the initial Direct Transfer Coal Facility Project permitted by VFPA in 2014. FSD submitted an amended application and did not initiate the Project as initially permitted.

The Vancouver Fraser Port Authority (VFPA), a federal authority doing business as Port Metro Vancouver (PMV), manages federal Crown lands under the purview of the *Canada Marine Act*, which imparts stewardship responsibilities. VFPA accordingly conducts environmental reviews of works and activities undertaken on these lands to ensure that the works and activities do not result in significant adverse environmental effects. This Environmental Review Decision Statement documents the components of VFPA's environmental review of the Direct Transfer Coal Facility Project (the Project) as proposed by Fraser Surrey Docks LP (FSD or the Applicant) and amended on July 9, 2015. It is a companion document to the Project and Environmental Review Report.

This environmental review was carried out to address VFPA's responsibilities under the *Canada Marine Act*, and to meet the requirements of the *Canadian Environmental Assessment Act 2012* (CEAA 2012). The proposed Project is not a CEAA 2012 "designated project" and an environmental assessment as described in CEAA 2012 is not required. However, VFPA authorization is required for the Project to proceed and in such circumstances Section 67 of CEAA 2012 requires federal authorities to assure themselves that projects will not result in significant adverse environmental effects. This review provides that assurance.

The environmental review considered the project permit and amendment applications, along with supporting studies, assessments and consultations carried out or commissioned by FSD, as well as other information provided by FSD. In addition, this environmental review considered other information available to VFPA and other consultations carried out by VFPA. A full list of information sources germane to the review is provided in the following pages of this statement.

This Environmental Review Decision Statement is NOT a project authorization. It is a prerequisite to the issuance of a VFPA Project Permit, and the conclusions described in this Decision Statement require compliance with the conditions attached to that Permit.

2. Project Summary

2.1 Project Description

FSD is a multipurpose marine terminal located on the Fraser River in Surrey, British Columbia, handling containers, bulk agricultural, and breakbulk commodities. FSD has submitted a Permit Application to VFPA for the development of a Direct Transfer Coal Facility

to handle the export of up to four million metric tonnes (MMT) of coal per year.¹ Direct Transfer means that trans-shipment of the product is proposed to be direct from land to water, without being stockpiled at the terminal.

Thermal coal, graded as sub-bituminous, is proposed to be delivered by rail from Wyoming or Montana in the United States (Power River Basin) to the FSD terminal and loaded directly onto ocean going vessels (OGVs) at Berths 2 and 3. The OGVs proposed to be used for this cargo are Panamax class vessels with a 225m length overall (LOA), 32m beam and a maximum load capacity of 80,000 deadweight tonnes (DWT). These vessels would be loaded to a maximum of 54,000 tonnes and to a maximum draft of 11.5m to remain within the VFPA Navigational Channel Guidelines for the Fraser River. Any vessels accommodated at FSD would be in accordance with the current size limitations of the Fraser River and so no capital dredging or channel modifications are required. Coal loaded onto OGVs will be transported from the FSD terminal directly to markets.

While FSD intends to load the coal onto OGVs, it wishes to retain the option of occasionally loading coal onto barges as originally proposed. These would be 8,000 dead weight tonne (DWT) barges also at Berths 2 and 3. Once loaded, tugs are proposed to tow single barges down the Fraser River and then north to an existing facility operated by Lafarge Canada Inc. (Lafarge) on Texada Island in the Georgia Strait. At Texada Island, the commodity would then be loaded into deep-sea vessels for export to international markets. Barges would be towed from the FSD terminal by the marine carrier (Lafarge), only when wind speeds do not exceed 40 km/h. Tows could be in tandem in the Georgia Strait leg of the trip.

Rail traffic is proposed to be up to 320 coal trains annually via the Burlington Northern Santa Fe (BNSF) Railway. This translates into up to one rail delivery per day by BNSF, which would consist of a unit train between 124 and 135 cars in length. The train would be broken into parts for circulation around the loop track and through the dumper using an electric indexer. Each OGV would require four trains of coal for a load, while barges would be loaded two to a train. OGVs would remain at berth for the duration of loading.

The number of loaded OGV transits on the Fraser River is expected to be 80 if only OGVs are used, compared to 640 using barges. Tugs would be used to assist the OGVs with navigation within two kilometres of the FSD facility (arriving and departing) and during berthing.

If permitted, operations at the terminal will occur as follows: the commodity will arrive by train and the cars will be unloaded using a bottom-dump mechanism into an open ended covered shed/receiving pit with an integrated surge bin. The commodity will then be conveyed to the OGVs (or barges) on fixed electric belts and transferred by a slewing ship loader (a pivoting conveyor) with a telescoping spout for direct loading onto the OGVs (or barges). During loading, a binding agent or dust suppressant will be applied to the

¹ The Applicant has indicated an interest in increasing throughput up to eight MMT later, perhaps after four or five years. This Project Permit review considers only the four MMT maximum. VFPA has stated that any increase beyond that amount would require a new, full environmental review and Project Permit.

commodity as it is conveyed from the dumper to the berth face, and onto barges if required. The conveyor systems are proposed to be covered but not enclosed within structures. The conveyor on the loader will have a closely-fitting cover and a spill tray, with no transfer points except for the initial one at its landward end and the terminal one at the loading spout. Coal loaded onto OGVs will be loaded into holds that will be covered while the vessel is under way. Coal loaded onto barges will be treated with a dust suppressant and the loads will be profiled to minimize wind resistance. Coal will not be stockpiled at the terminal.

The proposed operating hours of the Direct Transfer Coal Facility will be during normal working hours between 8:00 a.m. to 4:30 p.m., but there may occasionally be operations outside of those times. FSD has committed to posting on their website 48 hours in advance of any working periods that will be conducted outside of normal dayshift hours. FSD currently operates 24 hours, 7 days a week.

The proposed infrastructure developments at the terminal to support the Direct Transfer Coal Facility consist of the following:

- Installation of new rail track and realignment of existing track within the FSD lease area, across an adjacent VFPA roadway, and within the Port Authority Rail Yard (PARY) to the east of the terminal;
- Construction of a new coal receiving/unloading facility including a receiving pit for unloading bottom-dump rail cars, conveyor systems and associated structures and enclosures;
- Construction of a new ship loading system at FSD Berths 2 and 3, including conveyors, a ship loading system equipped with a telescoping spout and spoon, 12 new fender piles (steel pipe piles), and a land-based barge winching system (for use when coal is being loaded onto barges – OGVs will use their own vessel warping systems and procedures);
- Construction of a new covered conveyor system between the new rail unloading and ship loading facilities;
- Installation of dust suppression systems along the unloading, loading and conveyor systems;
- Site drainage management systems to capture and treat site runoff for reuse on site or prior to offsite discharge (sanitary sewer discharge is proposed) as well as construction-related excavation dewatering;
- Construction necessary to mitigate certain potential adverse environmental effects associated with the Project, including installation of monitoring equipment, riparian restoration and planting, and development of new riparian fish and wildlife habitat to mitigate the effects of streamside construction associated with the Project;
- Removal (demolition) of Shed 4 at the FSD facility and the valve station corresponding to the building;

- Realignment of existing access to the adjacent eastern parcel from Elevator Road to Robson Road;
- Relocation of portions of Elevator Road to the south west;
- A fire suppression system;
- Lighting on all structures; and
- Installation of any necessary utility connections.

2.2 Project Scope

The scope of the Project consists of the components described above. It does not include the mining and/or processing of the coal at the mine site, the transportation of the coal by rail to the terminal, the transportation of the coal by vessel outside of VFPA's navigational jurisdiction, or the end use of the coal. The geographical scope is limited to FSD's physical site and the Fraser River from the FSD terminal to the downstream limits of VFPA's jurisdiction. The temporal scope comprises Project construction from the initiation of physical works and Project operation for an indefinite period of time. Decommissioning is not within the scope, as it would entail a full new review and permitting by VFPA.

3. Environmental Review Documentation and Information

The following documents and information were reviewed and considered in the environmental review of the proposed Project. Many of these were originally submitted in support of the original barge-loading proposal, while others were submitted in support of the current ocean going vessel loading proposal. The former are listed because much of their content remains applicable to the current proposal, and most of the latter documents are updates of the former. Where the content of the new and earlier documents and information is in conflict, the new content is applicable to the current review.

- Fraser Surrey Docks Pacific Rim Stevedoring "Application for an Amendment to Permit No. 2012-072 Direct Transfer Coal Facility", July 9, 2015, with the following appendices:
 - Appendix 1: Project Review Application Form [VFPA form completed by Jurgen Franke of FSD and dated July 9, 2015]
 - Appendix 2: Engineering Summary Table – Comparing Original vs. Vessel Loader Redesign
 - Appendix 3: CWA letter regarding ship loader Design Parameters [from Ken Savage of CWA to Tim Blair and Lilian Chau of VFPA, dated May 21, 2015, referencing Permit Condition 60]
 - Appendix 4: Statement on Telescopic Spout Operation [prepared by Arnd Kaspar of Thor Global]
 - Appendix 5: Project Drawings

