# **APPENDIX 8-A Valued Component Selection Rationale**



A list of candidate VCs was compiled based on issues identified through the scoping process described in Section 8.1.2 Effects Assessment Methods, Selection of Valued Components.

The selection of VCs followed a three-step selection process, as summarised in **Figure 8-1**. **Table 8-A1** describes the results of the three-step selection process with respect to each candidate VC.

The process had four potential outcomes:

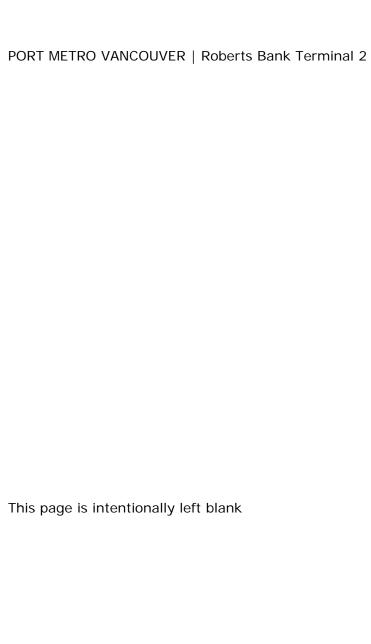
- Selection as Valued Component. The candidate VC satisfied the criteria set out in each step of the selection process and was determined to be a receptor component in an effects pathway. The candidate VC was selected as a VC for the purposes of the effects assessment.
- 2) Selection as Intermediate Component. The candidate VC satisfied the criteria set out in each step of the selection process and was determined to be an intermediate component in an effect pathway. The candidate VC was selected as an IC for the purposes of the effects assessment.
- 3) Exclusion from the Effects Assessment. The candidate VC did not satisfy the criteria set out in one or more steps of the selection process for varying reasons explained in Table 8-A2, and was not selected as an IC or a VC for the purposes of the effects assessment.
- 4) **Assigned "Other" Status.** The candidate VC satisfied the criteria set out in each step of the selection process, was determined to be relevant within the scope of the assessment but, for varying reasons explained in **Table 8-A2**, was not selected as an IC or a VC for the purposes of the effects assessment.



**Table 8-A1** Three-Step Selection Process and Outcomes

					.000 u												Can	didat	te Co	mpon	ents															
Step	Valued Component Selection Process Questions	Air Quality	Noise and Vibration	Light	Hydrology	Groundwater	Coastal Geomorphology	Surficial Geology	Marine Sediment	Marine Water Quality	Underwater Noise	Terrestrial Wildlife (non-avian species)	Terrestrial Vegetation	Freshwater Fish and Fish Habitat	Wetlands Above High Water	Marine Vegetation	Marine Invertebrates	Marine Fish	Marine Mammals	Coastal Birds	ank Ecosysten	Ongoing Productivity of CRA Fisheries	Population Demographics	Transportation	Labour Market	Economic Development	Marine Commercial Use	Local Government Finances	Housing and Temporary Accommodation	Services and Infrastructure	Outdoor Recreation	Visual Resources	Land and Water Use	Physical and Cultural Heritage	Human Health	Current Use of Land and Resources for Traditional Purposes
	A. Does the candidate VC occur in the geographic area proximal to the Project?	•	•	•	•	•	•	•	•	•	•	•	x	•	х	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	B. If so, could an interaction occur between the candidate VC and a Project component or activity?	•	•	•	x	×	•	•	•	•	•	•		x		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
1	C. If yes to both of the above questions: Is the candidate VC of interest to the public, Aboriginal groups or government? <b>OR</b>	•	•	•			•	•	•	•	•	х				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Is the candidate VC particularly sensitive or vulnerable to disturbance (i.e. species at risk)?	NA	NA	NA	NA NA	NA	NA	NA	NA	NA	NA	x	NA	NA	NA	•	•	•	•	•	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2	Could the Project result in an effect on the candidate VC?	•	•	•	INA	IVA	•	•	•	•	•			INA		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
3	Will the candidate VC be a receptor (i.e., occur at the end of an effects pathway) of potential environmental, economic, social, heritage, or health effects of the Project?	x	x	x			x	x	x	x	х	NA				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
V Co In O ta	utcome:  C = Selected as a Valued omponent  C = Selected as an attermediate Component  = Other (see Rationale in ble 8A-2 for O <sup>1</sup> to O <sup>3</sup> )  = Excluded (see Rationale in ble 8A-2 for E <sup>1</sup> to E <sup>6</sup> )	IC 1	IC 2	IC 3	E1	E2	IC 4		C 5	IC 6	IC 7	E3	E4	E5	E6	VC 1	VC 2	VC 3	VC 4	VC 5	01	VC 6	IC 8	02	VC 7	VC 8	VC 9	VC 10	V 1		VC 12	VC 13	VC 14	VC 15	VC 16	О3

