

Technical Report **TR-20**

Vancouver Fraser Port Authority Development Permit Application

Consultation Summary – Westridge Marine Terminal

Appendix J



TR-20

Appendix J

TMEP Response to Wilderness Tourism Association of BC Letter of Comment

**Trans Mountain Pipeline ULC
Trans Mountain Expansion Project
Responses to Letter of Comment
submitted to the NEB on April 15, 2015 from
Wilderness Tourism Association of BC (WTABC)**

Reference:

On April 15, 2015, the Wilderness Tourism Association of BC (WTABC) submitted its Letter of Comment (Filing ID [A4K5V3](#)) to the National Energy Board (NEB) regarding the Trans Mountain Expansion Project (TMEP), Hearing Order OH-001-2014.

Trans Mountain wishes to clarify comments made about its Project, by the WTABC in its Letter of Comment.

Response:

Table A-1 provides Trans Mountain's response to various WTABC's comments. The reference numbering in Table A-1 matches the numbering in the WTABC Letter of Comment.

ABBREVIATIONS AND ACRONYMS

This table lists the abbreviations and acronyms used in this response.

| Term | Meaning |
|-------------|---|
| AIS | Automated Information System |
| CAC | criteria air contaminants |
| CH4 | methane |
| CLWB | Cold Lake Winter Blend |
| CO | carbon monoxide |
| CPAWS | Canadian Parks and Wilderness Society |
| DFO | Fisheries and Oceans Canada |
| DNV | Det Norske Veritas |
| EBA | EBA, A Tetra Tech Company |
| EPP | Environmental Protection Plans |
| GAR | geographic area of response |
| ILI | In Line Inspection |
| IR | Information Request |
| KMC | Kinder Morgan Canada |
| MRA | Movement Restricted Area |
| NEB | National Energy Board |
| NO2 | nitrogen dioxide |
| NPS | |
| PSF | Pacific Salmon Foundation |
| PQERA | Preliminary Quantitative Ecological Risk Assessment |
| RSA | Regional Study Area |
| SO2 | sulphur dioxide |
| TMEP | Trans Mountain Expansion Project |
| TMP | Trans Mountain Pipeline |
| TSS | traffic separation scheme |
| VOC | Volatile organic compounds |
| WCMRC | Western Canada Marine Response Corporation |
| WMT | Westridge Marine Terminal |
| WTABC | Wilderness Tourism Association of BC |

TABLE A-1
TMEP Response to Wilderness Tourism Association of BC (WTABC) Comments

| WTABC Reference Number | WTABC Letter of Comment Content | TMEP Response |
|------------------------|--|--|
| 1.5. | <p>In general, the WTABC is not supportive of the project as it is presently conceived. We have however outlined a number of interests and concerns in this Letter of Comment, and provide recommendations that could potentially address and mitigate some of our sector's more pressing concerns related to the proposed pipeline expansion, and particularly the increase in marine - based oil tanker traffic.</p> | <ul style="list-style-type: none"> • Trans Mountain appreciates this opportunity to understand WTABC's position regarding our expansion project. • Trans Mountain's interactions with WTABC were initiated early in its engagement process which our records show involved prior leadership of the WTABC. Trans Mountain would like the opportunity to engage with the current leadership of WTABC to discuss the interests and concerns raised in its Letter of Comment, and to better understand the recommendations and mitigation measures suggested by WTABC. |
| 4.1. | <p>This \$5.4 billion proposed pipeline expansion project would result in the twinning of Kinder Morgan's existing Trans Mountain Pipeline (TMP), with an origin in Edmonton, Alberta and a terminus at the Westridge Marine Terminal in Burnaby, British Columbia.</p> | <ul style="list-style-type: none"> • Trans Mountain would like to clarify that the terminus of our proposed pipeline expansion is at our Burnaby Terminal rather than the Westridge Marine Terminal as noted by WTABC in its Letter of Comment. Beyond that terminus, two parallel delivery lines are proposed to be installed from the Burnaby Terminal to the Westridge Marine Terminal. • Section 2.0 of Volume 2 of the Application - Project Overview (Filing ID A350Q8) describes the expansion to include 994 km of new, buried pipeline segments that twin (or "loop") the existing pipeline in Alberta and BC, consisting of: <ul style="list-style-type: none"> ○ three new 914 mm (NPS 36) OD buried pipeline segments totaling approximately 987 km: <ul style="list-style-type: none"> ▪ Edmonton to Hinton – 339.4 km; ▪ Hargreaves to Darfield – 279.4 km; ▪ Black Pines to Burnaby – 367.9 km; and • Two parallel 3.6 km long 762 mm (NPS 30) OD buried delivery lines from the Burnaby Terminal to the Westridge Marine Terminal. • An updated map of the proposed expansion is provided below. |

TABLE A-1

TMEP Response to Wilderness Tourism Association of BC (WTABC) Comments

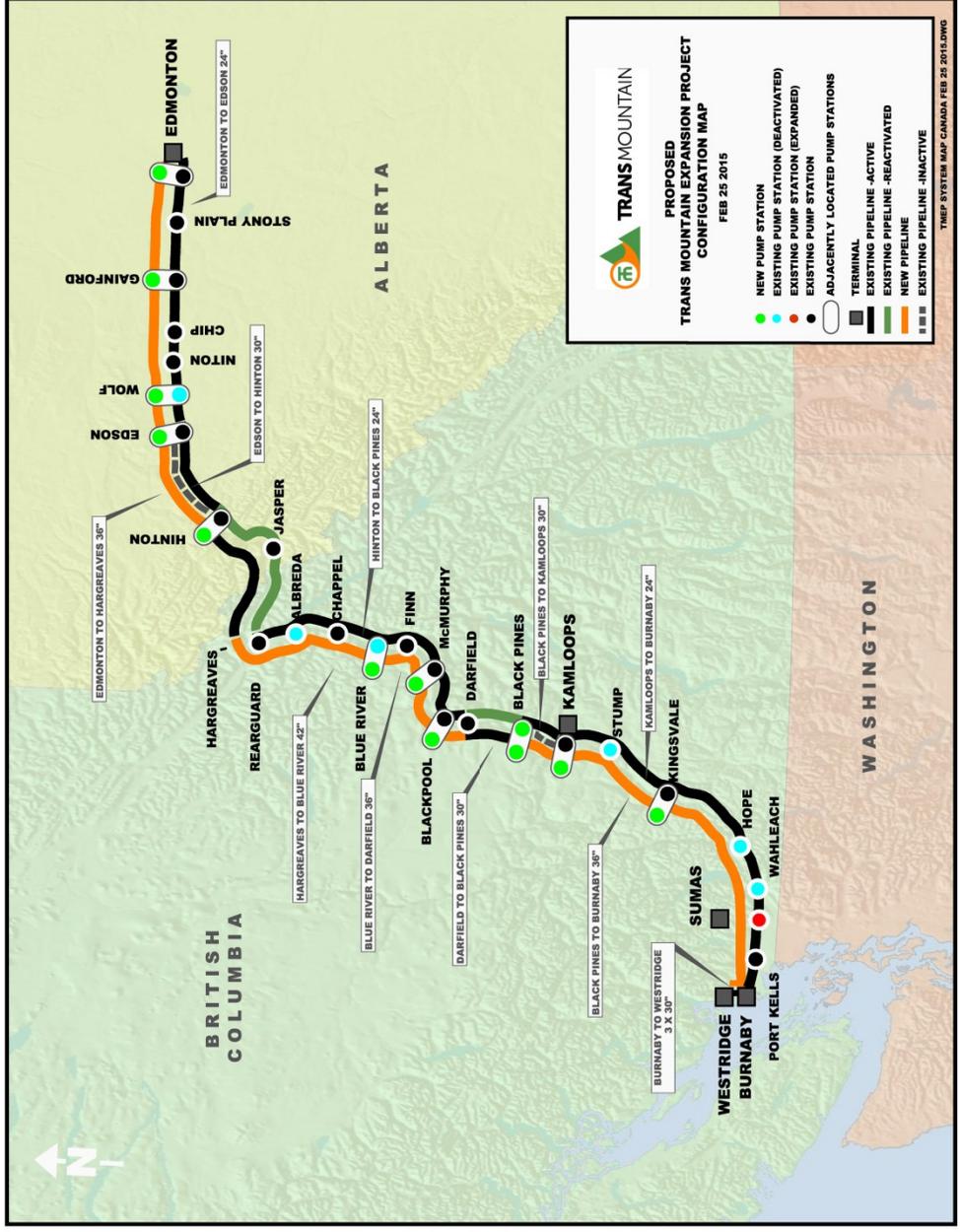
| WTABC Reference Number | WTABC Letter of Comment Content | TMEP Response |
|------------------------|---|---------------|
| |  <p>The map shows the Trans Mountain pipeline route from Burnaby, BC to Edmonton, AB. Key locations include Westridge, Burnaby, Port Kells, Sumas, Hope, Wapleach, Kingsvale, Stump, Kamloops, Black Pines, Darfield, McMurry, Finn, Chappel, Albrede, Jasper, Hinton, Edson, Wolf, Chip, Gainford, and Stony Plain. The map is color-coded to show different pipeline types: orange for new pipelines, green for existing pipelines, and grey for inactive pipelines. It also indicates the status of various pump stations and terminals. A legend in the top right corner provides a key for these symbols and colors. The map is titled 'PROPOSED TRANSMOUNTAIN EXPANSION PROJECT CONFIGURATION MAP' and is dated 'FEB 25 2015'.</p> | |

TABLE A-1

TMEP Response to Wilderness Tourism Association of BC (WTABC) Comments

| WTABC Reference Number | WTABC Letter of Comment Content | TMEP Response |
|------------------------|--|--|
| 4.3 | <p>The pipeline travels through or directly adjacent to some of the most significant nature based tourism areas of British Columbia, including Mt. Robson Provincial Park (near the headwaters of the Fraser River) and Wells Gray Provincial Park (near the headwaters of the Thompson River), which contain some of the province's (and the world's) most abundant wild salmon stocks, grizzly and Black bear habitat, caribou, moose, wolves, and other "charismatic mega-fauna" which our province's tourism brand is built.</p> | <ul style="list-style-type: none"> • Trans Mountain's website (http://www.transmountain.com/bc-parks) describes its expansion plans relative to BC Parks and Protected Areas. The website also provides information and links to Trans Mountain's Stage 2 Boundary Adjustment Application. • Trans Mountain's existing pipeline from Edmonton, AB to Burnaby, BC passes through eight BC Parks and Protected Areas. In planning for the proposed Expansion Project Trans Mountain was able to identify route alternatives that would avoid three of those parks: Coldwater River Provincial Park, Coquihalla River Provincial Park and Reatguard Falls Provincial Park. • In BC only three provincial parks (Finn Creek Park, North Thompson River Park, and Bridal Veil Falls Park), one protected area (Lac du Bois Grasslands) and one recreational area (Coquihalla Summit) would be impacted by the proposed Trans Mountain Expansion Project. • Following a 45 day public comment period that ran from August 28, 2014 to October 12, 2014, Trans Mountain submitted its Stage 2 Boundary Adjustment Application for the parks and protected area within the proposed pipeline corridor. BC Parks is reviewing the Application and will make a recommendation for each park before submitting for Ministerial review and Cabinet decision. If the adjustment application is approved, the Boundary Adjustment would result in the removal of land required for the Trans Mountain Pipeline Expansion right-of-way from the provincial park or protected area for the period of construction and until restoration is complete. • A Resources Use Permit was submitted in October 2014 for the recreation area. If the permit is approved, the Boundary Adjustment would result in the removal of land required for the Trans Mountain Pipeline Expansion right-of-way from the recreation area for the period of construction and until restoration is complete. • If the lands required for the Project are removed from the Finn Creek, North Thompson River and Bridal Veil Provincial Parks, the Ministry of Environment may seek government approval to establish those lands as a protected area under the Environment and Land Use Act to allow the |