- Appendix 6: Shed 4 Hazard Assessment [prepared by Darryl Stowe of Envirochem Services Inc. for Andre Ekkert of FSD and dated January, 2015]
- Appendix 7: Technical Memo: Rail & Vessel Operations Model [prepared by Jurgen Franke of FSD for Tim Blair of VFPA and dated June 5, 2015]
- Appendix 8: Project Construction Schedule
- Appendix 9: Addendum Report to the Human Health Risk Assessment [a July 9, 2015 memo report prepared by Tara Siemens Kennedy of SNC-Lavalin Inc. for Jurgen Franke of FSD]
- Appendix 10: Addendum to the Environmental Impact Assessment [a July 6, 2015 memo report prepared by Eileen Miranda and Brian Yates of SNC-Lavalin Inc. for Jurgen Franke of FSD]
- Appendix 11: Air Quality Assessment Addendum [a July 9, 2015 report prepared by Levelton Consultants Ltd. for FSD]
- Appendix 12: AQ Mitigations Summary Table – Comparing Original vs. Ship Loader Redesign
- Appendix 13: Risk Assessment Update for Coal Operation [prepared by Mia Matuszak, Danielle Holden and Cheryl Stahl of Det Norske Veritas (U.S.A.), Inc. for FSD and dated 2015-05-26]
- Appendix 14: Construction Environmental Management Plan [a June 3, 2015 letter from Tom A. Watson of Soleil Environmental Consultants Ltd. and Peter Frederiksen of Polaris Environmental Consultants Ltd. to Jurgen Franke of FSD with the subject line “Summary of changes to Environmental Management Plan, June 2013”]
- Appendix 15: Coal Transload Facility – Pit Excavation and Dewatering Management Plan [CWA Document No. 14028-100-REP-CV-001 Rev. P2, dated July 9, 2015]
- Appendix 16: Direct Transfer Coal Facility Water Management Plan Addendum [a June 03, 2015 memo report prepared by David N. Stewart of Omni Engineering Inc.]
- Appendix 17: Direct Transfer Coal Facility Spill Response Plan [prepared by FSD, dated June 5, 2015]
- Appendix 18: FSD Direct Transfer Coal Facility Fire Life Safety Plan [prepared for FSD by Hatch Mott MacDonald Ltd., Rev. D, dated 2015 07 08]
- Appendix 19: Proposed Coal Transload Facility Amendment Geotechnical Report [a July 6, 2015 letter report prepared for Jurgen Franke of FSD by Ujjal Chakraborty and Ben Weiss of exp Services Inc.]
- Appendix 20: AOA Fraser Surrey Docks, Draft AOA Deliverable Date [an April 28, 2015 letter from Alice Storey of Archer CRM Partnership to Jurgen Franke of FSD, regarding an Archaeological Overview Assessment]

- Appendix 21: Building Code and Fire Code Review [prepared by CFT Engineering Inc., revised March 31, 2015]
- Appendix 22: Mitigations Summary Table – Comparing Original vs. Ship Loader Redesign
- Appendix 23: Construction Communications Plan [prepared by FSD, dated July 2015]
- Appendix 24: Consultation Summary Report [prepared by Kirk & Co. Consulting Ltd., dated June 2015]
- Appendix 25: Consideration of Public Comment Period Input [prepared by FSD, dated July 9, 2015]
- Appendix 26: Consultation Plan [prepared by FSD, dated July 9, 2015]
- Appendix 27: Round 2 Public Consultation Notification Plan [prepared by FSD, dated July 9, 2015]
- A September 17, 2015 Technical Memorandum from Jeffrey Ramkellawan, Audrey Wagenaar, and Lee Nikl of Golder Associates to Tim Blair of VFPA with the subject line “Third Party Review of Amended Air Quality and Human Health Risk Assessments of a Direct Transfer Coal Facility, Fraser Surrey Docks”, including the following attachments:
 - Attachment 1: Detailed Results of Air Quality Assessment Review
 - Attachment 2: Detailed Results of Quality Assurance/Quality Control Checks
- A July 23, 2015 Memorandum from Curtis Wan of Levelton Consultants Ltd. to Jurgen Franke of FSD with the subject line “Contour Plots of the Delta Between the Original Barge Loader (PMV Permit #2012-072), and the Proposed Ship Loader (PMV amendment application 2012-072-01)”
- A July 30, 2015 *Baseline Air Quality Monitoring Summary July 2014 – June 2015* prepared by Levelton Consultants Ltd. for FSD
- A July 31, 2015 Draft Air Emission Management Plan (AEMP) prepared by Levelton Consultants Ltd. for FSD
- Fraser Surrey Docks Executive Summary – Proposed Permit Amendment to the Direct Transfer Coal Facility, March 18, 2015
- CWA Engineers drawing 14028 100 GA 090 Rev. P1, FSD DTB Coal Facility Shiploader and Barge Loader Site Plan, 2015-02-05
- CWA Engineers drawing 14028 100 GA 091 Rev. P1, FSD DTB Coal Facility Shiploader and Barge Loader General Sections, 2015-02-05
- CWA Engineers drawing 14028 100 GA 092 Rev. P1, FSD DTB Coal Facility Shiploader Site Plan, 2015-02-05
- CWA Engineers drawing 14028 100 GA 093 Rev. P1, FSD DTB Coal Facility Shiploader General Sections, 2015-02-05

- A September 12, 2012 general description of the Project prepared by FSD, in slide and bullet form including maps displaying the approximate barge delivery route and tandem towing methods
- A September 26, 2012 *Risk Assessment Study for Coal Barge Operation* prepared for FSD by Det Norske Veritas
- A November 25, 2012 letter from Karla Graf of Triton Environmental Consultants Ltd. to Jurgen Franke of FSD with the subject line "Supplemental information to EMP for a proposed coal direct to barge facility at Fraser Surrey Docks in Surrey BC"
- A November 28, 2012 e-mail from Brian Naito of Fisheries and Oceans Canada to Juergen Baumann of VFPA with the subject line "RE: Fraser Surrey Docks coal project impacts on Shadow Brook", together with later personal communications between these two individuals
- FSD's *Environmental Policy Statement*, January 1, 2013
- A VFPA Project Review Application prepared by Jurgen Franke, Director, Engineering and Maintenance of FSD Terminals Limited Partnership, dated June 13, 2012 and updated by attached memo with the subject line "*Direct to Barge Project – Detailed Project Scope* and dated May 13, 2013"
- A January 21, 2013 letter report by Tom Watson and Karla Graf of Triton Environmental Consultants Ltd. to Jurgen Franke of FSD with the subject line "*Overview discussion of the potential toxicity of unburned coal*"
- An April 18, 2013 letter from Karla Graf of Triton Environmental Consultants Ltd. to Jurgen Franke of FSD with the subject line "Proposed water and sediment quality monitoring programs for the operating temporary coal offloading facility at Fraser Surrey Docks, Surrey BC"
- A June 5, 2013 letter from Karla Graf of Triton Environmental Consultants Ltd. to Jurgen Franke of FSD with the subject line "Evaluation of Bekaert Access Road Option 2 at Fraser Surrey Docks (FSD)"
- An August, 2013 *Fraser Surrey Docks Direct Transfer Coal Facility Project Proposal Phase 2 - Consideration Memo* describing how FSD proposes to address project-related concerns raised by the public
- An August 27, 2013 letter from Jeff Scott of FSD to Jim Crandles of VFPA with the subject line "Analysis of Options for Covering Barges"
- A November 18, 2013 *Environmental Impact Assessment for the Direct Transfer Coal Facility*, (the EIA), prepared by SNC-Lavalin Inc. Environment and Water (SNC-Lavalin), including:

A summary of the potential project effects, mitigation measures and residual effects (Table 14.1 of the EIA)

And the following appendices and attachments:

- Appendix i: The project review application to VFPA referenced above
- Appendix ii: Information concerning coal dust binding and suppression agents
- Appendix iii: Information describing FSD's proposed anti-idling and dust control measures
- Appendix iv: FSD's proposed procedures for small and large-scale coal spills
- Appendix v: Lafarge's barge operating procedures
- Appendix vi: Environmental Management Plans (EMPs), including a preliminary EMP for construction and operations prepared by Triton Environmental Consultants Ltd. (Triton) in June, 2013 and an EMP for the Port Authority Rail Yard upgrade and maintenance project prepared by Triton in April, 2013
- Appendix vii: A community engagement summary
- Appendix viii: A draft air quality assessment and a draft air quality management plan both prepared by Levelton Consultants Ltd. (Levelton) on November 15, 2013 (superseded by the final air quality assessment specified later in this list)
- Appendix ix: A discussion of health effects associated with exposure to particulate matter, prepared by SNC Lavalin
- Appendix x: A list of wildlife known to occur in the Metro Vancouver area
- Appendix xi: A list of plants with special status that may occur in the Project vicinity
- Appendix xii: A list of wildlife with special status that may occur in the Project vicinity
- Appendix xiii: Letters:
 - A June 17, 1998 letter from Robert A. Strang of South Fraser Health Region to Verne Kucy of the Corporation of Delta (no subject line but responding to Delta's concerns regarding potential air quality related health impacts)
 - A July 16, 2013 letter from Leonard Ritter, Fellow of the Academy of Toxicological Studies to Jeff Scott of FSD with the subject line "*Expert Opinion Regarding Health Impact From Fugitive Coal Dust From Coal Trains*"
 - A July 16, 2013 letter from Tom A. Watson of Soleil Environmental Consultants Ltd. to Jeff Scott of FSD with the subject line "*Opinion Regarding the Potential Health Impacts from Fugitive Coal Dust from Train and Barge Transport*"
 - A July 16, 2013 memorandum from Chris Koscher of Levelton to Jeff Scott of FSD with the subject line "*Professional opinion on fugitive coal dust from coal handling facilities and transportation of coal by rail on ambient air quality and health*"
- Appendix xiv: The public version of William VanHook's September 28, 2012 statement to U.S. Surface Transportation Board regarding the reasonableness of the BNSF Railway Company's coal dust mitigation measures