<sup>• =</sup> Yes, x = No, NA = Not Applicable



Key to Intermediate Components	#
Air Quality	1
Noise and Vibration	2
Light	3
Coastal Geomorphology (Note: Includes Hydrology)	4
Surficial Geology and Marine Sediment	5
Marine Water Quality	6
Underwater Noise	7
Population	8

Key to Valued Components	#
Marine Vegetation	1
Marine Invertebrates	2
Marine Fish	3
Marine Mammals	4
Coastal Birds	5
Ongoing Productivity of Commercial, Recreational and Aboriginal Fisheries	6
Labour Market	7
Economic Development	8
Marine Commercial Use	9
Local Government Finances	10
Services and Infrastructure (Note: Includes Housing and Temporary Accommodation)	11
Outdoor Recreation	12
Visual Resources	13
Land and Water Use	14
Archaeological and Heritage Resources	15
Human Health	16

**Table 8-A2** Rationales for Candidate Component Exclusion Decisions and Other Considerations

		Decision Rationale
#	Excluded Candidate C	omponents
E <sup>1</sup>	Hydrology	There are no freshwater hydrological features (e.g., drainage ditches) within the Project area. No interactions are anticipated between an adjacent upland drainage ditch that is located near the east end of the causeway and Project components and activities. Estuarine and marine hydrological conditions are included in the <b>Coastal Geomorphology IC</b>
E <sup>2</sup>	Groundwater	No interactions are anticipated between adjacent groundwater features and Project components and activities.
E <sup>3</sup>	Terrestrial Wildlife (non-avian species)	Non-avian terrestrial wildlife species that occur within the Project area include non-native species and species that are common and widely distributed throughout the Lower Mainland, and therefore not vulnerable to disturbance. Terrestrial birds are considered in the <b>Coastal Birds VC</b> .
E <sup>4</sup>	Terrestrial Vegetation	Terrestrial vegetation on the Roberts Bank causeway to the track tie-in location (a less than 1 ha area with in the British Columbia Rail (BCR) right-of-way) is characteristic of highly disturbed sites. Terrestrial vegetation of ecological value does not occur proximal to the Project.
E <sup>5</sup>	Freshwater Fish and Fish Habitat	The Project area does not contain any freshwater fish habitat. No interactions are anticipated between an adjacent upland drainage ditch with limited fish values (i.e. habitat for three-spined stickleback) that is located near the east end of the causeway.
E <sup>6</sup>	Wetlands Above High Water	The Project area does not contain any wetlands above the high water level. Wetlands below high water level are included in the <b>Marine Vegetation VC</b> .
#	Other Candidate Com	ponents
O <sup>1</sup>	Roberts Bank Ecosystem	Roberts Bank Ecosystem is not a unique receptor or independent entity. Selected biophysical VCs allow for the assessment of potential effects on all major ecosystem components (i.e., receptors), from primary producers (Marine Vegetation VC) to secondary producers (Marine Invertebrates VC), tertiary producers (Marine Fish VC, Coastal Birds VC), and top predators (Coastal Birds VC, Marine Mammals VC).
O <sup>2</sup>	Transportation	The changes to the environment due to transportation within the Project area and PMV jurisdiction are considered in the <b>Air Quality IC</b> and the <b>Noise and Vibration IC</b> assessments. Effects of these changes on biophysical and social VCs are considered in the <b>Coastal Birds VC</b> , <b>Marine Commercial Use VC</b> , <b>Outdoor Recreation VC</b> , and <b>Human Health VC</b> assessments, as well as the assessment of Current Use of Land and Resources for Traditional Purposes.  All IC and VC assessments considered future incremental changes in road, rail, and marine vessel traffic associated with RBT2, travelling outside PMV jurisdiction, as part of the assessment of cumulative effects.
O <sup>3</sup>	Current Use of Land and Resources for Traditional Purposes	The effects of the Project on 1) access to preferred current use locations; 2) availability and quality of preferred current use resources; and 3) quality of current use experience are assessed in <b>S. 32.2 Current Use of Land and Resources for Traditional Purposes</b> .