TABLE A-1
TMEP Response to Wilderness Tourism Association of BC (WTABC) Comments

| WTABC Reference Number | WTABC Letter of Comment Content | TMEP Response |
|------------------------|---------------------------------|--|
| | | <p>Minister of Environment to continue to manage those areas.</p> <ul style="list-style-type: none"> • Following completion of Project construction, the lands removed from the parks through the Boundary Adjustment may be returned to park or protected area status with operations authorized under a park use permit. Operations would be limited to the right-of-way. As an example of Trans Mountain's commitment to environmental stewardship, the Trans Mountain system through Jasper National Park and Mount Robson Provincial Park seven years ago is setting new standards in pipeline construction and environmental restoration. Kinder Morgan Canada (KMC) committed to a five-year post-construction monitoring program of the Anchor Loop project. Since 2008, the program has been evaluating the success and effectiveness of environmental protection and restoration measures. The results show restoration efforts have been successful, as indicated by: <ul style="list-style-type: none"> • Successful establishment of seed-producing native grass species in upland areas, functional and stable riparian and wetland area, evidence of increasing species diversity in aquatic, riparian and terrestrial plant communities, forests located near the right-of-way show no increase in insect population or diseases following construction clearing, wildlife trees and visual barriers being used by wildlife as habitat features, and successful recovery of areas disturbed during construction. • Beyond rivers and streams, the team also carefully considered the project's impact on local wildlife, such as the Bighorn sheep, making every effort to limit the project's potential impact on local ecosystems. KMC fulfilled its promise to return the right-of-way and surrounding highly-visible and environmentally-sensitive area to its original condition prior to the construction. And in order to preserve the area's natural beauty and tourist attraction, the Company collaborated with Parks Canada to develop a restoration program to keep the integrity of the ecosystem. • In 2008 an expansion of a 158 km section of the Trans Mountain pipeline was completed through Jasper National Park and Mount Robson Provincial Park (the "Anchor Loop" Project). Great care was taken to manage project impacts including a Restoration Plan to ensure the project would result in a net ecological and cultural gain for both Jasper National Park and Mount Robson Provincial Park. In 2010, Kinder Morgan Canada received a prestigious Emerald Award from the Alberta Emerald |

TABLE A-1

TMEP Response to Wilderness Tourism Association of BC (WTABC) Comments

| WTABC Reference Number | WTABC Letter of Comment Content | TMEP Response |
|------------------------|--|---|
| 4-8. | <p>Most notably and concerning to the WTABC, the project would result in an increase in bulk crude tanker loading at Westridge Marine Terminal, from five (5) tankers per month to thirty four (34) tankers per month. This would mean that the present approximately 60 tankers per year navigating the pristine coastal waters of BC's west coast would increase to 408. This is an estimated 580% increase in tanker traffic in the Strait of Juan de Fuca, Haro Strait, Salish Sea (Georgia Strait), English Bay and Burrard Inlet. The pipeline expansion would also entail expanded transportation of light and heavy crude products by both rail and transport truck, although these increases may be variable and have not been quantified by the proponent.</p> | <p>Foundation. Each year, Emerald Awards "recognize and reward the excellent environmental initiatives undertaken each year by large and small corporations, individuals, not-for-profit associations, community groups and governments." More information about the Anchor Loop expansion is available at www.transmountain.com/anchor-loop</p> <ul style="list-style-type: none"> If approved, Trans Mountain expects tanker traffic to increase from about 60 tankers per year to around 408 per year. It is expected that the future mix of vessels will be primarily Aframax tankers (largest vessel permitted to transit Burrard Inlet) to achieve the desired throughput at Westridge Marine Terminal. The current two to three export oil barges per month and one to two import jet fuel barges per month are not forecast to change; only the tanker traffic is expected to increase as a result of the pipeline expansion. TMEP is unaware of how the expansion project would lead to an increase in crude rail or crude truck transportation. It is likely that the pipeline expansion would offset these means of transport. Additionally, there are no truck or rail oil transport measures considered within the Application or the current project as proposed. In order to accommodate the increase in traffic the Westridge Marine Terminal will be expanded. The existing single tanker berth will be replaced with three new berth faces. Existing marine traffic for the study area was assessed based on Automated Information System (AIS) data and other vessel traffic information. Using a combination of economic forecasting, regional project announcements, and interviews, the amount of future traffic has been forecast for 2018, 2020, 2025, and 2030. These projected traffic volumes were used in TERMPOL Study 3.15 (Filing ID A3S5F4) to estimate the probability of spills both with and without the proposed TMEP traffic for the years 2018 and 2028. The former is expected to be the first full year of service for TMEP, the latter is used to assess the effect of additional traffic growth on risk after 10 years of operation. The forecast is used to assess the effect of TMEP traffic on other users of the waterways and vice versa. The traffic study is discussed in detail in TERMPOL 3.2 (Filing ID A3S4R7). Information from the traffic study was used in Termpol 3.15 to calculate the contributions by vessel type to the annual distance sailed in the study area, since the total |

TABLE A-1
TMEP Response to Wilderness Tourism Association of BC (WTABC) Comments

| WTABC Reference Number | WTABC Letter of Comment Content | TMEP Response |
|------------------------|---------------------------------|---|
| | | <p>distance sailed by vessels is a better measure of navigational risk than simply the number of vessel sailings.</p> <ul style="list-style-type: none"> The assessment shows that if the project proceeds, the additional “sailed nautical miles” for the new Trans Mountain tankers will increase approximately 70 per cent from 2012 tanker mileage levels in the region. If all types of vessels (not just tankers) are included, the additional TMEP traffic represents an increase of just 3.2 per cent in the total nautical miles sailed. Additional tanker traffic calling at Westridge Marine Terminal due to the Trans Mountain Pipeline Expansion was compared with the projected 2018 traffic since the project estimated completion date is 2018. The comparison is suitable since the traffic increase from the project approval with the projected 2018 traffic counts to accurately estimate the impact the project will have on the waterways in 2018. With TMEP the tanker traffic east of the Second Narrows (Cross Section 5) just west of Westridge Marine Terminal is forecast to increase by (in 2018) by 209 per cent. Similarly, average tanker traffic for all cross sections is forecast to increase by about 136 per cent. Table 6-26 shows the projected forecasts of tankers compared with additional sailings of tankers from TMEP in 2018. Table 6-27 shows the projected forecasts of vessels compared with additional sailings of tankers from TMEP in 2018. |

TABLE A-1
TMEP Response to Wilderness Tourism Association of BC (WTABC) Comments

| WTABC Reference Number | WTABC Letter of Comment Content | TMEP Response | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------|--|---|---------------|--|--|------------|--------------|-------|-----|-----|-----------------|-----|-----|------|-----------------------|-----|-----|------|-------------------|-----|-----|------|------------------------|-----|-----|------|---------------|--|--|------------|--------------|--------|-----|----|-----------------|-------|-----|----|-----------------------|--------|-----|----|-------------------|--------|-----|----|------------------------|-------|-----|----|
| 5.3. | <p>However, we do not support the present project as it is constituted, and believe that the risks to businesses in our sector are immense, with little or no regard being given, to date, to preventing and mitigating these potential risks.</p> | <p>Table 6-26: Increase to Number of Tanker Sailings from TMEP Tanker Traffic</p> <table border="1"> <thead> <tr> <th>Cross Section</th> <th>Projected Sailings of Tankers in 2018 (without TMEP)</th> <th>Additional Sailings of Tankers from TMEP</th> <th>% increase</th> </tr> </thead> <tbody> <tr> <td>1 - Victoria</td> <td>1,515</td> <td>696</td> <td>46%</td> </tr> <tr> <td>2 - Haro Strait</td> <td>495</td> <td>696</td> <td>141%</td> </tr> <tr> <td>3 - Strait of Georgia</td> <td>487</td> <td>696</td> <td>143%</td> </tr> <tr> <td>4 - Burrard Inlet</td> <td>486</td> <td>696</td> <td>143%</td> </tr> <tr> <td>5 - Westridge Terminal</td> <td>333</td> <td>696</td> <td>209%</td> </tr> </tbody> </table> <p>Table 6-27: Increase to Number of Vessels Sailings from TMEP Tanker Traffic</p> <table border="1"> <thead> <tr> <th>Cross Section</th> <th>Projected Sailings of Vessels in 2018 (without TMEP)</th> <th>Additional Sailings of Tankers from TMEP</th> <th>% increase</th> </tr> </thead> <tbody> <tr> <td>1 - Victoria</td> <td>19,840</td> <td>696</td> <td>4%</td> </tr> <tr> <td>2 - Haro Strait</td> <td>9,505</td> <td>696</td> <td>7%</td> </tr> <tr> <td>3 - Strait of Georgia</td> <td>18,727</td> <td>696</td> <td>4%</td> </tr> <tr> <td>4 - Burrard Inlet</td> <td>13,061</td> <td>696</td> <td>5%</td> </tr> <tr> <td>5 - Westridge Terminal</td> <td>7,332</td> <td>696</td> <td>9%</td> </tr> </tbody> </table> <p>• Trans Mountain is committed to minimize potential effects of the Project, specifically the increase in tanker traffic and to manage and mitigate accidental risk related to the loading and transit of the tankers. As part of this commitment and to meet TERMPOL guidelines, Trans Mountain assigned Det Norske Veritas (DNV) to conduct a marine traffic and cargo</p> | Cross Section | Projected Sailings of Tankers in 2018 (without TMEP) | Additional Sailings of Tankers from TMEP | % increase | 1 - Victoria | 1,515 | 696 | 46% | 2 - Haro Strait | 495 | 696 | 141% | 3 - Strait of Georgia | 487 | 696 | 143% | 4 - Burrard Inlet | 486 | 696 | 143% | 5 - Westridge Terminal | 333 | 696 | 209% | Cross Section | Projected Sailings of Vessels in 2018 (without TMEP) | Additional Sailings of Tankers from TMEP | % increase | 1 - Victoria | 19,840 | 696 | 4% | 2 - Haro Strait | 9,505 | 696 | 7% | 3 - Strait of Georgia | 18,727 | 696 | 4% | 4 - Burrard Inlet | 13,061 | 696 | 5% | 5 - Westridge Terminal | 7,332 | 696 | 9% |
| Cross Section | Projected Sailings of Tankers in 2018 (without TMEP) | Additional Sailings of Tankers from TMEP | % increase | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 - Victoria | 1,515 | 696 | 46% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 - Haro Strait | 495 | 696 | 141% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 - Strait of Georgia | 487 | 696 | 143% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 - Burrard Inlet | 486 | 696 | 143% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 - Westridge Terminal | 333 | 696 | 209% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cross Section | Projected Sailings of Vessels in 2018 (without TMEP) | Additional Sailings of Tankers from TMEP | % increase | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 - Victoria | 19,840 | 696 | 4% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 - Haro Strait | 9,505 | 696 | 7% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 - Strait of Georgia | 18,727 | 696 | 4% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 - Burrard Inlet | 13,061 | 696 | 5% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 - Westridge Terminal | 7,332 | 696 | 9% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