- Attachment – Engineering drawings (drawings listed in the EIA that have been superseded or are no longer applicable are not listed here – see the April 17, 2014 redesign package):
 - FSD-DTB-181013-03 DTB Coal Facility Rail Works EB3785-SK-19B Rev D, 2013-09-13
 - FSD-DTB-181013-08 DTB Coal Facility Rail Car Storage 0 – 2 Million Tonnes EB3785-SK-20 Rev B, 2013-05-16
 - FSD-DTB-181013-09 DTB Coal Facility Rail Car Storage 2 – 4 Million Tonnes EB3785-SK-21 Rev A, 2013-05-16
 - FSD-DTB-181013-33 Boom (Fender) Log Design 002, 2013-05-22
- An April 17, 2014 letter from Jeff Scott of FSD to Jim Crandles of VFPA with the subject line *Fraser Surrey Docks Direct Transfer Coal Facility Design Changes*
- An April 17, 2014 FSD DTB Project Drawing Package (redesign package) submitted by Jurgen Franke of FSD, including the following drawings:
 - FSD-DTB-170414-01 (13024-SK-000 Rev P1, 14/03/04, Coal Transload Facility Redesign Process Flow Diagram)
 - FSD-DTB-170414-04 (13024-SK-003 Rev P1, 14/03/04, Coal Transload Facility Redesign General Arrangement Railcar Dumper)
 - FSD-DTB-170414-05 (13024-SK-004 Rev P1, 14/03/04, Coal Transload Facility Redesign Barge Warping System Details)
 - FSD-DTB-170414-06 (13024-SK-005 Rev P1, 14/03/04, Coal Transload Facility Redesign Sections and Details)
 - FSD-DTB-170414-07 (13024-SK-006 Rev P2, 14/04/04, Coal Transload Facility Redesign Drainage Plan)
 - FSD-DTB-170414-08 (13024-SK-007 Rev P2, 14/04/04, Coal Transload Facility Redesign Utilities Plan)
 - FSD-DTB-170414-09 (EB3785-SK-09 Rev I, 14/02/28, DTB Coal Facility – Redesign)
 - FSD-DTB-170414-10 (EB3785-SK-08 Rev I, 14/02/28, DTB Coal Facility – Redesign)
 - FSD-DTB-170414-11 (EB3785-SK-16 Rev I, 14/02/28, DTB Coal Facility – Redesign Main Gate Relocation)
 - FSD-DTB-170414-12 (EB3785-SK-17 Rev I, 14/02/28, DTB Coal Facility – Redesign Elevator Road Alignment)

- FSD-DTB-170414-13 (EB3785-SK-18 Rev I, 14/02/28, DTB Coal Facility – Redesign Bekaert Access Relocation)
- FSD-DTB-170414-14 (EB3785-SK-19A Rev H, 14/02/28, DTB Coal Facility – Redesign Rail Works)
- A May 20, 2014 letter from George Duggan of BNSF Railway to Tim Blair of VFPA affirming BNSF Railway's commitment to build a coal re-spray center along their rail line
- A June 1, 2014 *Direct Transfer Coal Facility Excavation and Dewatering Management Plan*, prepared and submitted by FSD
- A June 20, 2014 *Fraser Surrey Docks Direct Coal Transfer Facility: Air Quality Assessment*, prepared by Levelton for FSD
- A July 8, 2014 *Archaeological Overview Assessment of Direct to Barge Coal Project, Receiving Pit and Steel Tunnel*, prepared by Archer CRM Partnership for FSD
- A July 18, 2014 *Human Health Risk Assessment, Fraser Surrey Docks Direct Transfer Coal Facility*, prepared by SNC-Lavalin for FSD, including the following appendices:
 - Appendix I: Tables of risk estimate data
 - Appendix II: Tables of exposure modelling data
 - Appendix III: Worked example calculations
 - Appendix IV: A summary discussion of current human health in the region, focusing on PM_{2.5}
 - Appendix V: A discussion of the rationale for the selection of toxicity reference values
 - Appendix VI: Details on the statistical analyses used to calculate exposure concentrations from background soil and source coal
 - Appendix VII: Summary tables of analytical results
 - Appendix VIII: Results of sensitivity analyses
- An August 2014 *Direct Transfer Coal Facility Water Management Plan* prepared by Omni Engineering Inc.
- An August 2014 *Direct Transfer Coal Facility Construction and Communications Plan*, prepared and submitted by FSD
- An August 7, 2014 *Third Party Review Fraser Surrey Docks – Direct Transfer Coal Proposal*, prepared by Golder Associates for VFPA, including the following appendices:
 - Appendix A: Golder Associates initial Review Report on Fraser Surrey Docks Proposed Direct Transfer Coal Facility (January 9, 2014)

- Appendix B: Golder Associates comments on the SNC-Lavalin Human Health Risk Assessment Work Plan (February 7 and March 7, 2014)
- Appendix C: Golder Associates Review Comments on the Draft Problem Formulation for the Human Health Risk Assessment (May 9, 2014)
- Appendix D: Additional Clarification to the Human Health Risk and Air Quality Assessment Reports in Response to Golder Requests
- Appendix E: Summary of minor discrepancies in HHRA

4. Federal Environmental Review Requirements

VFPA is a designated Canada Port Authority under the *Canada Marine Act* and is a federal authority under the *Canadian Environmental Assessment Act 2012* (CEAA 2012). VFPA manages over 16,000 hectares of water, over 1,000 hectares of land and approximately 350 kilometers of shoreline.

As a federal authority, under Section 67 of CEAA 2012, VFPA must assure itself that projects it authorizes that are not CEAA 2012 designated projects do not result in significant adverse environmental effects, in a process herein referred to as federal environmental review. The proposed Project is not a CEAA 2012 designated project, but because the Project could affect federal land under VFPA's management and VFPA must authorize the Project before it can proceed, VFPA must conduct an environmental review of the Project.

VFPA's environmental review considered factors including:

- Environmental effects of the proposed Project, including the environmental effects of malfunctions or accidents that may occur in connection with the proposed Project;
- The significance of the environmental effects referred to above;
- Comments from authorities with relevant mandates and expertise;
- Comments from Aboriginal groups;
- Comments from the public; and
- Technically and economically feasible measures that would mitigate any significant adverse environmental effects of the proposed Project.

Environmental effects or changes that the proposed Project may cause on the environment also include consideration of the effects on health and socio-economic conditions and Aboriginal concerns.

The materials included with the application include an update of the Environmental Impact Assessment (EIA) submitted in support of the original barge loading proposal, including the effects of the Project on health. The EIA and its update evaluate the potential environmental effects of the proposed Project. VFPA reviewed and considered the EIA and its update as reflected in this environmental review.

5. Federal, Provincial and Regional Agency Consultation

VFPA provided Project information on the original barge-loading proposal, including the EIA, to appropriate representatives of Transport Canada, Fisheries and Oceans Canada, Environment Canada, Health Canada, the Ministry of Forests, Lands and Natural Resource Operations (FLNRO), Metro Vancouver, Vancouver Coastal Health Authority and Fraser Health Authority for review and comment.

Transport Canada was provided an initial draft of the EIA but did not comment.

Fisheries and Oceans Canada was consulted early in the Project application and review process, and a number of times as the design evolved. It was known that watercourses (including some that are or could be fish-bearing) could be affected by construction works and Project footprint, and appropriate mitigation measures needed to be accommodated in the Project design. It was determined that DFO did not need to authorize the works, but DFO did provide advice that was incorporated into the design of the mitigatory Shadow Brook riparian plantings. DFO did not express concern that potential coal spills could have adverse effects on fisheries resources.

Environment Canada was provided an initial draft of the EIA but did not comment.

Health Canada was provided an initial draft of the EIA for the Project but responded that because this is not a designated project under CEAA 2012 it would decline to comment.

FLNRO did reply but limited its comments to mentioning the need for a provincial *Water Act* approval. This is not a federal requirement and is not germane to the VFPA environmental review, but FSD has nevertheless indicated that this provincial requirement will be addressed in its final permitting process.

Metro Vancouver identified some concerns with an initial air quality modelling report provided by FSD and with potential human health issues associated with the transportation aspects of the Project. These were considered in completing the air quality assessment and the air quality management plan referenced in the EIA and the human health risk assessment commissioned by FSD, and in the completion of this review.

The Fraser Health Authority and the Vancouver Coastal Health Authority provided extensive comments regarding the human health effects that may be associated with the Project (notably the effects of coal dust but also including the potential for increased exposure to diesel exhaust particulate matter, coal dust binding agents, air quality monitoring, access for emergency response vehicles and other issues). The health authorities also raised a number of other concerns, such as with the nature and level of public engagement undertaken by FSD.

Information on the amended application was provided to Transport Canada, Fisheries and Oceans Canada, Health Canada, FLNRO, BC Ministry of Energy and Mines, Metro Vancouver,

Fraser Health Authority and Vancouver Coastal Health Authority. A summary of the comments received and how they were taken into consideration in the VFPA environmental review are detailed in the companion document, the Project and Environmental Review Report.

6. Public Consultation and Communication

Public consultation was carried out and the results were considered in the environmental review. This consultation and its consideration in the Project decision are detailed in the companion document, the Project and Environmental Review Report.

7. Aboriginal Consultation

Aboriginal consultation was carried out and the results were considered in the environmental review. This consultation and its consideration in the Project decision are detailed in the companion document, the Project and Environmental Review Report.

8. Scope of the Environmental Review

The scope of the environmental review included:

- Relevant background information as provided by the Applicant and as otherwise available to VFPA;
- The potential for residual adverse environmental effects, including cumulative environmental effects, having regard for mitigation measures that will be incorporated into the Project; and
- The significance of any residual adverse environmental effects.

The following biophysical components were considered in the environmental review:

- Fish and fish habitat, including species with special status;
- Vegetation, including species with special status;
- Wildlife and wildlife habitat, including species with special status;
- Surface water quality;
- Soil and groundwater quality; and
- Air quality, including fugitive dust emissions.

The following socio-economic components were included in the environmental review:

- Economic effects;
- Social effects including traffic, lighting, noise and employment;
- Heritage and archaeological resources;
- Risk to human health;

- Navigable waters and navigation; and
- Aboriginal considerations.

The following factors were considered in completing the environmental review:

- The purpose of the Project;
- Environmental effects of accidents and malfunctions;
- Effects of the environment on the Project; and
- Technically and economically feasible measures to mitigate any adverse environmental effects.