## **APPENDIX 8-B Project Interaction Matrix**



#### APPENDIX 8-B: PROJECT INTERACTION MATRIX A. CONSTRUCTION PHASE

	Construction Phase										[Cs a	and V	Cs							(	Other			xclu er Ca				5
Project Component	Project Works/Activities	S. 9.2 Air Quality	S. 9.3 Noise and Vibration	S. 9.4 Light	S. 9.5 Coastal Geomorphology	Surficial Geology and Marine Marine Water Ouality	Underwater Noise	S. 11.0 Marine Vegetation	S. 12.0 Marine Invertebrates	S. 13.0 Marine Fish	S. 14.0 Marine Mammals	S. 15.0 Coastal bilds S. 16.0 Ongoing Productivity of CRA Fisheries	S. 18.4 Population	S. 19.0 Labour Market. S. 20.0 Economic Development		S. ZZ.U Local Government Finances S. 23.0 Services and Infrastructure	S. 24.0 Outdoor Recreation	S. 25.0 Visual Resources	0 Human H	S. 28.0 Archaeological and Heritage Resources	S. 32.0 Current Use of Land and Resources for Traditional Pur	Hydrology	Groundwater Terrestrial Wildlife (non-avian species)	-	a	Wetlands Above High Water	Roberts Bank Ecosystem	Transportation Housing and Temporary Accommodation
	Terminal Containment Dykes Land Development																											
	Vibro-densify native soil at terminal building foundation areas	•	•			•	•	•	•	•	•	• •									•					•	•	
	Transport Fraser River sand (and quarry sand if required) to ITP and store	•	•			•	•	•	•	•	•	•									•					•	•	•
	Install temporary pipeline between intermediate transfer pit (ITP) and marine terminal or causeway fill sites	•	•			•	•		•	•	• •	• •									•					•	•	
	Install piles and barge ramps	•	•			•	•		•	•	• •	• •									•						•	4
	Transport aggregate, rip-rap, and sand from existing quarries to barge ramps	•	•				•			•	• •	•		_							•					•	• •	•
	Construct permanent containment dykes around east and west terminal basins	•	•		•	• •	•	•	<b>-</b>		• •	• •		Int	tera	ctio	ons	5			•	•				_	•	
	Dredge the dredge basin, and pump dredged material to east and west terminal basins	٠	•		•	• •	•		•	•	• •	• •									•	•				•	•	
	Pump excess water in terminal basin areas to disposal at sea (DAS) site		•		-	• •	•	•	<b>-</b>		• •										•					_	•	
	Vibro-densify native soil in dredged area	•	•			• •	_	+	<del>                                     </del>		• •	_									•					_	•	
	Fill terminal basins to final grade with sand pumped from ITP	•	•			• •	_	+	<del>                                     </del>		• •	-									•					_	•	
	Preload east basin with sand from ITP, then vibro-densify dyke and compact sand	•	•		-	• •	•		1 - I		• •	•		Ag	jgre	gat	cea		_		•		+				•	4
	Preload west basin with sand from ITP and preload material from east basin, then vibro-densify dyke and compact sand	•	•			• •	•	•		•	• •	•									•						•	
	Wharf Construction																											
	Place sacrificial rock, slope buttress rock, then mattress rock in dredge basin	•	•			• •	•		•	•	•	•									•					•	•	
	Vibro-densify mattress rock in dredge basin, then pump silty material to terminal basins	•	•			• •	•		•	•	• •	• •									•					•	•	
	Level mattress rock layer; apply screed layer in caisson area	•	•			• •	•		•	•	•				ā	it					•					•	•	
Marine Terminal	Transport precast concrete caisson infrastructure to Roberts Bank via marine transport	•	•				•			•	• •	•									•					•	• •	•
	Place caissons, ballast, berm, and berm filter rock in wharf area, and install keys to lock structure together	•	•			•	•		-		• •	•									•					•	•	
	Add toe and scour protection rock in berth pocket	•	•	_	•	• •	•	-	•	•	• •	•								$\perp$	•	•				_	•	
	Install precast cover and connecting slabs on top of caissons; install cope and crane walls, and concrete crane beam	•	•			_	•	1	$\sqcup \downarrow$	-	• •	•									•					_	•	
	Fill apron area with basin and causeway preload material; vibro-densify closure dykes and compact sand		•	_	-	• •	-	-	<del>                                     </del>		• •	_			Ph	ase					•					_	•	4
	Install marine fenders, wharf hardware, mooring dolphin, and access bridge	•	•			•   •	• •		•	•	•   •	•   •									•					•	•	_
	Terminal Utilities and Infrastructure																											
	Install underground utilities in terminal buildings area, container yard (CY), intermodal yard (IY), apron area, and main wharf	•	•									•									•						•	
	Conduct ground improvements at building footprints	•	•	$\dashv$	+	+	+	+	$\vdash$	-	٠,	•								$\dashv$	•						•	
	Deliver building materials to site via road transport after RBT2 overpass completion	•	•		1	$\top$	+	1	H	-	٠,	•			Le	vel					•		•			_	_	•
	Deliver rail materials to site via rail transport after causeway rail infrastructure completion	•	•								٠	•									•		•			-	• (	•
	Construct terminal buildings; install electrical, lighting, controls, security, and communications infrastructure	•	•			1				1	•	•									•					-	•	
	Install fuelling facilities for mobile equipment/vehicles	•	•		T						•	•									•					-	•	
	Install CY, IY and terminal rail infrastructure	•	•		T						•	•									•						•	
	Deliver via ocean-going vessels and install pre-assembled terminal equipment (e.g., cranes)	•	•				•			•	•	•									•						• •	•
	Deliver granular base materials by barge to barge ramps then to trucks or barge-mounted conveyor	•	•				•			•	•	•									•						• •	•
	Pave CY, IY, and general terminal areas	•	•								•	•									•						•	
	Install truck entry and exit gate infrastructure	•	•								•	•									•					•	•	