TABLE A-1
TMEP Response to Wilderness Tourism Association of BC (WTABC) Comments

| WTABC Reference Number | WTABC Letter of Comment Content | TMEP Response |
|------------------------|--|--|
| 5.5. | <p>As shown by the pipeline rupture at the Kalamazoo River in Michigan, crude products such as diluted bitumen can be extremely difficult to contain and remediate from waterways. When a spill occurs from a pipeline or from a tanker the condensate evaporates and forms a poisonous cloud. The bitumen, being heavier than freshwater, sinks in waterbodies such as streams and rivers. In salt water, it sinks to a point in the water column where it reaches the density of the salt water, making surface containment a literal impossibility.</p> | <p>handling risk assessment and identification of potential risk reducing measures. The full report is available in Volume 8C, TERMPOL 3.1.5 General Risk Analysis and Intended Methods of Reducing Risks (Filing ID A3S5F4). At the same time, Trans Mountain has engaged Western Canada Marine Response Corporation (WCMRC) proposing significant improvements to the existing oil spill response regime for the area. The WCMRC 2013 study (Filing ID A3S5I9) describes an enhanced response regime capable of delivering 20,000 tonnes of response capacity within 36 hours with dedicated resources within the study area. This \$100 million enhancement represents a doubling of the response capacity and a delivery time of existing planning standards. These enhancements will reduce times for initiating a response to two hours for the harbour and six hours for the remainder of the study area and parts of the West Coast of Vancouver Island. These reduced times will be achieved by creating new bases locations along the tanker route. Meeting response capacities within the designated times requires redundancy of equipment, as a result the overall capacity of dedicated response equipment available in the area will be in excess of 30,000 tonnes. Also, based on the increased shoreline oiling identified by spill modelling, the recommendations by WCMRC is to have the means to deal with more shoreline cleaning, i.e. increase the existing shoreline cleaning standard from 500 m/day to 3,000m/day for this region.</p> <p>In May 2013, Trans Mountain conducted applied research on the fate and behaviour of dilbit in a marine environment (Gainford study, Polaris and WCMRC, 2013 [A3S5G7]). The purpose of the study was to further the knowledge of dilbit in general and, more specifically, to investigate the behavior of dilbit when spilled into a marine environment. Some of the basic questions to be answered were:</p> <ol style="list-style-type: none"> 1. Will diluted bitumens sink or float in marine waters? 2. Will diluted bitumens behave any differently than other heavy crude oils as they weather? 3. Is the performance of the equipment currently stockpiled by North American oil spill recovery organizations adequate to mechanically remove diluted bitumens off the surface of the water? |

TABLE A-1
TMEP Response to Wilderness Tourism Association of BC (WTABC) Comments

| WTABC Reference Number | WTABC Letter of Comment Content | TMEP Response |
|------------------------|--|--|
| | | <p>The study's multi-disciplinary Project Team was tasked with designing and executing a controlled test to evaluate the fate and behavior of dilbit discharged into a simulated marine environment similar to that of Burrard Inlet (Vancouver, BC, Canada) where the Westridge Marine Terminal is located. The Gainford study included a weathering test of dilbit spilled in a marine environment over a 10-day period.</p> <p>That study and other tests have shown that, like other crude oils, while the density increases as the lighter components evaporate, the rate at which this occurs diminishes as the density and viscosity of the oil increases. Although the relative density of the dilbit observed in the Gainford study reached that of fresh water, it took 8-10 days for this to happen. No evidence of sunken or submerged dilbit in the marine environment simulated for the tests was observed during the Gainford study. Typically, once released into the marine environment all hydrocarbons begin to "weather" and after a period of time can submerge or begin to sink. When released into water lighter components of hydrocarbons will begin to evaporate, some will dissolve into the water column, and the remainder will float as long as the density of the remaining oil is less than the density of the water into which it was released. Wave action can cause water-in-oil emulsions which will drive the mixture towards neutral buoyancy. Adhesion to bottom sediment (e.g., beaches, riverbeds) or other sinking material can cause the oil to be submerged. These are the mechanisms that caused some of the oil released in the Enbridge Kalamazoo spill to submerge in the river. Weathering processes are discussed in greater detail in Section 5.2 of Volume 7 of the Facilities Application (Filing IDs A3S4V5 and A3S4V6). A comparison of the properties of diluted bitumen crudes with other oils can be found in Technical Report 8C-12 S8 of Volume 8C (Filing ID A3S5G7).</p> |
| 5.6. | With the region's tides and currents being renowned for their strength and severity, particularly in the challenging navigation channels near Haro Strait, the diffusion of crude oil products would be immediate, unmanageable, and catastrophic. | Trans Mountain commissioned a number of studies as part of an iterative risk assessment process to properly evaluate the location and severity of threats to increased shipping of oils, including diluted bitumen oils by tanker from the Westridge Marine Terminal in Burnaby. These included: <ul style="list-style-type: none"> • a quantitative risk assessment conducted by DNV (General Risk |

TABLE A-1
TMEP Response to Wilderness Tourism Association of BC (WTABC) Comments

| WTABC Reference Number | WTABC Letter of Comment Content | TMEP Response |
|------------------------|--|---|
| | | <p>Analysis and Intended Methods of Reducing Risks, Volume 8C, TR 8C-12, TERMPOL 3.15 (Filing ID A3S5F4);</p> <ul style="list-style-type: none"> research and tests of representative diluted bitumen oil to better understand the characteristics of this type of oil (see Gainford Study in Volume 8C, TR 8C-12, S7 Filing ID A3S5G7); and, modelling to predict transport and fate of oil released from hypothetical spill scenarios by EBA (Modeling the Fate and Behaviour of Marine Oil Spills for the Trans Mountain Expansion Project (Volume 8C, TR 8C-12, S9 Filing ID A3S5G9). <p>Stochastic oil spill fate modelling simulations for the credible worst case scenario were performed for a complete annual cycle including winter (January to March), spring (April to June), summer (July to September), and fall (October to December) to take into consideration seasonal variations in winds and currents. To be conservative, no consideration was given to possible mitigation, such as oil spill response activities. Outputs of the stochastic modeling included: wind speed and direction charts, probability contours for surface water oiling, probability contours for shoreline oiling, time to first contact and length of shoreline oiling, length of shoreline contacted per coastal class, amount of dissolved oil, mass balance results (including on-water and on-shore oiling, oil evaporated, dispersed, biodegraded, and dissolved), as well as average slick area and thickness. Additional details of the stochastic modelling completed by EBA are provided in Modeling the Fate and Behaviour of Marine Oil Spills for the Trans Mountain Expansion Project (Filing ID A3S5G9).</p> |
| 5.7. | <p>The bitumen and oil products, known to be toxic to fish and wildlife at relatively low concentrations, would coat the benthic zone of our most critical marine habitats, and would spread to shoals, reefs, floodplains, and the overall intertidal zone of one of the most biodiverse temperate marine regions of the world.</p> | <p>The most critical and responsible emergency preparedness strategy is to prevent a spill from occurring at all. However, in the case of a spill, Trans Mountain is prepared to respond quickly with detailed emergency procedures and trained professionals. The amount and type of equipment used in any spill response operation is governed by the environmental conditions prevalent in the area of the incident. Most areas of response can be divided into a number of distinct operating environments, based on factors such as</p> |

TABLE A-1
TMEP Response to Wilderness Tourism Association of BC (WTABC) Comments

| WTABC Reference Number | WTABC Letter of Comment Content | TMEP Response |
|------------------------|---------------------------------|---|
| | | <p>wind, sea state, tides, currents, and bathymetric features. These operating environments are defined as follows:</p> <ul style="list-style-type: none"> • Unsheltered waters — waters where on-water oil recovery operations are normally affected by environmental conditions. Larger vessels or ships are normally needed to operate safely in these waters. • Sheltered waters — waters where on-water oil recovery operations can be carried out effectively with minimal disruption from environmental conditions. As an example, this environment is one in which small barges (18m - 30m) and small boats (6m–12m) can operate safely. • Shoreline — the intertidal zone between the maximum low tide and maximum high tide, including the back shore area affected by storm conditions. (Note: Includes some on-water oil recovery capability for near shore treatment operations, due to the rise and fall of the tide and the resultant immersion of the intertidal zone). <p>As the certified Response Organization for coastal waters of British Columbia, WCMRC is required to be able to respond to a 10,000 tonne² oil spill. However, the WCMRC 2013 study (Filing ID A3S519) describes an enhanced response regime capable of delivering 20,000 tonnes of response capacity within 36 hours with dedicated resources within the study area (see response to 5.3 above).</p> <p>To meet this challenge WCMRC maintains a cache of equipment and personnel capable of providing adequate response to the spills that may be expected in its geographic area of response (GAR). WCMRC is funded through a tariff charged to every vessel transporting petroleum to or from ports of the West Coast of Canada. WCMRC is composed of a team of spill response professionals trained specifically in the response to and recovery of water-based oil spills. Their ability to effectively manage and direct spill response procedures within the first few hours after response activation significantly reduces the negative impacts oil can have on the surrounding environment. In the event of a spill, WCMRC personnel immediately respond</p> |

TABLE A-1
TMEP Response to Wilderness Tourism Association of BC (WTABC) Comments

| WTABC Reference Number | WTABC Letter of Comment Content | TMEP Response |
|------------------------|---|---|
| 5.8. | <p>Notably, a number of the region's keystone species are already under threat and/or have sensitive and declining populations. Most notable is the region's once abundant salmon populations, including Chinook, Sockeye, Pink, Chum, and Coho. Many other important species that are relied upon by the tourism industry in this region include orcas, dolphins, sea otters, seals, sea lions, and others. A catastrophic spill in this region would threaten most or all of these species.</p> | <p>with carefully designed strategies and countermeasures. WCMRC maintains various response-oriented warehouses and equipment caches that can be activated such as containment booms, skimmers and vessels. WCMRC is working through coastal mapping process to identify sensitive areas through an extensive engagement process. A credible worst case spill scenario at the Westridge Marine Terminal resulting from an incident during loading of a tanker was outlined in Volume 7, Section 8.0 of the facilities application "A Hypothetical Scenario: Westridge Marine Terminal Release Reaching Burrard Inlet".</p> <p>As noted above, spill prevention is critical so as to avoid any adverse impacts to the marine environment – no marine spill is acceptable to TMEP. Nonetheless a Preliminary Quantitative Ecological Risk Assessment (PQERA) Technical Report (TR 8B-7 of Volume 8B, Filing ID A3S4KZ) was prepared to evaluate the ecological risks that could arise following accidental crude oil spills along the marine transportation route for loaded vessels leaving the Westridge Marine Terminal (WMT) between the Port of Vancouver and international waters west of Juan de Fuca Strait. The Detailed Quantitative Ecological Risk Assessment was later filed with the NEB on May 14, 2014 in response to NEB IR No. 1.64d) Attachment 1 (NEB Filing ID A3W9K1)</p> <p>The primary focus of the PQERA was the evaluation of the potential negative environmental effects to marine ecological receptors that could result from a hypothetical accidental crude oil spill during marine transportation. Cold Lake Winter Blend (CLWB) was identified as a representative diluted bitumen for this purpose. The selection of the accident locations was informed by consideration of navigational hazards, as well as ecological and socio-economic values in their vicinity. Stochastic oil spill fate modeling that was carried out to support the PQERA provides consideration of a range of weather and marine conditions that could prevail during an accidental oil spill, including season-specific behaviour, trajectories, and fate. Spatial boundaries for this PQERA included the geographic extent where potential effects were expected to be measurable and considered the oil spill footprint, as well as a Regional Study Area (RSA) surrounding the marine shipping lanes, which</p> |