9. Spatial and Temporal Boundaries

Potential environmental effects specific to the proposed Project were reviewed based on two main Project phases:

- The construction phase (approximately six months of active construction followed by two months of commissioning, commencing shortly after the Project is authorized by VFPA); and
- The subsequent operation phase.

Decommissioning was not addressed in the environmental review as the operations phase of the proposed Project is indicated to be indefinite. Any future proposal to decommission the Project will be subject to environmental review by VFPA at the appropriate time, as required under existing VFPA policy for any significant physical work carried out on the lands it administers.

Spatial and temporal boundaries for the effects review were specific to the proposed Project component under review. Temporal boundaries typically included time prior to commencement of construction to determine reference or baseline conditions.

10. Environmental Effects

The following is a summary of the key conclusions of the environmental review for each of the biophysical and socio-economic components considered. Specific mitigation requirements identified for each component are described in the Applicant's "Environmental Impact Assessment for the Direct Transfer Coal Facility". Compliance with the conditions of approval included in the VFPA Project Permit is required for the conclusions described in this Decision Statement to be valid. Adherence to these conditions is a mandatory requirement of VFPA's authorization of the Project.

10.1 Biophysical Components

10.1.1 Fish and Fish Habitat, including species with special status

The Project area is frequented by fish, including species with special status and species of importance to commercial, recreational and aboriginal fisheries. It also contains habitat important to them. Project construction and operation are not expected to cause significant residual adverse effects on these, taking into consideration the implementation of the mitigation measures described in the Applicant's documents (including the Shadow Brook riparian plantings) and compliance with the mandatory conditions attached to the Project Permit (and in particular the 'Fish and Wildlife Habitat' conditions of the Permit). Potential effects generators considered included spills (coal, coal handling area storm water and hazardous materials associated with the Project), the effects of fugitive emissions of coal dust and their potentially associated binding agent residues, pile driving activity, the alienation of habitat through new road and rail footprints, and others. All potential adverse effects were assessed as insignificant, avoidable (if procedures described in the application documents are adhered to) or reversible with mitigation. It is expected that there will not be any permanent residual adverse effects (e.g., habitat loss to new rail footprint will be offset by new habitat to be created on Shadow Brook in the Project area).

The Project as initially permitted included impacts to a fish-bearing water course (Shadow Brook), but with the project revisions as proposed these impacts will no longer occur. Impacts to water courses that do not contain fish populations will increase (impacts to two streams instead of the one initially proposed) but with an overall net decrease in impacts to fish habitat. FSD will still undertake the full mitigation plantings on Shadow Brook as originally proposed.

10.1.2 Vegetation, including species with special status

Plant species with special status have been known to occur in the Project area and may be present despite having not been found in surveys the Applicant commissioned for the Project application. However, Project construction and operation are not expected to cause significant residual adverse effects on vegetation, taking into consideration the implementation of the mitigation measures described in the Applicant's documents and compliance with the mandatory conditions attached to the Project Permit (and in particular the 'Vegetation and Wildlife Habitat' conditions of the Permit). Potential effects generators considered (on species with special status and on other vegetation) included land clearing and alienation associated with new road and rail footprints, and vegetation loss resulting from drainage ditch infill associated with the Shed 4 demolition. All potential adverse effects were assessed as insignificant or avoidable with mitigation (e.g., avoiding disturbance to areas where pertinent species have been known to occur). Permanent residual adverse effects are not expected.

10.1.3 Wildlife and Wildlife Habitat, including species with special status

The Project area is extensively industrialized and has limited habitat for wildlife. Wildlife species with special status have not been recorded in the Project area, have limited potential to be present because of the industrialization, and were not found in surveys FSD

commissioned for the Project application. Nevertheless species with special status have been recorded in the broader regional area and could occur near or even in the Project area. However, Project construction and operation are not expected to cause significant residual adverse effects on these, taking into consideration the implementation of the mitigation measures described in the Applicant's documents and compliance with the mandatory conditions attached to the Project Permit (and in particular the 'Vegetation and Wildlife Habitat' and 'Fish and Wildlife Habitat' conditions of the Permit). Potential effects generators considered included new road and rail construction (habitat loss and fragmentation), spills (habitat degradation), watercourse realignment, noise and vibration (sensory disturbance) and rail car movements (collisions). All potential adverse effects were assessed as insignificant or avoidable with mitigation. Permanent residual adverse effects are not expected.

10.1.4 Surface Water Quality

The Project area contains the lower Fraser River as well as a number of watercourses tributary to it. Some of the latter are merely drainage channels for storm water flow, while others are fish-bearing or are tributary to fish-bearing streams and have functions important for fish such as food production. Water quality is important for all of these, considering their fish-bearing status or contributions to fish-bearing watercourses. Project construction and operation are not expected to cause significant residual adverse effects on water quality, taking into consideration the implementation of the mitigation measures described in the Applicant's documents and compliance with the mandatory conditions attached to the Project Permit (and in particular the 'Spill Prevention and Contingency', 'Sediment and Erosion Control' and 'Operational Water Quality' conditions of the Permit). Potential effects generators considered included spills (coal, coal handling area storm water and hazardous materials associated with the Project), site preparation (turbidity and sedimentation, excavation dewatering) and fugitive dust emissions associated with operation (turbidity and sedimentation as well as contamination through binding agent residues). All potential adverse effects were assessed as insignificant or avoidable with mitigation. Permanent residual adverse effects are not expected.

10.1.5 Soil and Groundwater Quality

The Project area is extensively industrialized, with extensive hard surfaces. Semi-permeable and permeable surface areas do exist, and there will be temporary exposures of soils during Project construction and demolition of Shed 4. Soils and groundwater are thus vulnerable to contamination, and while groundwater is not used directly in the Project area, surface watercourses are vulnerable to contamination through contaminated groundwater. However, Project construction and operation are not expected to cause significant residual adverse effects on soils or groundwater, taking into consideration the implementation of the mitigation measures described in the Applicant's documents and compliance with the mandatory conditions attached to the Project Permit (and in particular the 'Operational Water Quality' and 'Soil and Groundwater Quality' conditions of the Permit). Potential effects generators considered included spills of hazardous materials during construction and operation. All potential adverse effects were assessed as insignificant or avoidable with mitigation. Permanent residual adverse effects are not expected.

10.1.6 Air Quality, including fugitive dust emissions

The Project area, the terminal, and the shipping route to the mouth of the Fraser River, are located within the well-populated Metro Vancouver area. Project construction and operation are not expected to cause significant residual adverse effects on local or regional air quality within the region, taking into consideration the implementation of the mitigation measures described in the Applicant's documents and compliance with the mandatory conditions attached to the Project Permit (and in particular the 'Air Quality' conditions of the Permit). Potential effects generators considered included rail locomotives on the terminal, ocean going vessels at berth and within the Fraser River (criteria air contaminants and diesel particulate matter), tugs (criteria air contaminants and diesel particulate matter), uncovered rail cars and barges, and coal dumping and conveying at the FSD site (fugitive coal dust emissions). The air quality assessment considered other sources of fugitive emissions, specifically agricultural product handling, at the FSD terminal that is not directly associated with the handling of coal. Potential effects from the improvements identified in the air quality assessment for the agricultural handling process are being assessed through a separate project review by VFPA (PER 15-058). All potential adverse effects were assessed as insignificant or avoidable with mitigation. Permanent residual adverse effects are not expected, but air quality will nevertheless be confirmed with the development of an air emissions management plan in accordance with VFPA's PER Guidelines before the initiation of operations and ongoing monitoring and evaluation.

Greenhouse gas (GHG) generation from rail, ocean going vessel, barge and terminal operations (i.e., without considering end use of the coal being shipped) is not expected to increase significantly above current levels and is expected to decline on an intensity basis in the future with the ongoing implementation of regulatory measures and VFPA policies intended to address such emissions.

The end use of the coal is a GHG generator. The governments of British Columbia and Canada have implemented provincial and national resource extraction policies, which include coal mining and trade. The purpose of the *Canada Marine Act* includes the creation of marine infrastructure (including Canada Port Authorities) that supports the achievement of national, regional and local social and economic objectives and promotes and safeguards Canada's competitiveness and trade objectives, including the trade of coal. VFPA does not make international trade policy decisions defining what can or cannot be exported. As a Canadian Port Authority, VFPA assesses whether the goods and commodities can be moved safely with no significant impact to the environment and surrounding community.

Since VFPA does not approve or give permission for what commodities can be exported through the Port, what happens to any specific commodity, such as coal, and any change or effects on the environment once it is exported is not directly linked or necessarily incidental to VFPA's exercise of power concerning the Project Permit.

The extent to which coal may be exported or not is outside VFPA's jurisdiction under the *Canada Marine Act*; therefore, the effects of any use of coal, if exported, are not directly linked or necessarily incidental to PMV's exercise of power concerning the Project Permit.

As part of VFPA's review of its obligations under CEAA 2012 for a non-designated project, VFPA has considered whether it has the jurisdiction to consider the end use of coal as part of its assessment whether the Project is not likely to cause significant adverse environmental effects. For the reasons outlined above in relation to the scope of VFPA's powers under the *Canada Marine Act*, VFPA has determined that it does not have jurisdiction to do so.

10.2 Socio-Economic Components

10.2.1 Economic Effects

Employment and economic opportunities are considered to be positive during both Project construction and operation. The Project is likely to have a net positive residual effect on local, provincial, and federal economies.

10.2.2 Social Effects

The environmental review considered social effects including the industrial activities associated with the Project and road and rail impacts on local communities and community services, including schools, parks and recreation, and police and fire fighting services. All potential effects were assessed as insignificant or avoidable with mitigation. Permanent residual effects are not expected.

The potential for the generation of nuisance noise and lighting conditions associated with the Project were considered in this review. Potential effects generators considered included noise associated with coal dumping, conveying and loading and work site lighting. Project construction and operation are not expected to generate significant nuisance levels of noise and lighting, taking into consideration the implementation of the mitigation measures described in the Applicant's documents and compliance with the mandatory conditions attached to the Project Permit (and in particular the 'Noise' and 'Lighting' conditions of the Permit).