#### APPENDIX 8-B: PROJECT INTERACTION MATRIX A. CONSTRUCTION PHASE

	Construction Phase										10	Cs a	nd V	Cs								Other		Oth		uded andid			
Project Component	Project Works/Activities	S. 9.2 Air Quality	S. 9.3 Noise and Vibration	S. 9.4 Light	S. 9.5 Coastal Geomorphology	S. 9.6 Surficial Geology and Marine Sediment	S. 9.7 Marine Water Quality	S. 9.8 Underwater Noise	S. 11.0 Marine Vegetation	S. 12.0 Marine Inverteurates S. 13.0 Marine Fish		l Bird	S. 16.0 Ongoing Productivity of CRA Fisheries	S. 18.4 Population	S. 19.0 Labour Market S. 20.0 Economic Development		S. 22.0 Local Government Finances S. 23.0 Services and Infrastructure	S. 24.0 Outdoor Recreation	S. 25.0 Visual Resources	S. 26.0 Land and Water Use S. 27.0 Human Health	S. 28.0 Archaeological and Heritage Resources	S. 32.0 Current Use of Land and Resources for Traditional Purr	Hydrology	Groundwater	I errestrial Wildlife (non-avian species) Terrestrial Vegetation	Freshwater Fish and Fish Habitat	Wetlands Above High Water	Roberts Bank Ecosystem	Housing and Temporary Accommodation
	West Widening																												
	Construct containment dyke along west portion of causeway	•	•		•	•	•	•	•	• •	•	•	•									•	•		•			•	
	Remove rip-rap/shore protection from north side of existing causeway and use for containment dyke or place in aggregate storage site at S-bend	•	•			•	•	•	•   •	•   •	•	•	•									•			•			•	
	Fill and preload contained area with sand from ITP	•	•		•	•		•	•	• •	•	•	•		In	tera	acti	ons	5			•	•					•	
	Vibro-densify dyke	•	•			•	•	•		•	•	•										•						•	
	East Widening																												
Widened Causeway	Construct containment dyke along east portion of causeway	•	•		•	•	•	•	• (	• •		•	•		Ag	ggr	ega	ted		•		•	•		•			•	
Widefied Causeway	Remove rip-rap/shore protection from north side of existing causeway and use for containment dyke or place in aggregate storage site at S-bend	•	•			•	•	•	•	•	•	•	•									•			•			•	
	Fill and preload east causeway area with west causeway preload (dry material)	•	•		•	•		•	•	• •	•	•								•		•	•					•	
	Use any remaining apron preload material for general construction	•	•														at					•							
	Infrastructure and Utilities																												
	Install rail infrastructure-including new leads, T-yard, locomotive, and bad-order yards, and tie-ins to existing rail network	•	•									•										•						•	
	Construct RBT2 overpass; install new road from RBT2 overpass to RBT2 terminal and pave	•	•									•				Ph	ase	•				•						•	
	Install VACS gates, waterline in utility corridor, overpass and rail switch lighting, and two-lane emergency gravel road	•	•									•										•						•	
	Dredge entire tug basin area	•	•		•	•	•	•	•	• •	•	•	•									•	•					•	
Expanded Tug Basin	Dispose of dredge material to DAS site or re-use as general fill	•	•			•	•	•	•	• •	•	•	•			Le	evel					•						•	
	Install piles, mooring floats, gangways and navigation piles, and construct crest protection dyke	•	•		•	•	•	•	•	• •	•	•	•									•	•					•	
Decommissioning of	Remove ITP pipelines							•		• •	1.	•	•									•						•	
Temporary	Remove DAS discharge pipe/pump infrastructure	•	•			•	•	•	•	• •	•	•	•									•						•	
Construction Infrastructure	Remove temporary piles at barge ramps, ramps, pivot ramp abutments, and navigation markers	•	•				•	•	•	•	•	•	•									•						•	

