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17.0 VISUAL QUALITY

The assessment of potential effects of the Project on visual quality was provided in Section 17 of the EIS. This section of the EIS Addendum provides:

- An update to the potential project and cumulative effects on the Visual Quality VC as a result of the project changes
- An updated list of mitigation measures for the Visual Quality VC
- Updated conclusions on the assessment of effects on the Visual Quality VC, taking into account project changes and the requested additional information.

Table 17-1 lists the documents applicable to the Visual Quality VC submitted by PNW LNG as part of the environmental assessment process to date and identifies if information is either *updated by EIS Addendum*, *superseded*, *not relevant*, or *not affected* by information in the EIS Addendum. The following sections of the EIS Addendum contain information that updates the documents classified as *updated by EIS Addendum* in Table 17-1. Figure 17-1 to Figure 17-3 have been updated from those provided in the EIS to reflect the project changes and any other applicable updates.

Table 17-1 Status of Previously Submitted Documents

Document Name	Status
Section 17 of the EIS (February 2014)	Updated by EIS Addendum
Responses to the Working Group (June 2014)	Not affected

17.1 PROJECT EFFECTS ASSESSMENT UPDATE

17.1.1 Baseline Conditions

The baseline conditions described in the EIS apply to the marine terminal design mitigation. The marine terminal design mitigation results in the relocation of the marine terminal berth by about 510 m from the location described in the EIS location, as well as a 1.6 km clear-span suspension bridge supported by two 128 m tall towers. The baseline visual quality conditions presented in the EIS are considered to be representative of the local and regional assessment area (RAA) including the area affected by the marine terminal design mitigation. The same viewpoints used in the EIS were also used to assess the Project with design mitigations (see Figure 17-2). For baseline conditions at each of the assessed viewpoints and definitions related to the Existing Visual Condition (EVC) analysis refer to Table 17-9 of the EIS.

17.1.2 Effects Assessment

The 16 viewpoints assessed in the EIS were reassessed in consideration of the marine terminal design mitigation. The marine terminal design mitigation will be visible from 6 of the 16 locations assessed in the EIS. Table 17-2 lists the project components that will be visible from each viewpoint.



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Table 17-2 Viewpoint Description and Distance to Marine Facility and Terminal

	Viewpoint	Description	Distance	Visibility of Project Components
1.	Cassiar Cannery	Tourism resource	Mid-ground	Project Not Visible
2.	North Pacific Cannery National Historic Site	Tourism resource	Mid-ground	Facility
3.	Residence	Private residence	Mid-ground	Facility
4.	Kitson Island	Tourism/recreation resource	Mid-ground	Facility, Marine Terminal and Suspension Bridge
5.	Kitson Island Beach	Tourism/recreation resource	Foreground	Project Not Visible
6.	Ferry and Shipping Channel	Tourism corridor	Foreground	Facility, Marine Terminal and Suspension Bridge
7.	Kinahan Islands	Recreation resource	Mid-ground	Facility, Marine Terminal and Suspension Bridge
8.	Residence	Private residence	Foreground	Project Not Visible
9.	Port Edward Lots	Potential private residential development	Foreground	Facility
10.	Bridge Siting	Intersection with Skeena Drive	Foreground	Facility
11.	Local Business	Private business	Foreground	Project Not Visible
12.	Port Edward Town Hall and School	Representative of village views	Mid-ground	Facility
13.	Picnic Area	Recreation resource	Mid-ground	Facility and Suspension Bridge
14.	Highest Point in Port Edward	Representative of village views	Mid-ground	Facility, Marine Terminal and Suspension Bridge
15.	Porpoise Harbour Marina Complex	Recreation resource	Mid-ground	Facility and Suspension Bridge
16.	Rest stop	Tourism/recreation resource	Mid-ground	Project Not Visible

The methods used to assess the effects of the marine terminal design mitigation are the same as those presented in Section 17.5.1 of the EIS. Results of the visual impact assessment indicate that the Project has potential to affect visual quality within the local assessment area (LAA). The suspension bridge will be visible from Kitson Island (Viewpoint 4), the Ferry and Shipping Channel (Viewpoint 6), the Kinahan Islands (Viewpoint 7), a Picnic Area (Viewpoint 13), the highest point in Port Edward (Viewpoint 14) and the Porpoise Harbour Marina Complex (Viewpoint 15). Photographs 17-1 to 17-6 provide simulations of what the Project will look like at each of those viewpoints.