10.2.3 Heritage and Archaeological Resources

The environmental review included consideration of six known archaeological sites within two kilometres of the FSD terminal. All potential effects were assessed as insignificant or avoidable with mitigation. Permanent residual effects on archaeological resources are not expected. There are no reported heritage resources at risk from this Project.

10.2.4 Risk to Human Health

During the VFPA review of the FSD EIA submitted in support of the original barge-loading proposal, as well as of comments received from other reviewers (the Health Authorities, Metro Vancouver and the public), it became clear that further studies were required on the

effects of the Project on human health. Accordingly, a Human Health Risk Assessment (HHRA) was undertaken. FSD engaged a qualified consultant (SNC Lavalin) to conduct the HHRA for the original barge-loading proposal, and VFPA engaged a different qualified consultant (Golder Associates) to conduct an independent third party review of the HHRA (i.e., VFPA did not seek to influence or direct Golder's review towards any particular outcome). An HHRA assesses health risks to individuals, in contrast to a Health Impact Assessment (HIA), which assesses population-level health risks. VFPA deemed that an HHRA more specifically targeted the health concerns expressed by the public during consultation on this Project.

The scope of the HHRA consisted of the development and operation of the Project within VFPA jurisdiction, and included the delivery of coal by rail from the Canada/U.S.A. border to the FSD terminal. It drew on the results of an Air Quality Assessment (AQA) conducted by Levelton (see the information sources section of this Decision Statement). The AQA concluded that the maximum concentrations of Criteria Air Contaminants would remain below the most stringent of the municipal, provincial, national and international air quality objectives and guidelines, except that NO₂ levels could exceed objectives over the waters of the Fraser River adjacent to the FSD ship berth faces. The HHRA also considered other factors including coal contaminants (organic chemicals, metals and metalloids), marine engine exhaust (volatile organic compounds and particulate composition) and potential toxicants associated with dust control chemicals. The HHRA concluded that the Project would not result in unacceptable health risks to individuals due to exposure to Project emissions, even with consideration of the NO₂ exceedances at the berth faces.

Golder's review of the HHRA found that the risk assessment followed recognized HHRA frameworks (in particular Health Canada), provided an appropriate selection of receptors, a conservative and comprehensive selection of Contaminants of Potential Concern (COPCs), and an appropriate selection of exposure pathways. Golder agreed that the HHRA's conclusions were generally reasonable and appropriate, but noted that some of the risk estimates are near the thresholds where a potential for risk appear to be indicated. Golder indicated that the convergence with thresholds is likely the result of a series of conservative assumptions (not unusual in an HHRA), but recommended that any uncertainty be resolved through air quality monitoring. In the event that monitoring identifies conditions that are worse than expected, Golder recommended that the HHRA be updated with the new data.

The HHRA was amended to evaluate the modified Project. Golder reviewed the updated AQA conducted by Levelton and the HHRA addendum report prepared by SNC-Lavalin (see the information sources section of this Decision Statement). Golder's review of the HHRA amendment found that the update followed a reasonable approach to address the Project-related changes associated with the replacement of the barge loader with a ship loader. Golder recommended that the risk estimates be re-calculated using site-specific data. These recommendations are addressed through conditions in the Project Permit.

10.2.5 Navigable Waters and Navigation

The environmental review included consideration of the impacts of the new Project-associated Ocean Going Vessel traffic and any Project-associated tug and barge traffic on existing vessel traffic, as well as the risks associated with the Project traffic. Details of the navigational issues, potential concerns associated with these and their mitigation are provided in the companion document, the Project and Environmental Review Report. All potential adverse effects were assessed as insignificant or avoidable with mitigation, and the risks were judged to be acceptable with mitigation. Permanent residual adverse effects are not expected.

10.2.6 Aboriginal Considerations

Concerns raised by Aboriginal groups were taken into consideration in this environmental review and the Project and Environmental Review Report. Details of the concerns and how they were considered by VFPA are provided in the companion document, the Project and Environmental Review Report. Permanent residual adverse effects are not expected.

10.3 Accidents and Malfunctions

VFPA's environmental review considered the potential environmental and health effects associated with accidents or malfunctions as a result of the Project during construction and operations. The range of considered accidents and malfunctions included spills and leaks, road, rail and marine movement incidents, emergency response incidents and fugitive dust emissions (see Section 9.0 of FSD's EIA and Appendix 10 of FSD's "Application For An Amendment"). All potential effects were assessed as insignificant or avoidable with mitigation. Permanent residual effects are not expected.

10.4 Effects of the Environment on the Project

The environmental review considered potential effects of the environment on the Project during construction and operations, including the potential effects of seismic events, tidal conditions and severe weather (see Section 10.0 of FSD's EIA and Appendix 10 of FSD's "Application For An Amendment"). All potential effects were assessed as insignificant or avoidable with mitigation. Permanent residual effects are not expected.

10.5 Cumulative Environmental Effects

FSD's cumulative environmental effects assessment is described specifically in Section 12.0 of its EIA and more generally in the Levelton 2014 Air Quality Assessment and the HHRA (and their updates in Appendices 9, 10 and 11 of FSD's "Application For An Amendment").

Cumulative environmental effects are those effects that might occur when the effects of the reviewed Project act cumulatively or in combination with the effects of other past, present or future known projects, including those that will or are likely to occur in a reasonable temporal and spatial scale.

Cumulative environmental effects occur when:

- impacts on the natural and social environments take place so frequently or densely that the combined individual effects cannot be assimilated into the environment; or when
- the impacts of one activity combined with those of another in a synergistic manner create a cumulative effect that is at least equal in intensity, or often greater than the total of the individual effects.

The potential effects that were assessed to be likely to act cumulatively with the effects of other projects were limited to air quality effects. Cumulative effects were identified but considering the AQA and HHRA specifically, the air quality effects were assessed to be not significant or avoidable with mitigation.

11. Environmental Review Decision

In completing this federal environmental review, VFPA has reviewed and taken into account relevant information available on the proposed Project, has considered the information and proposed mitigations provided by FSD and other information as listed in Section 3.0 of this document, and concludes that with the implementation of proposed mitigation measures and conditions (as described in the Conditions in the Project Permit), the Project is not likely to cause significant adverse environmental effects.

Vancouver Fraser Port Authority (VFPA)
November 20, 2015

APPENDIX C

Golder Associates Technical Memorandum

THIRD PARTY REVIEW OF AMENDED AIR QUALITY AND HUMAN HEALTH RISK
ASSESSMENTS OF A DIRECT TRANSFER COAL FACILITY, FRASER SURREY DOCKS

DATE September 22, 2015

REFERENCE No. 1527638-002-TM-Rev2

TO Mr. Tim Blair
Vancouver Fraser Port Authority

FROM Jeffrey Ramkellawan, Audrey Wagenaar,
and Lee Nikl

EMAIL jramkellawan@golder.com;
awagenaar@golder.com;
lnikl@golder.com

THIRD PARTY REVIEW OF AMENDED AIR QUALITY AND HUMAN HEALTH RISK ASSESSMENTS OF A DIRECT TRANSFER COAL FACILITY, FRASER SURREY DOCKS

1.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by the Vancouver Fraser Port Authority to conduct a third party review of components of the Environmental Impact Assessment undertaken for the Fraser Surrey Docks proposed coal load-out operation and to provide advice of a technical nature as part of Vancouver Fraser Port Authority's permit review process.

Golder previously reviewed the air quality modeling and predictions made, the human health risk assessment and the potential liquid discharge issues associated with the project, and results are summarized in Golder (2014a; b). Fraser Surrey Docks was issued a Project Permit (PP#2012-072) by Vancouver Fraser Port Authority in August 21, 2014 to allow for the construction and operation of the Direct Transfer Coal Facility.

Golder understands that Fraser Surrey Docks is now seeking an amendment to their existing permit to allow for replacement of the barge loader with a ship loader to accommodate larger vessels (Panamax vessel class). As part of the permit amendment application, the previous air quality modeling has been updated to reflect changes to the project design and an amendment to the human health risk assessment has also been submitted to re-evaluate the modified project

The scope of the current work was to review the updated air quality assessment conducted by Levelton (2015) and the addendum report to the human health risk assessment undertaken by SNC-Lavalin (2015). The work completed by Levelton (2015) and SNC-Lavalin (2015) focuses only on the Project-related changes associated with the replacement of the barge loader with a ship loader.

2.0 REVIEW OF THE UPDATED AIR QUALITY ASSESSMENT

2.1 Overview

The scope of this work was to provide third party review comments on the amended air quality assessment prepared for the Direct Transfer Coal Facility for loading of ocean going vessels. Specifically, the work included a review, and provision of comments on the following documents:

- *Application for an Amendment to Permit No. 2012-072 Direct Transfer Coal Facility dated July 9, 2015;*



- *Contour Plots of the Delta Between the Original Barge Loader (PMV Permit #2012-072), and the Proposed Ship Loader (PMV amendment application 2012-072-01) dated July 23, 2015;*
- *Draft Air Emission Management Plan (AEMP) dated July 31, 2015; and*
- *Draft for Comment Baseline Air Quality Monitoring Summary July 2014 – June 2015 dated July 30, 2015.*

2.2 Methodology

The emission inventory used to prepare the air quality assessment was not provided with the amendment application report; however, Vancouver Fraser Port Authority requested that Levelton provide the inventory and model files (CALPUFF, CALSUM, PostUTIL and CALPOST) for the updated emission sources. As part of this scope of work the following documents/files were reviewed:

- *Application for an Amendment to Permit No. 2012-072 Direct Transfer Coal Facility dated July 9, 2015;*
- *Contour Plots of the Delta Between the Original Barge Loader (PMV Permit #2012-072), and the Proposed Ship Loader (PMV Amendment Application 2012-072-01) dated July 23, 2015;*
- *Draft Air Emission Management Plan (AEMP) dated July 31, 2015;*
- *Draft for Comment Baseline Air Quality Monitoring Summary July 2014 – June 2015 dated July 30, 2015;*
- CALPUFF input files associated with updated emission sources (cpuf_area4.inp, cpuf_area15.inp, cpuf_area16.inp, cpuf_cul1a.inp, etc.);
- CALSUM input files associated with updated emission sources (1-hour, 24-hour, annual files for carbon monoxide (CO), nitrogen oxides (NO_x), total particulate matter (TPM), and particulate matter (PM₁₀, PM_{2.5}) etc.); and
- Emission inventory FSD_Emissions_Calculations_Scenario_E_for_Golder_Condensed.xlsx.