### APPENDIX 8-B: PROJECT INTERACTION MATRIX B. OPERATION PHASE

	Operation Phase									ICs	s an	nd V	Cs									Other		Ot	Exc ner (				Cs
Project Component	Project Works/Activity	S. 9.2 Air Quality	S. 9.3 Noise and Vibration		S. 9.5 Coastal Geomorphology S. 9.6 Surficial Geology and Marine Sediment	7 Marine Water Quality		S. 11.0 Marine Vegetation		S. 14.0 Marine Mammals	S. 15.0 Coastal Birds	S. 16.0 Ongoing Productivity of CRA Fisheries	S. 18.4 Population	S. 20.0 Economic Development	S. 21.0 Marine Commercial Use	S. 22.0 Local Government Finances	Services and	S. 25.0 Visual Resources	S. 26.0 Land and Water Use	Human Health	S. 28.0 Archaeological and Heritage Resources	S. 32.0 Current Use of Land and Resources for Traditional Pur	Hydrology	Groundwater	Terrestrial Wildlife	Freshwater Fish and Fish Habitat	oove High Wa	Roberts Bank Ecosystem	Transportation Housing and Temporary Accommodation
	Terminal Berths  Movement and berthing of ships								T•																				•
	Mooring of ships	•	•				•		+	•	•										-	•							
	De-ballasting of ships	Ť			-	•		+				_		т	<b>'</b> n+	<b>~</b>	_+i	on	_		_								
			•		_	•			•	1					.110	ei c	ICLI	OH	>		_	•		_		_	-	•	
	Ship-to-shore container movement	•	•								•	_									_	•			•			•	
	Resupplying of ships (potable water, consumables, etc.)	•			_	_		_	+_	1											_	•		_		_	-		
	Maintenance dredging (if required)	•	•		•	•	•	• •	•	•	•	<u>•</u>									_	•						•	
	Container Storage Yard and Rail Intermodal Yards		<u> </u>				<u> </u>			1 1											_								
Marine Terminal	Transfer of containers to and from wharf and to and from container storage yard and intermodal yards with mobile horizontal transfer equipment	•	•								•				Ag	gre	ga	tec				•						•	
	Truck and train arrival, unloading and loading, and departure; container coning and de-coning	•	•								•											•			•			•	•
	Railcar maintenance		•								•											•						•	
	Infrastructure and Utilities																				_								
	Buildings - Operations, Security and Maintenance																												
	Fuel storage and fuelling stations															i	at												
	Power and lighting for 24-hour operation			•	$\perp$				•		•											•						•	
	Stormwater collection and discharge					•		-	•		•										_	•						•	
	Sanitary sewage collection, treatment and discharge					•		•	•		•										_	•						•	
	Rail and Vehicle Movements						<u> </u>			1 1						D!-					-								
	Rail traffic	•			-		$\vdash$			+ +	•	_				Ph	aS€	3			_	•			•			•	•
	Railcar storage and switching	Ľ	•	-+	+		$\vdash$	-	-	+ +											_	•						•	
Widened Causeway	DPU locomotive storage and railcar repair		•								•										_	•						•	
	Road traffic	•	<b>-</b>		$\perp$		$\vdash \vdash$	_			•										_	•			•			•	•
	Truck staging	٠	•				lacksquare			<u> </u>	•										_	•						•	
	Utilities		1 1				1			1						Le	ve	ı			_								
	Overpass lighting and rail switch lighting	_		•	+		$\vdash$	-	<del>'                                     </del>	•		_									_	•			•			•	
I Evnanded Tua Racin	Transiting of tugs between tug basin, assisting approaching and departing ships, and berthing and unberthing	•	•			•		•	•	•	•											•						•	•
	Mooring of tugs and support craft	•	•																			•							
	Maintenance dredging (if required)	•	•		•	•	•	•	•	•	•											•						•	