TABLE A-1
TMEP Response to Wilderness Tourism Association of BC (WTABC) Comments

| WTABC Reference Number | WTABC Letter of Comment Content | TMEP Response |
|------------------------|---|---|
| 5.10. | <p>We were shocked to learn that Trans Mountain's own estimate of the probability of a notable spill over the next 50 years is 19%, whereas the probability of a major, catastrophic spill (8.25 million litres or more) is ten percent (10%).^{viii} According to the DNV report commissioned by Trans Mountain, the probability of a catastrophic oil spill in the region is "only" increased by 30% with the introduction of this single project. The likelihood of a minor oil spill (<10m3) increases from once every 234 years to once every 34 years, while the probability of a worst-case spill increases from once every 1,655 years to once every 234 years.^{ix} The very use of qualifying terms such as a spill "only" once every 34 years is troubling and calls into question the grasp of the seriousness of the issue by the project proponent, Kinder Morgan / TMP and its consultants. We would consider this risk increase to be significant. The same DNV report also comments that "...in the majority of these vessels the bunker oil tanks will be protected by a double hull," and are less likely to rupture in the event of minor accidents. For an issue of this magnitude, the qualifier 8 "majority" provides little comfort to our stakeholders regarding quality control of these vessels. Are 51% of the bunker oil tanks protected by a double hull? 99%? Are double hulls not a statutory requirement for these Aframax vessels?</p> | <p>extend from the WMT through Burrard Inlet, south through the southern part of the Strait of Georgia, the Gulf Islands and Haro Strait, westward past Victoria and through the Juan de Fuca Strait, to the 12 nautical mile limit of Canada's territorial sea. The northern boundary of the RSA was limited to the southern portion of the Strait of Georgia.</p> <p>Six hypothetical oil spill scenarios were evaluated as part of this PQERA which can be found in Section 4.4 of Technical Report TR-8 B7 "Ecological Risk Assessment of Marine Transportation Spills (Filing ID A3S4K7)". These include scenarios representing two crude oil spill volumes at each of three potential spill locations (Strait of Georgia, Arachne Reef in the Gulf Islands, and Race Rocks in the Juan de Fuca Strait).</p> <p>Again, to be clear – no oil spill is acceptable. Significant efforts are in place today and proposed as part of this Application to prevent any marine spill. As part of a duly comprehensive Application, Trans Mountain considers and seeks to quantify this risk to understand it, not to set out what it believes to be acceptable or not. Anticipated tanker traffic associated with TMEP represents an incremental increase to the daily marine vessel traffic that currently occurs in Burrard Inlet. As stated in Trans Mountain's response to NEB IR No. 3.74a (Filing ID A4H1V2), based on 2012 AIS data, vessels (tankers and barges) calling at the Westridge Marine Terminal currently constitute three per cent of all traffic (Volume 8C, TERMPOL 3.2 [A3S4R7 and A3S4R8]). This number is expected to increase to 11 per cent of all traffic in the future, should the Project be approved. The percentage of Project-related marine vessels is relatively conservative because it is very possible that other terminals in this area might expand their vessel calls beyond what has been forecasted. This incremental increase due to the proposed Project is only a portion of the projected cumulative increase in marine traffic, based on likely industry developments.</p> <p>The previous oil spill frequency calculation has changed. See NEB IR No. 4.13a (Filing ID A4K4W3).</p> <p>The section from the DNV report that mentions "only" is copied below: The</p> |

TABLE A-1
TMEP Response to Wilderness Tourism Association of BC (WTABC) Comments

| WTABC Reference Number | WTABC Letter of Comment Content | TMEP Response |
|------------------------|---|--|
| 5.19. | <p>The estimated 580% increase in bulk crude tanker traffic in the confined straits and channels of the southwest coast of British Columbia would have a notable impact on the overall quality of the natural surroundings in the region.</p> | <p>conclusion of these results is:</p> <ul style="list-style-type: none"> With the Trans Mountain Expansion Project, the Trans Mountain tanker traffic will increase by about 580 per cent and so will the in transit oil cargo spill accident frequency related to the Trans Mountain tanker traffic if further mitigation measures are NOT implemented. With additional risk mitigation measures, i.e. increasing the escort tug level and implementing a moving safety zone as described in Case 1b, the in transit oil cargo spill frequency will only increase by 31 per cent. <p>The term “only” should not be read in relationship to this direct increase in spill frequency during loading at Westridge (once in 34 years with the project). All vessels built after August 2010 are provided with double hull bunker tanks. This is common to ALL vessels, non-tankers and tankers. Further, tanker acceptance criteria are in place at Westridge Marine Terminal (see Section 3 of Technical Report TR 8C-07 TERMPOL 3.9 – Ship Specifications found in Volume 8C Marine Transportation (Filing ID A3S4T2)).</p> <p>This statement is incorrect. As stated in the response to 5.10, vessels (tankers and barges) calling at the Westridge Marine Terminal currently constitute three per cent of all traffic in the Salish Sea (Volume 8C, TERMPOL 3.2 [A3S4RZ and A3S4RB8]). Potential effects and mitigation measures related to the increase in project-related marine vessel traffic on traditional marine resource use are discussed in Volume 8B, Section 6.0. (Filing ID A56022).</p> <p>Trans Mountain’s corporate responsibility and regulatory obligation is to first minimize any potential impacts or damages to the extent practical by using and adapting responsive construction and operations practices; and second, provide mitigation to reverse or treat any remaining impacts. A comprehensive assessment of potential impacts is documented in the Environmental and Socio-Economic Assessment included in Volume 5A (Filing IDs A3S1Q9, A3S1R0, A3S1R1 and A3S1R2), Volume 5B (Filing IDs A3S1S7, A3S1S8, A3S1S9 and A3S1T0). Pipeline and Facility specific</p> |

TABLE A-1
TMEP Response to Wilderness Tourism Association of BC (WTABC) Comments

| WTABC Reference Number | WTABC Letter of Comment Content | TMEP Response |
|------------------------|--|--|
| 5.21. | <p>In the case of the TMP project, the cumulative visual impacts of an estimated 800 or more (one-way) passages of bulk crude tankers in the narrow confines of the region's marine corridors would pose a range of potential deterring impacts for clients of some specific nature based tourism product sectors, particularly whale watching, sport fishing, pleasure cruises, kayak tours, scuba diving, and other activities that are predicated on the pristine environment of the region. There would also be ancillary and likely lesser impacts – though still noteworthy – on land-based activities such as beach-going, golfing, and hiking, where the oil shipping routes would be in prominent view.</p> | <p>Environmental Protection Plans (EPPs) were provided in Volume 6B (Filing IDs A3S2S3 and A3S2S4) and Volume 6C (Filing IDs A3S2S6 and A3S2S7), respectively. These EPPs contain recommended mitigation measures and contingency plans for anticipated impacts that could be experienced during construction.</p> <p>Please refer to the TMEP response to 4.8 above for the correct percentage increase in tanker traffic in Georgia Strait, Haro Strait, Burrard Inlet, WMT and Strait of Juan de Fuca (Victoria).</p> <p>Visual modelling was conducted of the proposed expanded Westridge Marine Terminal from three vantage points in the Metro Vancouver Region: from the Capitol Hill neighbourhood in the City of Burnaby; Cates Park in the District of North Vancouver; and the Belcarra Picnic Area. Visual simulations from these observer viewpoints are provided in the Application, Technical Report 5D-5 in Volume 5D, Viewshed Modelling Analysis Technical Report (TERA Environmental Consultants December 2013) (Filing IDs A3S2K2, A3S2K4 and A3S2K6) in the following figures:</p> <ul style="list-style-type: none"> • Figures 4.10 & 4.11: from the vantage point of Cates Park, across the Burrard Inlet in the District of North Vancouver (approximately 1.3 km north of the WMT) • Figures 4.12 & 4.13: from Capitol Hill neighbourhood in the City of Burnaby (approximately 1.9 km west of the WMT) • Figures 4.14 & 4.15: from Belcarra Picnic Area, across the Burrard Inlet (approximately 3.2 km northeast of the WMT) |
| 5.23. | <p>However, these potential impacts on human activity, including but not limited to tourism, appear to focus exclusively on the land - based component of the project and not the marine component. In addition, the actual ESA is not published on the Trans Mountain website so we have no way of knowing the details of the potential risks and mitigation strategies being considered.</p> | <p>The ESA was filed with the Facilities Application and is available on the Trans Mountain website in Volumes 5A, 5B, 5C and 5D (http://www.transmountain.com/facilities-application). The marine-based components of the Project, including marine tourism are discussed in Volume 8B, TR8B-6 of the Facilities application which is available on the NEB website (Filing IDs A3S4K4, A3S4K5 and A3S4K6) and the Trans Mountain website (http://transmountain.s3.amazonaws.com/application14/V8B_MAR_TRANS)</p> |

TABLE A-1
TMEP Response to Wilderness Tourism Association of BC (WTABC) Comments

| WTABC Reference Number | WTABC Letter of Comment Content | TMEP Response |
|------------------------|--|---|
| 5.24. | <p>We thus conclude that, to date, no analysis or planning has been undertaken to assess visitor sensitivity to visual impacts of bulk crude tanker or other container 10 ship traffic in ecotourism-intensive zones. Based on prior research in the field of forestry, however, we expect these impacts to be low to moderate for the type of visual impact that could be expected to result from this project, a level of impact that would require some mitigation.</p> | <p>TECH_RPT/0597.html.</p> <p>Environmental Protection Plans were also filed with the Facilities Application and are available on the Trans Mountain website provided above, in Volumes 6A, 6B, 6C, 6D and 6E and the NEB website (Filing ID A56013). Specifically, the Westridge Marine Terminal EPP in Volume 6D identifies mitigation measures to be implemented during Project activities; provides instructions for carrying out construction activities in a manner that will avoid or reduce adverse environmental effects; and serves as reference information for the environmental inspection staff to support decision-making process and provides direction to more detailed information (<i>i.e.</i>, resource-specific mitigation management and contingency plans, etc.).</p> |
| 5.25. | <p>The estimated 580% increase in bulk crude tanker traffic would also result in incremental deterioration of the region's air quality and water quality. These impacts will be exacerbated in the more constricted navigational points such as near Sidney Island, Turn Point, South Pender Island, and Saturna Island,</p> | <p>Marine-based eco-tourism operations that were identified as being potentially affected by the construction and operation of the expanded Westridge Marine Terminal include commercial marine tourism operators that depend on the quality of the recreational experience for their livelihood, which includes ecotourism operators such as whale-watching and wildlife-viewing tour operators and kayak tour guides. Section 4.5 of Technical Report 8B-6 in Volume 8B, Marine Commercial, Recreational and Tourism Use – Marine Transportation Technical Report (Vista Strategy Corp. and TERA Environmental Consultants December 2013) (Filing ID A3S4K6) provides information on marine tourism activities in Burrard Inlet, the Strait of Georgia, Haro Strait and Juan de Fuca Strait. While this report is focused on Marine Transportation and not the construction and operations of the Westridge Marine Terminal, it provides the detailed context for marine tourism use in the Burrard Inlet, which is the marine area potentially affected by the construction and operations of the Westridge Marine Terminal. Refer to the TMEP response to IR No 1 from Canadian Parks and Wilderness Society (CPAWS) - BC Chapter (Filing ID A3X5X8).</p> <p>The increase in traffic as stated is incorrect. Please see 5.19 above for a discussion regarding the estimated percentage increase in bulk crude tanker traffic.</p> |

TABLE A-1
TMEP Response to Wilderness Tourism Association of BC (WTABC) Comments

| WTABC Reference Number | WTABC Letter of Comment Content | TMEP Response |
|------------------------|---|--|
| | <p>where delays in passage may occur. These cumulative impacts on air and water pollution could be notable, particularly during the summer peak tourism season.</p> | <p>In the Executive Summary of Technical Report 8B-3 of Volume 8B of the Application (Filing ID A3S4JZ), Trans Mountain acknowledges that the Project will result in the following air emissions:</p> <ul style="list-style-type: none"> • criteria air contaminants (CACs), a group of commonly found contaminants typically formed from combustion for which there are ambient air quality criteria, including PM, carbon monoxide (CO), nitrogen dioxide (NO₂), and sulphur dioxide (SO₂); • Volatile organic compounds (VOCs) 1, a group of organic compounds with sufficiently high vapour pressures under ambient conditions to evaporate from the liquid form of the compound and enter the surrounding air; and, GHGs, including carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). <p>Through its public consultation and Aboriginal engagement efforts, Trans Mountain received feedback related to marine transportation/the Project, including concerns regarding:</p> <ul style="list-style-type: none"> • increases in CAC and greenhouse gas emissions as a result of increased vessel traffic; • increases in odour emissions as a result of increased vessel traffic; and, • Potential for the development of ozone and secondary particulate matter due to the increase in vessel traffic. <p>In order to study the potential effects of the Project on air quality, Trans Mountain engaged RWDI Consulting Engineers & Scientists to conduct an extensive air quality study. The results of the study are included in the Application, Volume 8B - Marine Air Quality and Greenhouse Gas Marine Transportation Technical Report for the Trans Mountain Pipeline ULC Trans Mountain Expansion Project (Filing IDs A3S4J7, A3S4J8, A3S4J9, A3S4K0, A3S4K1). The air quality mitigation measures that resulted from the study are</p> |