2.3 Observations

The draft amended air quality report (Levelton 2015a) follows a logical approach, and provides a level of detail, explanatory text and referencing that is consistent with the original air quality assessment report (Levelton 2014). Detailed technical comments regarding the updated air quality assessment report are provided in Attachment 1 and are recommended for consideration in the final report.

While the report presents a reasonable estimate of air quality for the air quality assessment and for supporting the human health risk assessment (HHRA), there are some areas of the report where added clarity could be provided. These comments are not expected to impact the HHRA and it is recommended that they be addressed at the permitting stage, and as part of PMV's approval documentation. Golder recommends the following for improved clarity:

- clarification that the same meteorological files are used for both modelling scenarios (i.e., original approved project and revised project);

- clarification that the same ambient ratio curves were used to convert NO_x to nitrogen dioxide (NO₂) for both rounds of modelling; and
- rationale for the inclusion of new chemicals shown in Table 7-2.

The comments provided here are intended to support the VFPA permitting process only.

An updated Draft Air Emission Management Plan (AEMP) was provided for review with a draft for comment baseline summary report (Levelton 2015c; d). The Draft AEMP provides a logical approach to managing and mitigating potential project air quality effects and a summary of Golder comments regarding the plan are provided in Attachment 1. While the Draft AEMP and draft for comment baseline summary present a reasonable approach to manage Project Air Quality, there are some areas of the reports where added clarity could be provided at the permitting stage to enhance PMV's permitting documentation. These opportunities to provide additional clarity are listed below:

- inclusion of background concentrations and deposition values used in the air quality assessment in the draft for comment baseline report for comparison purposes and to assist in determining the representativeness of the data;
- specification of timescales or averaging periods associated with actionable items (e.g., if ambient monitoring values exceed ambient standards for example on a 24-hour basis, or if opacity is observed to be >20% for example on three consecutive observation periods, then a particular action or additional mitigation activities would be required within a specified period); and
- provision of the rationale for use of the VRAY NO₂ gas monitor with detection range of 0-30 ppm.

Additional comments on the inclusion of the above-mentioned baseline data in the estimates of risk are provided below. The review undertaken was limited to the final report and to the updated emission sources. The inclusion of emission sources that were unchanged between the original air quality assessment and the amended air quality assessment were not reviewed by Golder as part of the present review.

A detailed discussion of the observations that were noted in Golder's review is provided in Attachment 1.

3.0 REVIEW OF THE UPDATED HUMAN HEALTH RISK ASSESSMENT

3.1 Overview

SNC-Lavalin indicated that the overall scope of the HHRA remains unchanged and that changes reflect the revised Levelton (2015b) air quality predictions and associated exposure concentrations and risk estimates. Golder agrees with that approach. Golder's review focused on the changes identified in Table 2-1 of the addendum report, which include:

- Exposure assessment (exposure point concentrations and estimation of exposure to potential receptors of concern);
- Toxicity Assessment (one toxicity reference value was updated);

- Risk Characterization (results updated based on changes to exposure); and
- Summary and Conclusions of the HHRA.

The problem formulation remains unchanged from the 2014 report, with minor revisions to reflect the proposed project amendment. Golder agrees with the minor revisions.

To review updates to the exposure point concentrations, exposure doses, and risk estimates, Golder carried out the following representative sample calculations for a subset of chemicals:

- Confirmation that the air concentrations used in the assessment have been updated to reflect those in Levelton (2015b).
- Inclusion of baseline air quality monitoring data included in the human health risk assessment.
- Transcription of risk estimates in tables in the report was checked against risk estimates in Appendix III.
- Estimates of chemicals of potential concern (COPC) concentrations in soil and vegetation were checked by reproducing the sample calculation for a subset of COPCs using the updated deposition rates in Levelton (2015b).
- Calculation of Hazard Quotients (HQs) and Incremental Lifetime Cancer Risks (ILCRs) for a subset of COPCs using the equations provided in SNC-Lavalin's 2014 HHRA and updated soil, vegetation, and air data.
- Calculation of risk estimates for a subset of COPCs: arsenic (adult), cadmium (adult), nickel (adult), vanadium (toddler), benzo(a)pyrene (adult), indeno(1,2,3-cd-pyrene) (toddler), phenanthrene (toddler and adult), naphthalene (adult), PCB (adult), hexachlorobenzene (adult), and epichlorohydrin (toddler and adult).

Detailed results of the review are presented in Attachment 2. A summary of the results is provided below.

3.2 Updated Air Predictions in Levelton (2015b)

SNC-Lavalin (2015b) references the 2015 Levelton Air Quality Assessment as the source for the updated air quality data. Air quality data for the Criteria Air Contaminants (CACs) are reported in Appendix I of the HHRA, and concentrations match the updated values reported in Levelton (2015b). However, SNC-Lavalin did not report the updated air concentrations for other COPCs, which made it more challenging to determine whether the updated air concentrations were used in the HHRA. To check whether air concentrations for the other COPCs were correctly updated in the HHRA, hazard quotients (HQs) were calculated for a subset of parameters using the Levelton 2015 data and compared to the HQs reported by SNC-Lavalin (2015). Our calculations indicate that the concentrations of COPCs in air were correctly updated in the HHRA. We recommend that SNC-Lavalin include the updated Levelton (2015b) air concentrations in the HHRA for completeness.

One discrepancy was noted in the HQ for sulphur dioxide, however this was related to the incorrect (e.g., not updated) toxicity reference value (TRV) was utilized, and not to the air concentration. SNC-Lavalin did not apply the updated Metro Vancouver Ambient Air Quality Objective for sulphur dioxide (1-hour acute) of 200 mg/m³ in the HQ calculation although Section 3.4 of the text indicates that the updated value was utilized. The error associated with the use of the previous TRV did not change the overall risk result (i.e., the revised HQ remained below the acceptable threshold of 1).

3.3 Baseline Air Quality Monitoring Data Incorporated into the Risk Assessment

Baseline air quality monitoring has recently been undertaken for the Site (Levelton 2015c); however, this information has not been incorporated into the updated human health risk assessment as reviewed by Golder. Golder's review is based on the previous background data that was represented by regional monitoring stations. Where site-specific baseline air quality data are available, as they now are, those data provide a preferred basis for risk calculations. As our review did not benefit from having risk calculations with actual site-specific data, the primary characterization of risk has some uncertainty. We note however, that unless these baseline data differ significantly from the inferred (regional stations) data, this may not be consequential. In the absence of the updated (site-specific data) calculations, there is some uncertainty in the risk estimates. SNC-Lavalin should review the Levelton (2015c) data and recalculate risk estimates as appropriate to determine whether it would affect the conclusions of the risk assessment in the context of the project in its amended form.

3.4 Transcription of Risk Estimates in Tables from Appendix III

Several discrepancies were noted between risk estimates reported in Tables 3-1, 3-2, 3-3, 3-6, and 3-7 and corresponding Appendix III Tables (Tables III-2A, III-2B, III-4A, III-4B, and III-4C). A detailed discussion of the discrepancies noted is provided in Section 1.1 of Attachment 2. The discrepancies noted do not change the overall conclusions of the risk assessment because the magnitude of those discrepancies is low in the context of the risks predicted.

3.5 Fate and Transport Calculations Checks

Several minor discrepancies were noted for phenanthrene and hexachlorobenzene when calculating the bioconcentration factors (BCF), above ground plant concentrations, and below ground plant concentrations. Section 1.2 of Attachment 2 provides a detailed discussion of the discrepancies noted. The discrepancies should be considered in the context of Section 3.6 of this letter.

3.6 Hazard Quotient (HQ) and Incremental Lifetime Cancer Risk (ILCR) Calculations Checks

Discrepancies were noted for several parameters (e.g., arsenic, cadmium, nickel, vanadium, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, phenanthrene, naphthalene, PCB, hexachlorobenzene, and epichlorohydrin) when calculating the above ground plant hazard quotients (HQs) and incremental lifetime cancer risks (ILCRs), below ground plant HQs and ILCRs, and soil dermal HQs and ILCRs. The detailed discussion of the discrepancies noted is provided in Section 1.3 of Attachment 2. These discrepancies generally appear to be related to the minor issues identified above in the calculation of bioconcentration factors, above and below ground plant concentrations, and dermal contact exposure. However, given that pathways contribute minimally to overall exposure, and that the magnitude of the HQs and ILCRs was low, the discrepancies noted do not significantly change the risk estimates and do not affect the report conclusions.

4.0 LIMITATIONS

The scope of Golder's assessment is described in this Report, and is subject to restrictions, assumptions and limitations. Golder did not perform a complete assessment of all possible conditions or circumstances that may exist at the site referenced in the Report nor did Golder undertake any of its own studies or evaluation of risk. Conditions may therefore exist which were not detected given the limited nature of the assessment Golder was retained to undertake with respect to the site and project and additional environmental studies and actions may be required. In addition, it is recognized that the passage of time affects the information provided in the Report. Golder's opinions are based upon information that existed at the time of the writing of the Report and that was described by others in the documents reviewed. It is understood that the services provided for in the scope of work allowed Golder to form no more than an opinion of the actual conditions at the site and assessments undertaken at the time the work was carried out, and cannot be used to assess the effect of any subsequent changes in any laws, regulations, the environmental quality of the site or its surroundings. If a service is not expressly indicated, the reader should not assume it has been provided.