Effects associated with the potential shipping routes remain the same as those presented Section 17.3.2.2 of the EIS.



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The Project is expected to result in varying levels of visual impact during construction, operations, and decommissioning phases of the Project. The Project will be visible to some Port Edward residents and marine users, including recreationalists, tourists and visitors travelling by ship to Port Edward and Prince Rupert. The Visual Quality VC is also related to the Ambient Light VC (Section 9 of the EIS Addendum) with respect to the overall effects from the Project on visually sensitive receptors associated with the facility and potential shipping routes. Effects of lighting impacts as a result of the project changes, as well as associated mitigation strategies may be referenced within respective Sections 9.5 and 9.5.2.2 of the EIS Addendum.

Concerns regarding potential adverse effects to visual resources with respect to the project changes were expressed during consultation with stakeholders, local governments, First Nations, and the public. Concerns raised during consultation suggested that the EIS Addendum include nighttime lighting associated with the bridge, the size and colour of the bridge and height of the suspension towers.



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Photograph 17-1 Viewpoint 4 - Kitson Island

Baseline Conditions



EIS (February 2014)



EIS Addendum (October 2014)





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Photograph 17-2 Viewpoint 6 - Ferry and Shipping Channel

Baseline Conditions



EIS (February 2014 – updated to remove image of the LNG carrier)



EIS Addendum (October 2014)





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Photograph 17-3 Viewpoint 7 – Kinahan Islands

Baseline Conditions



EIS (February 2014)



EIS Addendum (October 2014)





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Photograph 17-4 Viewpoint 13 – Picnic Area

Baseline Conditions



EIS (February 2014)



EIS Addendum (October 2014)





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Photograph 17-5 Viewpoint 14 – Highest Point in Port Edward

Baseline Conditions



EIS (February 2014)



EIS Addendum (October 2014)





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Photograph 17-6 Viewpoint 15- Porpoise Harbour Marina Complex

Baseline Conditions



EIS (February 2014)



EIS Addendum (October 2014)





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The marine terminal design mitigation does not change the characterization of residual effects (i.e., context, magnitude, extent, duration, frequency, reversibility) described in the EIS for the construction, operations, and decommissioning phases of the Project. The Project occurs within a moderately disturbed area and project effects are expected to be high in magnitude, restricted to within the LAA, reversible and continuous. After the application of mitigation measures, a residual effect on Visual Quality would be considered significant if the average post development EVC within the LAA exceeds the range of disturbance within the Partial Retention visual sensitivity class (VSC) where:

- The average baseline EVC was either Preservation, Retention or Partial Retention
- The viewpoints from which the change is viewed is of moderate to high importance
- Preservation of visual quality is a principal planning objective, in consideration of other applicable planning objectives in the assessment area.

Table 17-3 provides an update to the post development existing visual conditions for the viewpoints affected by the project changes. The height and location of the changes resulted in the Project interacting with a number of additional Visual Sensitivity Units (VSUs) that were not assessed in the EIS. Only those additional VSUs that have the potential to exceed existing visual quality objectives and recommended visual quality classes were carried forward for a detailed assessment. Project changes resulted in the addition of VSUs 4 and 5 from Viewpoint 4, VSU 3 from Viewpoint 14 and VSU 2 from Viewpoint 15. Revised characterization of residual effects for visual quality is presented in Table 17-4. Changes to the information presented in Table 17-4 (compared to Table 17-16 in the EIS) are identified with underlined text.



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Table 17-3 Post Development Existing Visual Conditions Updated with Project Changes

Viewpoint	Visible Project Components	Visual Sensitivity Unit (VSU)	Visual Sensitivity Class	Visual Absorption Capacity	Baseline Existing Visual Condition/Visual Quality Objective	Baseline Existing Visual Condition Alteration (%)	DEVPT Visual Condition/Visual Quality Objective	DEVPT Existing Visual Condition Alte ration (%)	Change from Baseline
4. Kitson Island	Facility, Marine	VSU1	3	M	PR	0%	MM	36.36%	+36.36
	Terminal and Suspension	VSU 3	3	М	Р	0%	MM	50.00%	+50.00
	Bridge	VSU 4	3	L	Р	0%	MM	62.50%	+62.50
		VSU 5	WA	L	WA	0%	MM	27.11%	+27.11
6. Ferry and Shipping Channel	Facility, Marine Terminal and Suspension Bridge	VSU3	3	М	P	0%	ММ	32.31%	+32.31
7. Kinahan Islands	Facility, Marine Terminal and Suspension Bridge	VSU 2	3	М	Р	0%		17.65%	+17.65
13. Picnic Area	Facility	VSU1	3	М	R	.7%	MM	44.70%	+45.40
14. Highest Point in Port Edward	Facility and Suspension Bridge	VSU 3	3	M	Р	0%	М	22.0%	+22.0
15. Porpoise Harbour Marina Complex	Facility and Suspension Bridge	VSU2	3	М	Р	0%	М	18.18%	+18.18