TABLE A-1
TMEP Response to Wilderness Tourism Association of BC (WTABC) Comments

| WTABC Reference Number | WTABC Letter of Comment Content | TMEP Response |
|------------------------|---|--|
| 5.26. | <p>According to the Government of Canada Commission of Inquiry into the Decline of Sockeye Salmon in the Fraser River (the "Cohen Commission") report, Volume 2, published in October 2012, the most likely cause of decline of the Fraser River sockeye run in 2009 was "ocean conditions (physical and biological) inside Georgia Strait." The report cites cumulative impacts of municipal wastewater/sewage, industrial activity, shipping, and other non-- point source contamination to be potentially significant factors impacting water quality and marine habitats, creating adverse oceanic conditions for migratory salmon. Adverse water quality in the Georgia Strait in particular was singled out as a potentially significant stressor of wild salmon along their migratory paths.</p> | <p>included in the report, in Table 7.1 (Filing ID A3S4J7).</p> <p>Further updates to the report were conducted and are included in Technical Update #2 (Filing ID A4A4E3) and Technical Update #4 (Filing IDs A4F5H7, A4F5H8, A4F5H9, A4F5I0, A4F5I1, A4F5I2).</p> <p>Ultimately, Trans Mountain will ensure that all Project-related tankers will, at minimum, adhere to federal standards that may reduce air emissions, including standards for bunker fuel, and GHG emissions.</p> <p>Salmon habitat enhancement in Burrard Inlet is of interest to many stakeholders that provided feedback at Trans Mountain engagement events related to marine development. As referenced in City of Port Moody IR 2.5.2 a) Marine Ecosystem Resiliency (Filing ID A4H8G7):</p> <ul style="list-style-type: none"> Beyond standard environmental mitigation and compensation measures, Trans Mountain, in cooperation with local communities, Aboriginal groups, regulatory authorities, and other stakeholders is committed to exploring ways to help further recovery of fish habitat that may be affected by TMEP activities. In response to stakeholder feedback and input from Aboriginal groups identifying salmon habitat as a priority for Burrard Inlet, Trans Mountain has already committed a \$50,000 donation in January 2015 to the Pacific Salmon Foundation (PSF) for the purposes of Salmon Habitat enhancement in Burrard Inlet (refer to City of Port Moody IR No. 2.5.2a - Attachment 1 (Filing ID A4H8I4)). Trans Mountain has also confirmed it will replace an aging fish pen located at Westridge Marine Terminal that has been used for over 20 years (since 1992) in a community partnership with KMC and Fisheries and Oceans Canada (DFO) (refer to City of Port Moody IR No. 2.5.2a – Attachment 2 (Filing ID A4H8I5)). The initiative began in 1992 as part of the federal Salmonid Enhancement Program with the goal of increasing the number of salmon in Burrard Inlet. DFO staff transport Coho and Chinook salmon from local hatcheries to the Westridge Marine Terminal in Burnaby, where the fish are placed in |

TABLE A-1

TMEP Response to Wilderness Tourism Association of BC (WTABC) Comments

| WTABC Reference Number | WTABC Letter of Comment Content | TMEP Response |
|------------------------|--|--|
| 5.27. | <p>As mentioned previously, the WTABC is also concerned about a possible pipeline rupture in the overland corridor of the Trans Mountain Pipeline. While some of these concerns are mitigated by the fact that this project primarily replaces and expands on an existing pipeline, the overall project nonetheless increases the incremental pipeline rupture risk over the long term. With two pipelines in place, and a tripling of capacity, a potential rupture is both more likely and would be more severe.</p> | <p>a pen to become acclimatized to salt water. The salmon smolts are fed by Trans Mountain employees for seven to ten days, before the fish are released with help from students from Westridge Elementary School.</p> <p>To clarify, the proposed Project is to complete the twinning of the existing pipeline system by adding approximately 994 km of new pipeline. 73% of the proposed route will use the existing right-of-way, 17% would follow other linear infrastructure such as TELUS, Hydro or highways, and 10% would be new right-of-way. See Section 2.8.2.5 in Volume 4A (NEB Filing ID A3S0Y8)</p> <p>Oil pipelines such as TMEP are not designed to have a limited life, because the fundamental material properties of steel do not change appreciably with time, and therefore pipelines have an indefinite life as long as preventative maintenance and integrity management practices are in place. Kinder Morgan Canada has a strong focus on regular preventive maintenance and a well-developed integrity management program including regular inspections with the best available In Line Inspection (ILI) technology. With application of the latest technology, and sound operating practices, the TMP has an indefinite lifespan.</p> <p>Improvements have been made in pipe steel metallurgy, pipe manufacturing, and inspection and quality control processes. Improvements have also been made in the materials for coating pipelines and for the application and testing of coatings to protect the pipe from time dependent degradation mechanisms like external corrosion. These material advancements coupled with improved engineering design standards and practices and construction improvements make the risk of a failure on a new pipeline extremely low. Similarly, technological advancements have been incorporated into today's integrity management programs, including risk management, and these programs are designed and regulated to reduce the risk of a spill on existing pipelines, such as TMP, to a similarly low probability.</p> <p>Section 8.0 of Volume 4C of the Application (Filing ID A3S1L1) provides information on System Integrity Management including Risk Assessment. Oil spill risk assessments are discussed in Section 3.0 of Volume 7the Facilities</p> |

TABLE A-1

TMEP Response to Wilderness Tourism Association of BC (WTABC) Comments

| WTABC Reference Number | WTABC Letter of Comment Content | TMEP Response |
|------------------------|---|--|
| 5.28. | <p>During construction of the pipeline, it is expected that there will be some positive and negative impacts on nature based tourism related to construction employment. There may be some nominal positive economic impacts in our industry resulting from the induced impacts of work crews (spending of construction crew salaries on nature based tourism and/or lodging). While these have not been quantified, they are expected to be minimal for the nature based tourism sector. We expect that the overall accommodation and foodservices sector will stand to benefit more significantly from these induced impacts.</p> | <p>application (Filing ID A3S4V5).</p> <p>Worker expenditures along the pipeline corridor are described in Technical Report 5D-3 of Volume 5D in the Application (Filing ID A3S2J7). Findings are consistent with WTABC assumption that biggest expenditure categories are expected to be on meals and accommodation, however third largest category is recreation products and services (\$42M).</p> |
| 5.29. | <p>On the other hand, there are anticipated negative impacts that are expected to result during the construction phase. The pipeline traverses regions that are extensively used by tenured tourism operators such as wilderness guides and public recreationists (hikers, skiers, snowmobilers). Some of these areas may be closed to tenured tourism operators, there will be increased vehicle traffic and noise, and other possible impacts on tourism businesses.</p> | <p>Short-term impacts resulting from construction of the proposed expansion can be mitigated both by time (given the short term nature of pipeline construction) and the confined area of construction. The limited area affected, the limited duration of construction and the restoration following construction all work together to mitigate impacts for recreation users. Furthermore, access across trails can be maintained during construction and restoration activities to avoid having larger areas closed off from recreation use.</p> <p>Section 11.4 of Technical Report 5D-2 of Volume 5D of the Application (Filing ID A3S2J5) describes anticipated effects on Human Occupancy and Resource Use – including marine commercial, recreational and tourism use related to the Westridge Marine Terminal - as well as mitigation measures that have been established to minimize negative effects and enhance Project-related opportunities.</p> <p>The Socio-Economic Effects Assessment in Volume 5B (Filing ID A3S1R4) evaluates the socio-economic effects of the construction, operations and decommissioning phases of the project and where necessary identifies site-specific mitigation measures. In addition, Trans Mountain has prepared a Socio-Economic Management Plan (Appendix C of Volume 6B) (Filing ID A3S2S3) that provides more detail regarding mitigation and enhancement measures proposed by Trans Mountain to manage the socio-economic effects of the Project.</p> |

TABLE A-1
TMEP Response to Wilderness Tourism Association of BC (WTABC) Comments

| WTABC Reference Number | WTABC Letter of Comment Content | TMEP Response |
|------------------------|--|--|
| 5.31. | <p><i>Table 1: Risk Analysis of TMP Expansion on B.C. Nature Based Tourism</i></p> | <p>In the preceding responses Trans Mountain has corrected the assumptions laid out in Table 1. Trans Mountain welcomes the opportunity to meet with the WTABC to clarify any questions WTABC may have about the Project and better understand concerns raised in the WTABC letter of comment. To schedule a meeting with Trans Mountain, please contact</p> <p>Stephanie Snider Regional Specialist, Stakeholder Engagement 604.781.8389 Stephanie_Snider@transmountain.com</p> |
| 5.32 | <p>The primary though not exclusive concern registered by the WTABC in these proceedings is related to the specific routing of the marine shipping component of this project. This region has the highest density of marine-based "trails" (common marine recreation pathways), docks, mooring sites, beach campsites, and other amenities used by tourists and recreationists in B.C.</p> | <p>It is important to note that tankers calling on Westridge Marine Terminal today and post-expansion, are utilizing existing and well-established marine shipping lanes. In concert with the Application submitted to the NEB for review, Trans Mountain also participated in a TERMPOL review process, under the direction of Transport Canada. TERMPOL is a voluntary technical review that focuses on the route ships will take within Canadian waters and includes the process of cargo transfer from ship to shore. The intent of TERMPOL is to identify opportunities for improvement of a specific project proposal to better enhance marine safety.</p> <p>The TERMPOL review is based on technical studies prepared by Trans Mountain (Volume 8C of the Application, Filing ID A56023). These studies were submitted to the TERMPOL Review Committee, a committee composed of representatives from federal departments or agencies with marine regulatory responsibilities who are subject matter experts. The Committee conducted its review and Transport Canada subsequently published its report on 11 December 2014 (Filing ID A4F8Z4). The report is intended to assist Trans Mountain in establishing the marine safety aspects of the Project.</p> <p>In TERMPOL Review Process Report on the Trans Mountain Expansion Project, Transport Canada states, "The shipping route to and from Trans Mountain's terminal to the open sea is well established and used by deep sea tankers as well as other vessel types such as cargo vessels, cruise ships, and ferries."</p> |

TABLE A-1
TMEP Response to Wilderness Tourism Association of BC (WTABC) Comments

| WTABC Reference Number | WTABC Letter of Comment Content | TMEP Response |
|------------------------|--|--|
| 5.35 and 5.36 | <p>Figure 3: Recognized Marine Recreation Use Areas in SW B.C. demonstrates, there is a dense clustering of marine recreation sites in the Southwestern corner of B.C. These regions would be impacted by a catastrophic oil spill as well as from cumulative impacts from minor spills, and/or ancillary impacts from visuals, noise, air, and water pollution.</p> | <p>Liquid bulk carriers of the size proposed under the Project currently use the existing route to transport crude oil.</p> <p>There are already a number of safeguards and requirements in place along the route that contribute to marine safety.”</p> <p>Furthermore, Finding #9 of the report states, “Trans Mountain’s commitment to require via its tanker acceptance process that Project tankers steer a course no more northerly than due West (270°) upon exiting the Juan de Fuca Strait will enhance safety and protection of the marine environment by providing the shortest route out of the Canadian EEZ.”</p> <p>Given the statements contained in the TERMPOL Report, and Trans Mountain’s own research and findings (contained in the Application), Trans Mountain is confident in the safe passage of its vessels along the proposed shipping route.</p> <p>References:</p> <p><i>TERMPOL Review Committee. 2014. TERMPOL Review Process Report on the Trans Mountain Expansion Project. Ottawa, Ont. 57 pp.</i></p> <p>In TMEP’s Application, potential Project-related effects on Marine commercial, recreational and tourism use were identified. These effects include:</p> <ul style="list-style-type: none"> • interactions between Project-related marine vessels and other marine users, where other marine activity uses or crosses the designated shipping lanes; • possible physical disturbances to shoreline areas or marine facilities from the wakes generated by Project-related marine vessels, where the shipping lanes are near shore; • possible physical disturbances to small vessels from the wakes generated by Project-related marine vessels; |