The results of an assessment of this nature should in no way be construed as a warranty that the remainder of the environmental impact assessment, or its underlying data, which could not be reviewed, is free from any and all contamination, errors, omissions, or inconsistencies.

The following limitations apply to the work:

- Golder has not re-run the dispersion model to verify model runs and model results are correct.
- A site visit or any sampling has not been undertaken.
- Golder has only reviewed modelling files and inputs associated with updated emission sources (i.e., Golder has not verified inputs that are expected to be constant between the original and amended air quality assessment).
- CALSUM files were only checked for updated emission sources.
- Golder has conducted checks of representative sample calculations for a subset of chemicals included in the human health risk assessment.
- Golder has not reviewed the recent site-specific air quality baseline monitoring data (Levelton 2015c) to determine how these data may affect the conclusions of the risk assessment.

5.0 CLOSURE

The amended air quality assessment and human health risk assessment follow a logical approach and used methodology that is commonly utilized in such studies. The risk assessment update follows a reasonable approach to address the project changes. However, it is preferred that when site-specific air quality baseline data are available, the risk calculations be carried out based on those data. The risk assessment reviewed was based on extrapolations from regional monitoring stations, which was appropriate when the original risk assessment was carried out. As noted above, the risk estimates should be re-calculated using the site-specific data.

Other discrepancies identified in our review were minor and Golder is of the view that these discrepancies do not affect the risk conclusions; however they should be addressed for the purposes of PMV's project documentation.

The amended air quality assessment document did not include the emissions inventory, which is a common component of the air quality assessment. However, Levelton provided the inventory of updated emission sources and our review indicates that it represents a reasonable emissions inventory for the intended purpose. Vancouver Fraser Port Authority should verify that their permit files contain both the amended assessment and the emissions inventory.

GOLDER ASSOCIATES LTD.



Jeffrey Ramkellawan, M.Sc., P.Eng.
Air Quality Specialist



Audrey Wagenaar, M.Sc., DABT, PChem
Associate, Senior Environmental Scientist

Reviewed by:



Lee Nikl, M.Sc., R.P.Bio.
Principal, Senior Environmental Scientist

JR/AKW/LN/rs/bb

Attachments: Attachment 1: Detailed Results of Air Quality Assessment Review
Attachment 2: Detailed Results of Quality Assurance/Quality Control Checks

REFERENCES

- Golder Associates Ltd. (Golder). 2014a. Third Party Review: Fraser Surrey Docks – Proposed Direct Transfer Coal Facility. January 9, 2014. Report No. 1314210036-001-R-Rev0.
- Golder. 2014b. Third Party Review: Fraser Surrey Docks – Proposed Direct Transfer Coal Facility. August 7, 2014. Report No. 1314210036-008-R-Rev0.
- Levelton Consultants Ltd. 2015a. Contour Plots of the Delta Between the Original Barge Loader (PMV Permit #2012-072), and the Proposed Ship loader (PMV Amendment Application 2012-072-01). File # EE12-1611-00.
- Levelton. 2015b. Fraser Surrey Docks Direct Transfer Coal Facility; Air Quality Assessment Addendum. File #EE12-1611-00.
- Levelton. 2015c. Fraser Surrey Docks Limited Partnership: Baseline Air Quality Monitoring Summary: July 2014 – July 2015 Draft for Comment. File #R613-1648-00.
- Levelton. 2015d. Fraser Surrey Docks Limited Partnership: DRAFT Air Emission Management Plan (AEMP). File #EE12-1611-00.
- Levelton. 2014. Fraser Surrey Docks Coal Transfer Facility: Air Quality Assessment. File #EE12-1611-00.
- SNC-Lavalin. 2015. Addendum Report to the Human Health Risk Assessment Fraser Surrey Docks Direct Transfer Coal Facility. June 19, 2015. Project 615850.

ATTACHMENT 1

Detailed Results of Air Quality Assessment Review

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ATTACHMENT 1 Detailed Results of Air Quality Assessment Review

A summary of the findings and observations of the detailed air quality assessment review are provided in Table 1.

Table 1: Summary of Findings

Tracking Number	Document and Section	Finding
1	Application for an Amendment to Permit No. 2012-072 Direct Transfer Coal Facility dated July 9, 2015. Table 3-7	Data provided in the emission inventory was not sufficiently noted to verify values within report table.
2	Application for an Amendment to Permit No. 2012-072 Direct Transfer Coal Facility dated July 9, 2015. Figure 4-1 Ship Loader CALPUFF input files.	Based on the receptors provided in the amended CALPUFF input files, Golder could not verify that the fence-line receptors matched the altered fence-line as illustrated in Figure 4-1. However, gridded receptors appeared to be consistent with the original air quality assessment report.
3	Application for an Amendment to Permit No. 2012-072 Direct Transfer Coal Facility dated July 9, 2015. Section 5	For clarity, it is recommended that a statement be made that the same meteorological files are used to model the updated and the original air quality assessments.
4	Application for an Amendment to Permit No. 2012-072 Direct Transfer Coal Facility dated July 9, 2015. Section 5	Last bullet in list. We believe the text should read "For cases where the NO ₂ /NO _x ratio is greater than 1, a 100% conversion from NO _x to NO ₂ is assumed."
5	Application for an Amendment to Permit No. 2012-072 Direct Transfer Coal Facility dated July 9, 2015. Section 5	For clarity, it is recommended that a statement be made that the same ambient ratio curves are used to model the updated and the original air quality assessments.
6	Emission Inventory (In-Transit Annual Tonnage) Application for an Amendment to Permit No. 2012-072 Direct Transfer Coal Facility dated July 9, 2015. Table 6-4	Annual tonnages for criteria air contaminants, black carbon and greenhouse gas emissions are inconsistent between the emission inventory and Table 6-4 in the assessment report. However, total annual emission rates in the inventory are lower (except for direct CO ₂) than the total annual emission rates presented in Table 6-4.



ATTACHMENT 1
Detailed Results of Air Quality Assessment Review

Tracking Number	Document and Section	Finding
7	Application for an Amendment to Permit No. 2012-072 Direct Transfer Coal Facility dated July 9, 2015. Section 6.1 Emission Inventory (In-Transit Annual Tonnage).	Inconsistency between air quality report and emission inventory. Within the report it states that Ships and Tugs will travel at reduced speed (manoeuvring mode) for 1 km near the Project; however, in the inventory, a distance of 1.5 is used.
8	Application for an Amendment to Permit No. 2012-072 Direct Transfer Coal Facility dated July 9, 2015. Section 7.2 (Table 7-2)	Please clearly identify why new substances were added to Table 7-2.
9	Application for an Amendment to Permit No. 2012-072 Direct Transfer Coal Facility dated July 9, 2015. Table 7-5	Indicate if the compared maximum predictions in each of the modelling assessments occur at the same location or if the maximum predicted locations change between the assessments for each compound and each averaging period.
10	CALPUFF input files Ship_Loader	The number of receptors in the amended CALPUFF input files (20,086 receptors) is inconsistent with the number of receptors provided in the original CALPUFF input files (9,966 receptors). No explanation was provided for the reason for this difference.
11	Emission Inventory, Ship_EFs tab.	CH ₄ emission factors in Table 3-3 are 0.006 and 0.004 g/kWh in the 2010 National Marine Emissions Inventory of Canada. Emission factors are different in the emission inventory; factors used in inventory would result in higher emissions.
12	Draft for Comment Baseline Air Quality Monitoring Summary July 2014 – June 2015 dated July 30, 2015.	It is recommended that the background concentrations and deposition values used in the air quality assessment be included in the baseline report for comparison purposes and to assist in determining the representativeness of the data.
13	Draft for Comment Baseline Air Quality Monitoring Summary July 2014 – June 2015 dated July 30, 2015.	Please provide the rationale for use of the VRAY NO ₂ gas monitor with detection range of 0-30 ppm.
14	Draft Air Emission Management Plan (AEMP) dated July 31, 2015. Table 4-2	Monitoring at Station #1 and Station #2 will capture project effects from the entire facility. Table 4-2 suggests that Station #1 and Station #2 are monitoring activity specific operations. Please clarify in Table 4-2 what Station #1 and Station #2 are monitoring.



ATTACHMENT 1
Detailed Results of Air Quality Assessment Review

Tracking Number	Document and Section	Finding
15	Draft AEMP Section 4	No timeframe is given for mitigation and response actions to be taken if opacity readings are > 20% (i.e., if opacity is observed to be >20% for example on 3 consecutive observation periods, then a particular action or additional mitigation activities would be required within a specified period).
16	Draft AEMP Section 4	Bulleted list - associated timelines should be provided for mitigation and response actions (based on specific criteria such as three consecutive observations of >20% opacity a particular action will be undertaken within 24 hours).
17	Draft AEMP Section 4.0	There is no associated timescale associated to mitigation and response actionable items if ambient monitoring values exceed ambient standards (i.e., if air quality criteria are exceeded and attributable to the Project then a particular action or additional mitigation activities would be required within a specified period).
18	Draft AEMP Section 4.0	Given the quarterly monitoring proposed, it may be possible that ambient air quality standards could be exceeded at monitoring locations for a number of months before this is brought to the attention of FSD.
19	Draft AEMP Section 5.2.4	Additional information should be provided on how the NO ₂ monitoring results will be 'extrapolated' or normalized to allow comparison against ambient criteria and modelling results.
20	Draft AEMP Section 5.2.4	Please specify potential health or air quality impacts that would trigger mitigation measures or more frequent NO ₂ monitoring.
21	Draft AEMP Table 6-1	NO _x emissions will not be consistent from the Project, rather they will peak during the day when certain specific activities are taking place such as railcar movements and barge movements. Continuous monitoring of NO ₂ would be considered appropriate in this situation. How will monthly NO ₂ grab sampling address the expected hourly variability in concentrations?
22	Draft AEMP Section 7.4	Temporal trends in monitoring data should also be included and specified in the analysis/reporting.