Existing Visual Condition Classes

M–Modified (7-20%)

P-Preservation (0%) **R**-Retained (0-1.5%) MM-Maximally Modified (20-30%) **EM**–Excessively Modified (>30%)

PR-Partially Retained (1.5-7%)

WA–Water



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17.2 CUMULATIVE EFFECTS ASSESSMENT UPDATE

The cumulative effects assessment provided in the EIS was reviewed with respect to the marine terminal design mitigation and changes in the project construction schedule. These changes are not expected to result in a material change to the assessment of residual cumulative effects on Visual Quality.

Changes in the construction schedule for the Project have not affected the outcomes of the cumulative effects assessment for visual quality. Conclusions on significance of cumulative effects are based on effects occurring during operations; therefore, changes in the construction schedule do not affect these conclusions.

The characterization of cumulative effects (i.e., context, magnitude, extent, duration, frequency, reversibility) or prediction of the significance of those cumulative effects has not changed compared to the EIS (i.e., remains not significant) (see Table 17-5).

17.3 RESPONSES TO THE OUTSTANDING INFORMATION REQUESTS

No federal information requests concerning Visual Quality were provided for the EIS Addendum.

17.4 MITIGATION

17.4.1 Changes to Mitigation Measures Presented in the EIS

Based on project changes and the feedback received during the environmental assessment process, the set of mitigation measures originally presented in the EIS to address potential effects to Visual Quality has been updated. The mitigation measures that have been refined, added to, or removed from mitigation measures initially included in the EIS are provided below:

The following mitigation has been added:

- Bridge lighting will be designed to take advantage of energy-saving technologies that will include, where
 applicable and available, full horizontal cutoff luminaires designed to meet surface lighting requirements
 without excessive emissions as light spill, glare, or sky glow (See Section 9 of the EIS Addendum), subject to
 marine or aviation safety requirements
- The design of the suspension bridge was selected to reduce the height of the bridge towers compared to other bridge-type options.

The following mitigation measure has been changed from:

- · The height of project components is minimized to allow maximum facility screening by the vegetation buffer
- The design of the bridge and marine terminal minimizes the visual bulk



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To:

- The height of the LNG facility components on Lelu Island is minimized to allow maximum facility screening by the vegetation buffer
- The design of the access bridge to Lelu Island minimizes the visual bulk.

17.4.2 Complete List of Current Mitigation Measures

All of the technically and economically-feasible mitigation measures currently being presented by PNW LNG to address potential effects to visual quality are listed below. This includes those originally presented in the EIS that remain relevant, as well as those that have been revised or added as a result of feedback received during the environmental assessment process or as a result of the project changes (see Section 11.4.1). By implementing this full set of mitigation measures, PNW LNG is confident that the Project will not result in significant adverse effects to visual quality.

Several measures to reduce effects have been integrated into project designs. These include:

- The height of the LNG facility components on Lelu Island is minimized to allow maximum facility screening by the vegetation buffer
- Flare stack was relocated to the south side of the project site
- The design of the access bridge to Lelu Island minimizes the visual bulk
- The design of the suspension bridge was selected to reduce the height of the bridge towers compared to other bridge-type options.

Project specific mitigation measures include:

- A 30 m vegetation buffer will be retained around Lelu Island to reduce the visual impact of the Project
- Bridge lighting will be designed to take advantage of energy-saving technologies that will include, where
 applicable and available, full horizontal cutoff luminaires designed to meet surface lighting requirements
 without excessive emissions as light spill, glare, or sky glow (See Section 9 of the EIS Addendum), subject to
 marine or aviation safety requirements.

17.5 CONCLUSION

The marine terminal design mitigation will include the construction of a large suspension bridge that will affect visual quality within the LAA. The suspension bridge will be visible from greater distances compared to the project design described in the EIS, particularly at night. Members of the working group raised potential concerns about visual quality; however, feedback from the public on the project changes (see Section 3 of the EIS Addendum) has been generally positive overall.