TABLE A-1
TMEP Response to Wilderness Tourism Association of BC (WTABC) Comments

| WTABC Reference Number | WTABC Letter of Comment Content | TMEP Response |
|------------------------|---|--|
| | | <ul style="list-style-type: none"> • sensory disturbance of marine users due to transits of Project-related marine vessels; and • the presence of Project-related marine vessels contributing to negative perspectives of marine users. <p>Volume 8B of the Application (Filing ID A56022), the Marine Commercial, Recreational and Tourism Use Technical Report, discusses these potential effects at length and Table 5.3.1 of the Report provides mitigation measures related to increased project-related marine vessel traffic on marine commercial, recreational and tourism use.</p> <p>As part of Trans Mountain's assessment of the risks of increased shipping of crude oils, including diluted bitumen oils by tanker from their Westridge Marine Terminal in Burnaby, several risk assessment studies have been undertaken including, but not limited to, a quantitative risk assessment (conducted by DNV), an ESA (conducted by TERA, 2013), research and tests of representative diluted bitumen crude oil to better understand the characteristics of this type of crude oil (Polaris & WCMRC, 2013) and the fate and behaviour of the oil through spill modelling by EBA, A Tetra Tech Company (EBA).</p> <p>Mitigation of risks is an essential consideration in Trans Mountain's submissions, both in terms of avoiding accidents and reducing their consequences should they occur. The existing tanker safety regime is based on local experience and international best practices. It is comprehensive, well established, and has proven to be effective.</p> <p>Further to the current safety regime, Trans Mountain engaged WCMRC to propose enhanced planning standards and how they could be implemented to accommodate additional marine traffic that will result from the project. WCMRC is the certified Canadian oil spill response organization that operates along B.C.'s coast.</p> |
| 5.37 | Perhaps most notable, the Northern Saanich Peninsula and Southern Gulf Islands are world-renowned recreation and boating destinations, and pillars of | As discussed in 5.36 above, Trans Mountain is aware of potential Project-related effects on marine commercial, recreational and tourism use. This is |

TABLE A-1
TMEP Response to Wilderness Tourism Association of BC (WTABC) Comments

| WTABC Reference Number | WTABC Letter of Comment Content | TMEP Response |
|------------------------|---|--|
| | <p>BC's nature based tourism sector. This region is also the most significant navigational constriction point (outside of the Burrard Inlet bridges), making an increase in bulk crude tanker traffic in this region a higher risk to nature based tourism revenues in B.C.</p> | <p>discussed in detail in Technical Report 8B-6 of Volume 8B of the Application, the Marine Commercial, Recreational and Tourism Use Technical Report (Filing IDs A3S4K4, A3S4K5 and A3S4K6).</p> <p>The sailing route from Westridge Marine Terminal to high seas outside the mouth of Juan de Fuca Strait is a relatively uncomplicated route from a navigational perspective. The most challenging part is the start of the route from the terminal through the Second and First Narrows in the Vancouver harbour area, which is a Movement Restricted Area (MRA). The whole sailing route has a traffic separation scheme (TSS) and is monitored and guided by the Canadian Coast Guard MCTS and U.S. Coast Guard VTS. Thus it can be concluded that the sailing route is well managed and has a high level of risk control in place.</p> <p>In the TERMPOL Review Process Report on the Trans Mountain Expansion Project, Transport Canada states, "The shipping route to and from Trans Mountain's terminal to the open sea is well established and used by deep sea tankers as well as other vessel types such as cargo vessels, cruise ships, and ferries."</p> <p>Furthermore, Transport Canada concludes in their report that the increase in large vessel transits per day is unlikely to pose a significant safety issue, especially considering the:</p> <ul style="list-style-type: none"> • characteristics of the shipping route; • current vessel traffic; • national, including international, regulatory frameworks governing safe navigation and collision avoidance; • comprehensive traffic routing measures, with traffic separation schemes; • Vessel Traffic Services; and |

TABLE A-1
TMEP Response to Wilderness Tourism Association of BC (WTABC) Comments

| WTABC Reference Number | WTABC Letter of Comment Content | TMEP Response |
|------------------------|--|--|
| 5.39 | <p>Within the Salish Sea (Strait of Georgia), navigational challenges may abate somewhat, however the concentration of nature based tourism amenities and businesses remains high. This is particularly the case for the eastern shoreline of Vancouver Island, Howe Sound, and the Sunshine Coast. These regions are highly dependent upon nature based tourism to provide income and employment.</p> | <ul style="list-style-type: none"> • mandatory pilotage, including additional requirements for oil tankers in the area. <p>References: <i>TERMPOL Review Committee. 2014. TERMPOL Review Process Report on the Trans Mountain Expansion Project. Ottawa, Ont. 57 pp.</i></p> <p>Additionally, in respect of the areas noted, there exists today established maritime industry activity, including the transiting of tankers and other large commercial vessels in and out of various ports of call in the region.</p> <p>There is a long history of marine transportation of crude oil and refined petroleum products within this region (over 100 years). Therefore, for most parts the transport risk factors associated with the Project already exist in the region. The safety regime in place today for both the existing tanker traffic and the operation of the Westridge Marine Terminal has been developed and continually improved since the terminal entered service in 1953. The regime is based on regulatory requirement, local experience and international best practices. It is comprehensive, well established and has proven to be effective.</p> <p>The increase in traffic resulting from the Trans Mountain tanker traffic (60 to 408 tankers per year – each sailing direction) is found to have a negligible effect on the total incident frequency in the region. With or without the Project, Trans Mountain tanker traffic remains a small part of total traffic in the region.</p> <p>In its concluding remarks, the TERMPOL Review Process Report on the Trans Mountain Expansion Project states,</p> <p>“The existing Canadian marine laws and regulations, including international frameworks, complemented by the enhanced safety measures Trans Mountain has in place or is committed to implementing and the recommendations contained within this report will provide for safer shipping in support of the proposed Project. Tankers and shipping operations, like any other vessel operations, will have to comply fully with national, including</p> |

TABLE A-1
TMEP Response to Wilderness Tourism Association of BC (WTABC) Comments

| WTABC Reference Number | WTABC Letter of Comment Content | TMEP Response |
|------------------------|---|--|
| | | <p>international, regulatory frameworks. Through Trans Mountain's oil tanker vetting and acceptance process, tanker operators will have to follow Trans Mountain's additional safety enhancements as committed to through the TERMPOL Review Process, which are designed to reduce the risks during operations."</p> <p>References: <i>TERMPOL Review Committee. 2014. TERMPOL Review Process Report on the Trans Mountain Expansion Project. Ottawa, Ont. 57 pp.</i></p> |
| 6.2 | <p>That the project applicant, Trans Mountain, be compelled to consult directly with the Wilderness Tourism Association to review the details of this Letter of Comment.</p> | <p>Trans Mountain welcomes the opportunity to meet directly with the WTABC and discuss their comments and concerns. To schedule a meeting with Trans Mountain, please contact</p> <p>Stephanie Snider Regional Specialist, Stakeholder Engagement 604.781.8389 Stephanie_snider@transmountain.com</p> |
| 6.3. | <p>That a condition of NEB approval of this project be the development of a comprehensive and public ESA that includes the identification of potential impacts on nature based tourism of the marine shipping component of the project, including but not limited to the potential risks identified in this Letter of Comment, and a comprehensive risk mitigation strategy related to the relevant risks identified.</p> | <p>After two years of consultation, In December 2013, Trans Mountain filed an eight-volume, 15,000-page Facilities Application, which contained the environmental socio-economic assessment. The preceding responses to WTABC's questions and comments provide precise direction on where potential project-related impacts to marine tourism are discussed. More generally, the following may be of interest to the WTABC:</p> <ul style="list-style-type: none"> • Volume 8B – Marine Commercial, Recreational and Tourism Use Technical Report (Filing ID A56022) • Volume 8C – TERMPOL 3.2 – Origin, Destination and Marine Traffic Volume Survey (Filing IDs A3S4R7, A3S4R8, A3S4R9) • Volume 8C – TERMPOL 3.15 – General Risk Analysis and Intended Methods of Reducing Risks (Filing IDs A3S5F4, A3S5F6, A3S5F8) <p>Section 1.5.3.1 of Volume 3A of the Application (Filing ID A3S0R3) describes</p> |

TABLE A-1
TMEP Response to Wilderness Tourism Association of BC (WTABC) Comments

| WTABC Reference Number | WTABC Letter of Comment Content | TMEP Response |
|------------------------|--|--|
| | | <p>a series of Environmental and Socio-economic Assessment (ESA) hosted by Trans Mountain. Regional marine ESA workshops provided information on the proposed approach to the completion of the Project marine ESA and sought input from stakeholders regarding study approach and methodology. The workshops also provided an opportunity for Trans Mountain to share information related to the other marine studies underway, including risk analysis, fate and effect testing, and preliminary dock design. Stakeholders in attendance included local and regional government representatives, naturalists and local stewardship groups, commercial and recreational fishery associations, tourism and recreational marine-based operators, commercial wharf operators, Aboriginal communities, and local and/or regional emergency managers.</p> <p>Regional marine ESA workshops, held in North Vancouver on May 22, 2013, and Langford on May 23, 2013.</p> |
| 6.4 | <p>The WTABC would also like to make an Information Request (IR) to receive all relevant documentation related to the “Environmental and Socio- economic Assessment: Human Activity & Land Use,” and any other relevant documentation related to impacts on marine- based tourism operators in British Columbia.</p> | <p>This material was filed with Trans Mountain’s Facilities Application. Please see Volume 8B – Marine Commercial, Recreational and Tourism Use Technical Report (Filing IDs A3S4K4, A3S4K5, and A3S4K6).</p> |
| 7.2 | <p>We urge the NEB to consider tourism and recreation values and interests as one of the primary areas of risk related to the project, and develop mandatory mitigation strategies to be put in place in the event that the project is authorized to proceed.</p> | <p>Trans Mountain appreciates the time and consideration taken by the WTABC in crafting this letter of comment. Over the last three years Trans Mountain and its consultants have conducted extensive engagement and communications activities to inform Aboriginal communities, stakeholders, the public and regulatory authorities about the approach to assessing potential environmental and socio-economic effects of the Project, and to seek input throughout the Project planning process.</p> <p>Upon review of the response provided herein, Trans Mountain believes that WTABC may reach different conclusions, with the additional reference material and corrected facts. Trans Mountain has as part of its Application and in the response discussed herein, considered tourism and recreation values and interests and is proposing a number of prevention and response</p> |

TABLE A-1
TMEP Response to Wilderness Tourism Association of BC (WTABC) Comments

| WTABC Reference Number | WTABC Letter of Comment Content | TMEP Response |
|------------------------|---------------------------------|---|
| | | <p>efforts to address these.</p> <p>As discussed in 6.2 above, Trans Mountain welcomes the opportunity to meet directly with the WTABC and discuss their comments and concerns. To schedule a meeting with Trans Mountain, please contact:</p> <p>Stephanie Snider Regional Specialist, Stakeholder Engagement 604.781.8389 Stephanie_snider@transmountain.com</p> |