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ATTACHMENT 2

Detailed Results of Quality Assurance/Quality Control Checks

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1.0 DETAILED RESULTS OF REPRESENTATIVE SAMPLE CALCULATION CHECKS

1.1 Transcription of Risk Estimates in Tables from Appendix III

Human Health Risk Assessment (HHRA) Table 3-1: Risk Estimates for Acute Inhalation Exposures – Maximum North Delta Residential Receptor (Toddler and Adult)

Hazard Quotients (HQs) in Table 3-1 for the Baseline, Project and Cumulative Scenarios were compared to HQs in Tables III-1A (Baseline Scenario), III-1B (Project Scenario) and III-1E (Cumulative Scenario) in Table 1.

The Baseline HQ for SO₂ (1-hour) is shown as 6.2E-02 in Table 3-1 and as 1.4E-01 in Table III-1A. The Project HQ for SO₂ (24-hour) is shown as 8.3E-02 in Table 3-1 and in Table III-1B.

Table 1: Comparison of HQs in Table 3-1 to Tables III-1A and III-1B

Parameters ¹	Table 3-1		Table III-1A	Table III-1B
	Baseline HQ	Project HQ	Baseline HQ	Project HQ
SO ₂ (1-hr)	6.20E-02	-	1.40E-01	-
SO ₂ (24-hr)	-	8.30E-02	-	8.50E-02

Notes:

1. Only parameters for which a discrepancy was identified are shown in Table 1.

HHRA Table 3-2: Risk Estimate for Acute Inhalation Exposures of Mixture of Respiratory Irritants, Not Including Cadmium and Formaldehyde – Maximum North Delta Residential Receptor (Toddler and Adult)

Hazard Quotients in Table 3-2 for the Baseline, Project and Cumulative Scenarios were summed. The discrepancies noted above have the potential to affect the calculation of the Baseline, Project and Cumulative HQ values for respiratory irritants as SO₂ is a contributor to this group of contaminants.

HHRA Table 3-3: Non-Cancer Risk Estimate for Chronic Inhalation Exposures to Gaseous COPCs – Maximum North Delta Residential Receptor (Toddler and Adult)

Hazard Quotients in Table 3-3 for Baseline and Project Scenarios were compared to HQs in Tables III-2A (Baseline Scenario) and III-2B (Project Scenario).

The Project Scenario HQ for diesel particulate matter is shown as 2.3E-02 in Table 3-3 but is 3.6E-02 in Table III-2A. This discrepancy also has the potential to affect the diesel particulate matter HQ for the Cumulative Scenario (HQ is 1.8E-01 in Table 3-3).

Table 2: Comparison of Chronic Inhalation HQs in Table 3-3 to Tables III-2A and III-2B

Parameters	Table 3-3			Table III-2A	Table III-2B
	Baseline HQ	Project HQ	Cumulative HQ	Baseline HQ	Project HQ
Diesel Particulate Matter	-	2.3E-02	1.8E-01	-	3.60E-02



HHRA Table 3-5 and Table 3-6: Chronic Risks for Multi-Pathway Exposures, Maximum North Delta Residential Receptor (Toddler and Adult)

There is no footnote for the superscript "a" for Epichlorohydrin in the Notes at the bottom of Table 3-5.

HHRA Table 3-6: Chronic Risks for Multi-Pathway Exposures, Maximum North Delta Residential Receptor (Adult)

Hazard Quotients (HQ_{all}) in Table 3-6 for the Baseline, Project and Cumulative Scenarios were compared to HQs in Tables III-4A (Baseline Scenario), III-4B (Project Scenario) and III-4C (Cumulative Scenario), respectively.

The Project HQ_{all} for hexachlorobenzene in Table 3-6 (7.1E-10) does not match the value shown in Table III-4B (3.3E-09). The Project HQ_{all} for PCBs in Table 3-6 (1.5E-09) does not match the value in Table III-4B (5.3E-03).

Table 3: Comparison of HQs in Table 3-6 to Table III-4B

Parameters	Table 3-6	Table III-4B
	Project HQ _{all}	Project HQ _{all}
Hexachlorobenzene	7.1E-10	3.3E-09
PCBs	1.5E-09	5.3E-03

HHRA Table 3-7: Cancer Risks for Multi-Pathway Exposures, Maximum North Delta Residential Receptor (Adult)

Project Scenario ILCRs in Table 3-7 were compared to values in Table III-4B. The values for benzo(a)anthracene, benzo(a)pyrene, and phenanthrene (adult) in Table 3-7 did not match the values in Table III-4B.

Table 4: Comparison of Project ILCRs in Table 3-7 to Table III-4B

Parameters	Table 3-7	Table III-4B
	Project ILCR	
Benzo(a)anthracene	1.3E-08	1.3E-09
Benzo(a)pyrene	1.3E-09	1.3E-08
Phenanthrene (Adult)	1.6E-12	1.5E-12

1.2 Check of Fate and Transport Calculations

1.2.1 Bioconcentration Factor

The bioconcentration factor calculation based on the log K_{ow} value of 3.8E+00 and the formula for calculating the BCF: $\log BCF = 1.588 - 0.578(\log K_{ow})$ for hexachlorobenzene in Table II-5B (Project Above Ground Plant Concentrations for Maximum North Delta Residential Receptor) should be checked as the sample calculation (1.8E-02) could not confirm the results provided in Table II-5B (2.5E-01).



1.2.2 Above Ground Plant Concentrations (Pr)

The calculations for Pr for hexachlorobenzene in Table II-5B (Project Above Ground Plant Concentrations for Maximum North Delta Residential Receptor) should be checked as the sample calculation could not confirm the results provided in Table II-5B. This discrepancy is likely related to the issue identified above with the bioconcentration factor calculation. In addition minor discrepancies were noted for epichlorhydrin and phenanthrene.

1.2.3 Below Ground Plant Concentrations (Pr_{root})

In the calculations for Pr_{root} for phenanthrene in Table II-6B (Project Below Ground Plant Concentrations for Maximum North Delta Residential Receptor), there appears to be a slight discrepancy between the results of the sample calculation check (6.35E-08) relative to the the results provided in Table II-6B (6.6E-08). Similarly for hexachlorobenzene, the discrepancy identified above for the BCF affects the calculation of Pr_{root} .

1.3 Hazard Quotients (HQ) and Incremental lifetime Cancer Risks (ILCR) Calculation Checks

For the adult receptor, the calculations used to generate the hazard quotients and incremental lifetime cancer risks for arsenic, cadmium, nickel, benzo(a)pyrene, phenanthrene, naphthalene, PCBs, hexachlorobenzene and epichlorhydrin were checked. For the toddler receptor, the risk estimates for vanadium, indeno (1,2,3-cd) pyrene, phenanthrene, and epichlorhydrin were checked. The following summarizes the findings of the quality assurance checks.

1.3.1 Hazard Quotients - Above Ground Plant

The hazard quotient calculation for hexachlorobenzene (HQ=6.8E-14) in Table III-4B (Project Scenario Risk Estimates for the Maximum North Delta Residential Receptor [Adult]) could not be confirmed in a sample calculation (HQ=5.3E-14) and is likely the result of the discrepancy noted for the bioaccumulation factor above. A slight discrepancy was also noted in the check of hazard quotients related to above ground plants for phenanthrene and epichlorhydrin. However, given the magnitude of these HQs, these discrepancies do not affect the overall HQ estimates or report conclusions.

1.3.2 Hazard Quotients - Below Ground Plant

The hazard quotient calculation for hexachlorobenzene (HQ=9.3E-11) in Table III-4B should be checked as it could not be confirmed in a sample calculations (HQ=7.3E-14) and this is likely related to the BCF. However, given the magnitude of these HQs, these discrepancies do not affect the overall HQ estimates or report conclusions.



ATTACHMENT 2

Detailed Results of Quality Assurance/Quality Control Checks

1.3.3 Hazard Quotients - Soil Dermal Contact

The hazard quotients for soil dermal contact for arsenic, cadmium, nickel, vanadium, benzo(a)pyrene, indeno(1,2,3-cd) pyrene, phenanthrene (toddler and adult), naphthalene, PCBs, and hexachlorobenzene in Table III-3B (Project Scenario Risk Estimates for the Maximum North Delta Residential Receptor [Toddler]) and Table III-4B (Adult) should be checked as they cannot be confirmed. It appears that the reported numbers differ from the sample calculation checks by a factor of four but it is not clear why this is occurring. The soil dermal contact HQs are not a major contributor to the overall HQ, so this issue does not impact the overall risk estimates or conclusions.

1.3.4 Incremental Lifetime Cancer Risks - Above Ground Plants

The above ground plant ILCR calculations for phenanthrene, hexachlorobenzene, and epichlorophydrin in Table III-4B should be checked as there appear to be minor discrepancies between the sample calculations and reported values. However, given the magnitude of these ILCRs, these discrepancies do not affect the overall risk estimates or report conclusions.

1.3.5 Incremental Lifetime Cancer Risks - Below Ground Plants

The below ground plant ILCR calculations for benzo(a)pyrene and hexachlorobenzene in Table III-4B should be checked as there appear to be slight discrepancies between the sample calculations and reported values. However, given the magnitude of these ILCRs, these discrepancies do not affect the overall risk estimates or report conclusions.

1.3.6 Soil Dermal Contact ILCRs

The soil dermal contact ILCR calculations for arsenic, benzo(a)pyrene, phenanthrene, and hexachlorobenzene in Table III-4B should be confirmed as there appear to be discrepancies between the sample calculations and reported values. However, given the magnitude of these ILCRs, these discrepancies do not affect the overall risk estimates or report conclusions.

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APPENDIX D
Project Review package 2012-072