Project changes were assessed for potential effects, including cumulative effects, on visual quality. Based on this assessment there are no changes to the characterization of the residual adverse effects (i.e., context, magnitude, extent, duration, frequency, reversibility) or the determination of significance of those effects compared to the EIS (i.e., remains not significant) (see Table 17-4 and Table 17-5). The effects of the Project on visual quality is predicted to be not significant because preservation of visual quality is not a principal planning objective in consideration of other applicable planning objectives in the assessment area.

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Table 17-4 Characterization of Residual Effects for Visual Quality

					Residua	l Effects	Charact	eristics								
Project Phase		Mitigation Measures			Magnitude	Extent	Duration	Reversibility	Frequency	Likelihood	Significance	Confidence	Follow-up and Monitoring			
Change in Visual Qua	lity															
Construction	•	A 30 m r	mature vegetation buffer will be	М	Н	LAA	LT	R	С	Н	N	М	None			
Operations		retained around the perimeter of Lelu Island			Н	LAA	LT	R	С							
Decommissioning	•		Use of full cutoff optics and dark sky			LAA	ST	R	MI							
Residual effects for all phases		approve	d lighting where possible.	М	Н	LAA	LT	R	С							
KEY			EXTENT:	FREQUENCY:							SIGNIFICANCE:					
			PDA—effects are restricted to the	PDA	S = Singl	e event-	-effect	occurs o	S = Significant							
CONTEXT:			LAA—effects extend into the LAA		MI = Mu	•	egular e	vent (no	N = Not Significant							
N = negligible level of	dist	urbance	RAA—effects extend into the RAA		schedule)— MR = Multiple regular event – effect occurs on											
L = low level of disturb M = moderate level o	f dis	turbance	DURATION:	a regula through	r basis a	nd at reg		CONFIDENCE AND RISK: Based on scientific information and statistical analysis, professional								
H= high level of disturbance MAGNITUDE:			S = Short-term M = Medium-term		C = Cont	inuous–	-effect o	occurs c	judgment and effectiveness of mitigation, and assumptions made.							
			L = Long-term		LIKELIHO	OOD OF	RESIDU/	AL EFFE		_		confidence				
N = Negligible					OCCURR	RING:				M = M	oderate	level of confidence				
L = Low M = Moderate			REVERSIBILITY:		Based or	n profes	sional ju	dgment		H = Hig	sh level o	of confidence				
			R = Reversible		L = Low	probabil	ity of oc	currenc								
H = High			I = Irreversible		M = Med	dium pro	bability	of occu								
					H = High probability of occurrence											



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Table 17-5 Summary of Cumulative Residual Environmental Effects on Visual Quality

				Resid	ual Cum	ulative E	ffects Ch	naracteri	zation			ance	
Cumulative Environmental Effect and Project Contribution		Other Projects, Activities and Actions	Mitigation and Compensation Measures	Context	Magnitude	Extent	Duration	Reversibility	Frequency	Likelihood	Significance	Prediction Confidence	Follow-up and Monitoring Programs
Reduction in Visual Quality Measures the area from which project components will be potentially visible within the LAA Quantitatively measures the change between baseline and post development landscape alterations attributed to the Project Qualitatively describes the change between the baseline and post development visual quality objective class Measures the frequency and duration that viewpoints will be exposed to the vessels	Cumulative Effect with Project (future case) Contribute to changes to the viewscape of the area from the on-shore facilities associated with each project and from increased shipping within Prince Rupert harbor.	 Atlin Terminal Canpotex Potash Export Terminal CN Rail Line Enbridge Northern Gateway Project Fairview Container Terminal Phase I Fairview Container Terminal Phase II Kitimat LNG Terminal Project LNG Canada Project Mount McDonald Wind Power Project Northland Cruise Terminal Odin Seafood Pinnacle Pellet Inc. Prince Rupert LNG Facility Prince Rupert Industrial Park Prince Rupert Grain Limited Ridley Island Log Sort Ridley Terminals Inc. Rio Tinto Alcan Aluminum Smelter and Modernization Project WatCo Pulp Mill. 	None	M	Н	RAA	LT	R	С	Н	N	M	None
and the degree to which the vessels will occupy the central field of view from each viewpoint.	Project Contribution to Cumulative Effect (in RAA) 91% of the LAA is expected to have a view of one of more of the project components The EVC in the LAA are expected to shift from 1% EVC to a post development EVC of 51%.	Construction: Site preparation (land-based) Onshore construction Marine construction. Operations: LNG facility and supporting infrastructure on Lelu Island Marine terminal use Shipping. Decommissioning: Dismantling facility and supporting Infrastructure Infrastructure Dismantling of marine terminal Site clean-up and reclamation.	See Table 17-4 Characterization of Residual Effects for Visual Quality	M	Н	LAA	LT	R	С	Н	N	М	None