Technical Report **TR-20**

Vancouver Fraser Port Authority Development Permit Application

Consultation Summary – Westridge Marine Terminal

Appendix K



TR-20

APPENDIX K

Emergency Management Stakeholder Workshop: Westridge Marine Terminal

Materials overview

| Municipalities, Park, other Stakeholders Data from GIS | Title | Name | |
|--|-----------------------|---|---|
| Port Coquitlam | | | |
| NOTE: Not an SE&C Community, but may have contacts due to Tri-Cities mutual aid | Emergency Manager | Emergency Program Officer | Tara Stroup |
| | Local Police/RCMP | Superintendent | Sean Maloney |
| | Fire Chief | Fire Chief | Nick Delmonico |
| | Environmental Manager | RCMP - Inspector | Bryon Massie |
| | | RCMP - Inspector | Jeff Metcalfe |
| Coquitlam | | | |
| | Emergency Manager | Regional Manager / Emergency Coordinator | Greg Kanya |
| | Local Police/RCMP | RCMP Emergency Planning, Auxiliary/Emergency Planning Coordinator | Darlene Kent |
| | Fire Chief | Fire Chief | Wade Pierlot |
| | Environmental Manager | Manager of Environmental Services | Vern Kucy |
| | | RCMP - NCO i/c Crime Reduction Unit | Sgt. Tony FARAHBAKHCHIAN |
| | | over seeing for Emergency Planning, Insp. Julie Drotar | Insp. Julie Drotar |
| | | Manager of Utility Programs | Dana Soong |
| | | Director, Public Works | Jamie Umpleby |
| Burnaby | | | |
| | Emergency Manager | Coordinator - Risk & Emergency Mangement | Charmaine Pflugrath |
| | Local Police/RCMP | Chief Superintendent, Officer in Charge | Dave Critchley |
| | Fire Chief | Fire Chief | Joe Robertson |
| | Environmental Manager | Environmental Manager | |
| City of Port Moody | | | |
| | Fire Chief | Fire Chief | Remo Faedo |
| | Environmental Manager | | Margot Davis |
| | Local Police/RCMP | Chief Constable | Brad Parker |
| District of North Vancouver | | | |
| | Emergency Manager | North Shore EMO, City of & District of NV & WV; Emergency Program Coordinator/Director, NSEMO | Mason, Dorit |
| | Local Police/RCMP | Superintendent | Chris Kennedy |
| | Fire Chief | Fire Chief | Victor Penman |
| | Environmental Manager | | Gavin Joyce, General Manager of Parks, Engineering and Facilities |
| West Vancouver | | | |
| | | North Shore EMO, City of & District of NV & WV; Emergency Program Coordinator/Director, NSEMO | Mason, Dorit |
| | Emergency Manager | | |
| | Local Police/RCMP | Inspector | Scott Findlay |
| | Fire Chief | Chief | Randy Heath |

| | | |
|-----------------------|--|--------------|
| Environmental Manager | Director of Engineering and Environmental Services | Raymond Fung |
|-----------------------|--|--------------|

City of North Vancouver

| | | |
|-----------------------|---|-------------------------------|
| Emergency Manager | North Shore EMO, City of & District of NV & WV; Emergency Program Coordinator/Director, NSEMO | Mason, Dorit |
| Local Police/RCMP | same as DNV | same as DNV |
| Fire Chief | Fire Chief Deputy Fire Chief | Dan Pistilli Bob Schreiner |
| Environmental Manager | Manager, Parks & Environment | Michael Hunter |

Village of Anmore

| | |
|--------------------|-------------------|
| Anmore, Village of | Milloy, Christine |
|--------------------|-------------------|

Village of Belcarra

| | | |
|-----------------------|--|--|
| Emergency Manager | Belcarra, Village of Chair, Protective Services and Emergency Preparedness Committee | Floyd, Lynda Counsellor Bruce Drake |
| Local Police/RCMP | | |
| Fire Chief | Fire Chief, Public Works Superintendent, Building Inspector | Larry Scott |
| Environmental Manager | | |

City of Vancouver

| | | |
|-----------------------|---|------------------------------------|
| Emergency Manager | Director of Emergency Management Manager, Emergency Planning | Stevens, Daniel Katie McPherson |
| Local Police/RCMP | Marine Unit cc Chief of Police | Sgt. Norm Webster Adam Palmer |
| Fire Chief | Fire Chief Deputy Fire Chief | John McKearney Mark Engler |
| Environmental Manager | Park Board General Manager (but City Manage | Malcolm Bromley |

RCMP "E" Division

| | |
|---|--------------------|
| Emergency Operations Manager, RCMP "E" Division Operational Readiness and Response | Sergeant Ron Casey |
|---|--------------------|

Port of Vancouver

| |
|---------------|
| Cindy Jeromin |
|---------------|

Simon Fraser University (SFU)

| | | |
|-----------------------|--|---------------------------------|
| Emergency Manager | Director Campus Security, Safety & Risk Services | Steve MacLean |
| Environmental Manager | Environmental Health & Safety Coordinator, Safety & Risk Services | Laura Barnette |
| Utility/Engineering | Development Planner, Campus Planning, Facilities Acting Senior Director Administration and Strategic Growth | Elizabeth Starr Chas Florio, |
| | Superintendent Buildings and Grounds, Facilities | Frank De Vita |

Vancouver Coastal Health

| | | |
|-------------------------------|------------------------|-------------------|
| Medical Health Officer | Dr. James Lu | |
| | Medical Health Officer | Dr. Mark Lysyshyn |

Fraser Health

| | | |
|-------------------------------|--|----------------|
| Medical Health Officer | Dr. Lisa Mu | |
| | Manager Health Protection, Burnaby /New We | Gordon Stewart |

Health Emergency Management BC (HEMBC)

| | |
|--|-------------------|
| Health Emergency Management BC - Exec. Director | John Lavery |
| Director HEMBC - Lower Mainland | Deirdre McLachlan |
| Manager of Environmental Health - Vancouver Coastal Health | Randy Ash |

FN Health Authority

| | |
|---|---------------------------------|
| Manager, Environmental Public Health Services, Community Health and Wellness Services, Policy Planning and Transformation | Linda Pillsworth |
| Manager, Drinking Water Safety, Community Health and Wellness Services | Sylvia Struck |
| FN Health Authority | Manager of Emergency Management |

First Nation Emergency Social Services (FNESS)

| | |
|--------------------|----------------|
| Executive Director | Brent Langlois |
|--------------------|----------------|

BC Ambulance Provincial EM Planning

| | |
|----------------------|---------------|
| BC Ambulance Service | Rene Bernklau |
| BC Ambulance Service | Rod Salem |

Metro Vancouver

| | |
|--|--------------|
| Manager of Safety, Security & Emergency Management | Rob Nicholls |
| Metro Vancouver, Director of Air Quality and Environment | Roger Quan |

EMBC

| | |
|--------------------------------------|------------------|
| EMBC, Integrated Public Safety (PLN) | Heather Lyle |
| EMBC, PEP (OPS) | Ian Cunnings |
| Emergency Management BC, IPS (PLN) | Shannon Peterson |

IPREM

| | |
|--------------------------------------|------------------|
| A/Director, Integrated Public Safety | Leslie MacDonald |
| IPREM Planning Coordinator | Clarence Lai |

MoE

| | |
|--|----------------|
| <i>Senior Environmental Emergency Response Officer</i> | Harold Riedler |
| Lower Mainland Region, BC Ministry of Environment, Environmental Emergency Program | |

Fire Chiefs' Association of BC (FCABC)

| | |
|---|--|
| President of FCABC - also Chief, Port Alberni Fi Tim Pley | |
|---|--|



Enhanced Emergency Management Program Engagement: Westridge

KMC Emergency Management Team
June 15, 2016



TRANSMOUNTAIN

CELEBRATING



YEARS OF SERVICE 1953 to 2013



Agenda

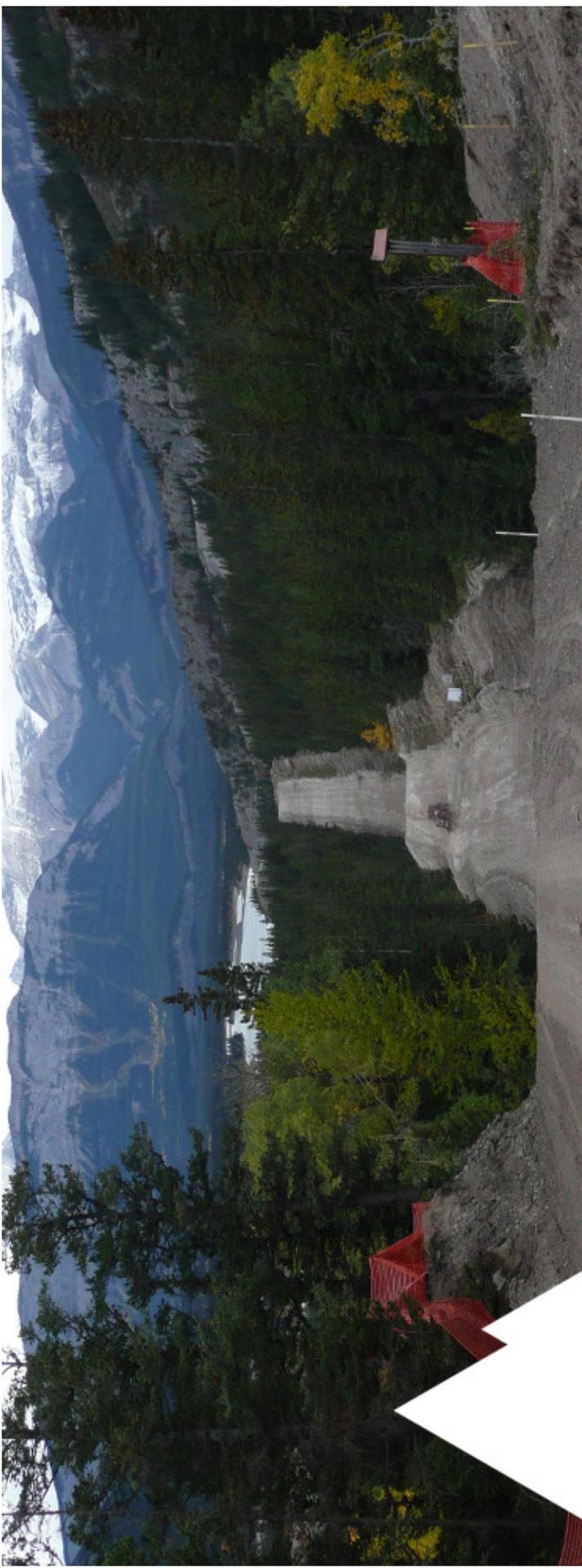
1. Trans Mountain Expansion Project
2. Emergency Management Engagement
3. Westridge Emergency Response Plan
 - *Breakout Session*
4. Fire Pre-Plan and Fire (Response) Plan
5. Supplemental Plans
 - *Breakout Session*

LUNCH



Agenda

8. Shut-down Procedures
9. Booming Strategy
10. Preparedness and Planning – KMC and WCMRC
 - Geographical Response Strategies
 - Spill Modelling
 - Equipment and Resources
11. Response Approach – KMC and WCMRC
 - Unified Command
 - Notification procedures
 - Co-ordination of KMC and WCMRC
12. Exercise & Training
 - *Breakout Session*