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				Residu	al Cumi	ulative E	ffects Cl	haracteri	zation			nce						
Cumulative Environmental Effect and Project Contribu	ution	Other Projects, Activities and Actions Mitigation and Compensation Measures		Context	Magnitude	Extent	Duration	Reversibility	Frequency	Likelihood	Significance	Prediction Confide	Follow-up and Monitoring Programs					
KEY																		
	MAGNITI			DURATION:							LIKELIHOOD:							
CONTEXT:	_	gible: no measurable change in EVC.	ST = Short-term: measurable for the construct	Based on professional judgment														
Low resilience—visual quality is a defining element for		a measurable change in EVC but EVC remains within	_		L = Low probability of occurrence													
residents' quality of life and tourism operations and		ed Visual Quality Objective or baseline VSC. erate: measurable change in EVC resulting in a chang	,	shorter than the life of the Project.							M = Medium probability of occurrenceH = High probability of occurrence							
recreation opportunities in the LAA are highly dependent on and sensitive to adverse changes in visual quality.	VSC.	erate. Measurable change in EVC resulting in a chang	LT = Long-term: measurable for the life of the Project. P = Permanent—measurable parameter unlikely to recover to baseline. H = High prob								l occurrence							
Moderate resilience— visual quality is a desired element		measurable change in EVC resulting in the exceedan	· ·	SIGN	SIGNIFICANCE:													
in	_	ablished Visual Quality Objective and or decrease in V		S = Significant														
residents' quality of life and visual quality is important to,		rtial Retention.	SE =Single event—The effect occurs once over	N = Not Significant														
but not essential, to the tourism operations and recreation	20.011.0		MI = Multiple irregular event—effect occurs at sporadic intervals															
opportunities in the LAA.	EXTENT:		MR = Multiple regular event—effect occurs or	CONFIDENCE:														
High resilience —visual quality is not an important element	PDA—eff	fects are restricted to the PDA	intervals	-		J		Based on scientific information and statistical analysis, professional										
in residents' quality of life or for tourism operations and						C = Continuous—effect occurs continuously through life of the Project							judgment and effectiveness of mitigation, and assumptions made.					
recreation opportunities in the LAA.		L = L	L = Low level of confidence															
	REVERSIBILITY:	M =	Moderat	e level o	of confid	ence												
	R = will recover after project closure and recla	H = 1	H = High level of confidence															
	I = Irreversible																	



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17.6 REFERENCES

British Columbia Ministry of Forests and Range (BC MOF). 1997. Visual Landscape Inventory: Procedures and Standards Manual. Forest Practices Branch for the Culture Task Force, Resource Inventory Committee. Victoria, BC.

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Port of Prince Rupert Port Authority (PRPA). 2011. Port of Prince Rupert 2020 Land Use Management Plan. Accessed from http://www.rupertport.com/documents on February 8, 2013.



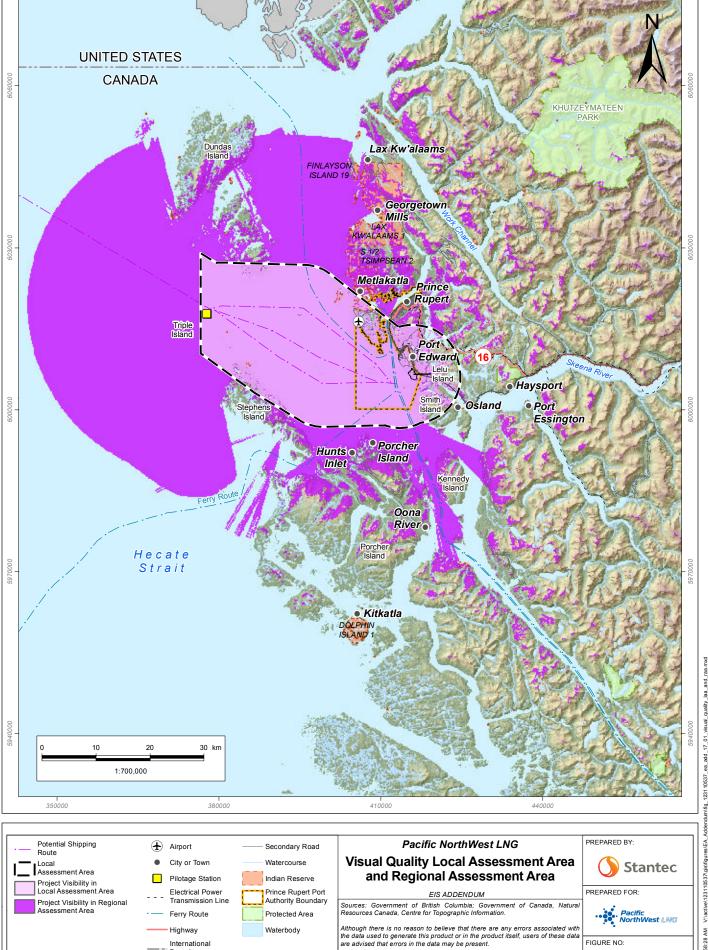
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17.7 FIGURES

Please see the following pages.





International Boundary

* The Regional Assessment Area is defined as the area beyond the Local Assessment Area from which the Project is visible

350000

FIGURE NO:

17-1

PROJECTION: UTM - ZONE 9

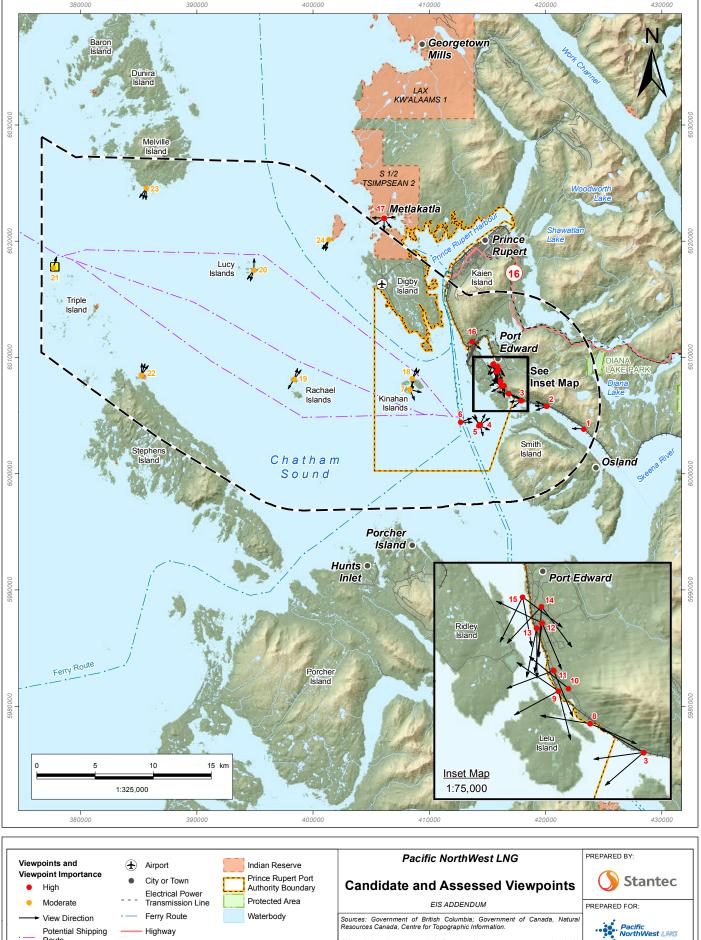
CHECKED BY: A. SMITH

NAD 83

DATUM:

FIGURE ID: 123110537-117

DRAWN BY: L. QUAN



Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

DATUM:

PROJECTION: UTM - ZONE 9

CHECKED BY: J. ELLIS

NAD 83

24-NOV-14

FIGURE ID: 123110537-402

DRAWN BY: K. POLL

Potential Shipping

Route

Local Assessment Area

Highway

----- Railway

FIGURE NO:

17-2



DATE: 24-NOV-14

FIGURE ID: 123110537-406

PROJECTION: UTM - ZONE 9

DATUM: NAD 83

DRAWN BY: K. POLL

CHECKED BY: G. MATHEWS

17-3