WORKSHOP PROCESS AND ETIQUETTE

Workshop Goals

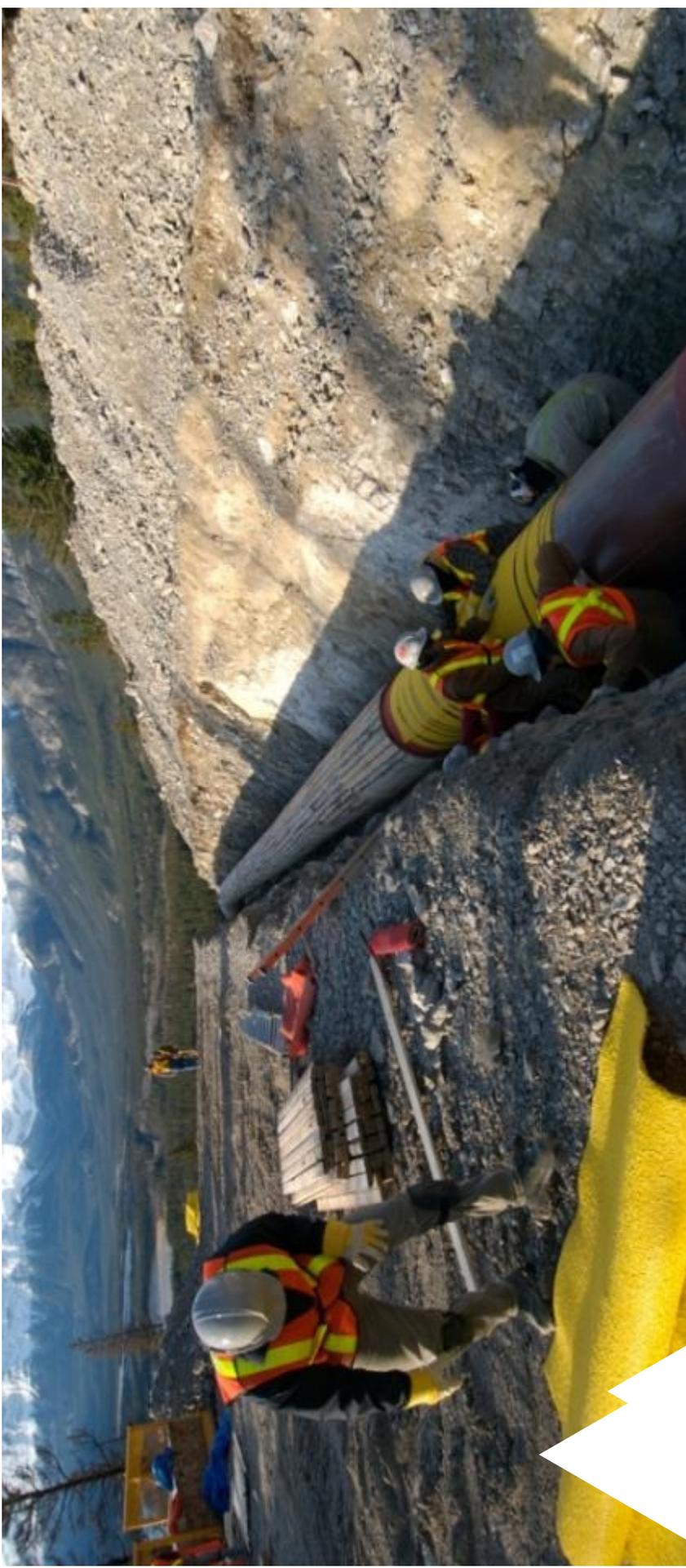
- To receive input for consideration on the enhancement of Kinder Morgan Canada's existing Emergency Management Program and:
 - Learn from local experience and knowledge
 - Understand concerns so they can be addressed
 - Inform our leading industry program
 - Maintain positive relationships with Aboriginal communities, stakeholders and local communities



Workshop Etiquette



- Participation in workshop will not be recorded nor will it be understood as endorsement of the proposed Project
- Where practical, feedback will be used to help inform Project plans
- A workshop summary will be prepared by Trans Mountain and shared with participants



TRANS MOUNTAIN EXPANSION PROJECT OVERVIEW

Trans Mountain Pipeline

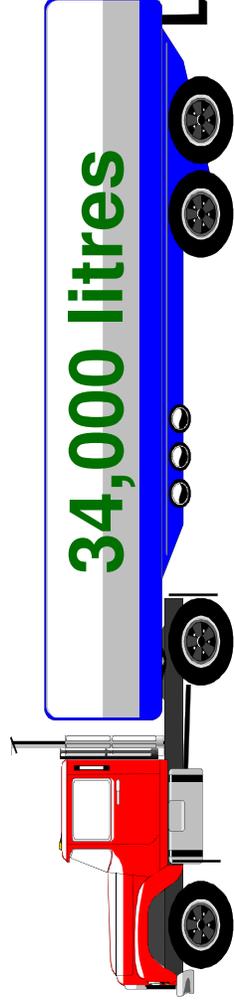


- 1,150-km pipeline between Strathcona County (near Edmonton) and Burnaby
- In operation since 1953, last expansion completed in 2008
- Regulated by the National Energy Board (NEB)
- Transports refined products, heavy crude oils, synthetic crude oils, light crude oils

Supply



- Current capacity 47.7 million litres or 300,000 barrels capacity per day



X 1,400

- Equivalent to a tanker truck leaving Edmonton for Vancouver every minute
- Ability to transport multiple products in batches up to 350 km long travelling at 5 km/hr:



Pipeline Safety

- Pipeline safety is our number one priority
- Project lifecycle approach – Design, Operations and Emergency Response
- Mature suite of programs in place to maximize pipeline safety
- EHS Policy – *“We are committed to responsible business practices and conducting our operations in an ethical manner”*
- Committed to improving pipeline and facility integrity to protect the safety of the public, the environment and our employees





**PROPOSED
TRANS MOUNTAIN EXPANSION PROJECT
CONFIGURATION MAP**

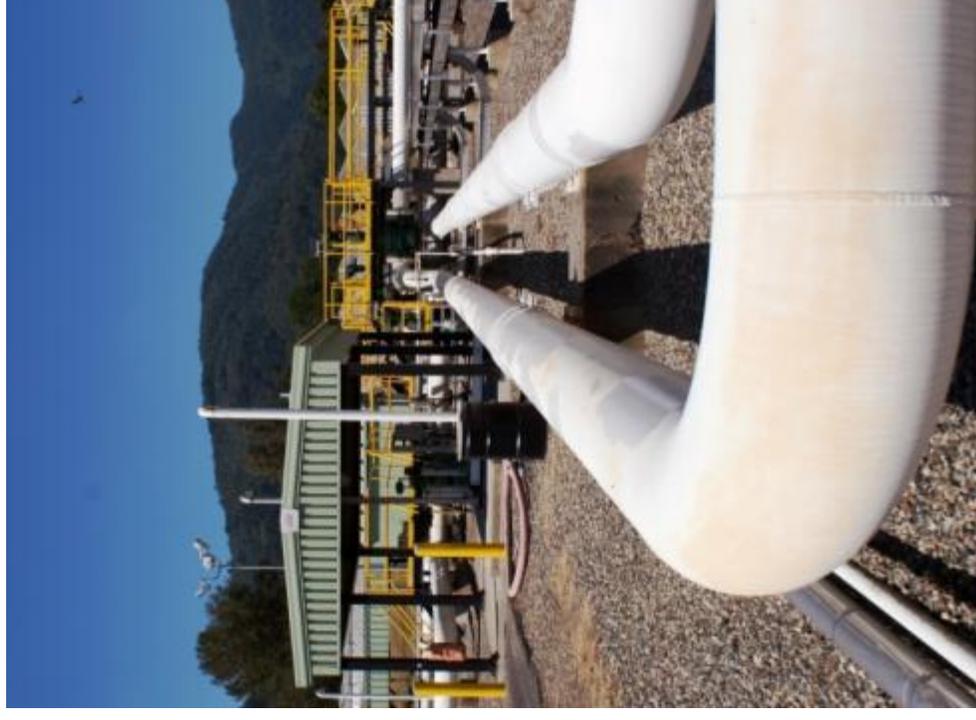
FEB 25 2015

- NEW PUMP STATION
- EXISTING PUMP STATION (DEACTIVATED)
- EXISTING PUMP STATION (EXPANDED)
- EXISTING PUMP STATION
- ADJACENTLY LOCATED PUMP STATIONS
- TERMINAL
- EXISTING PIPELINE -ACTIVE
- EXISTING PIPELINE -REACTIVATED
- NEW PIPELINE
- EXISTING PIPELINE -INACTIVE

Proposed Scope of Expansion Project



- Announced in 2012, Facilities Application filed to NEB in December 2013
- Based on 15- and 20-year commitments from shippers to use the line
- The proposed expansion to increase capacity to 890,000 barrels per day
- Projected capital cost is approximately \$6.8 billion*



*Actual Project costs may change.

Expansion Project Components

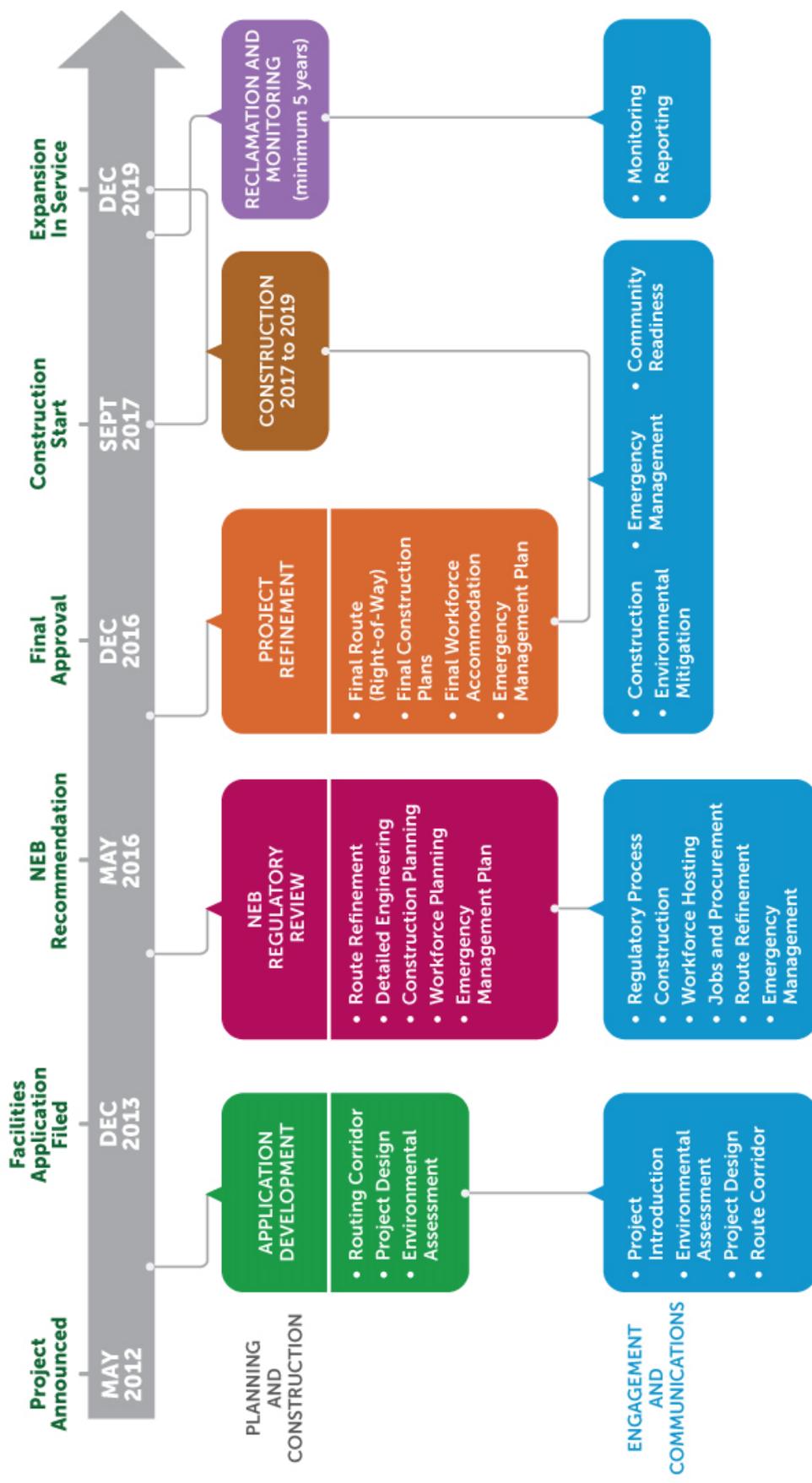


- Twinned pipeline system from Strathcona County to Burnaby
 - 980 km of new 36-inch (860 km) and 42-inch (120 km) diameter pipeline mostly parallel to existing pipeline
 - Line 1 – lighter products
 - Line 2 – heavier oils
 - Two new 30-inch diameter Burnaby to Westridge Delivery lines
- 12 new pump stations
- 19 new storage tanks
- Westridge Marine Terminal
 - New dock complex – three berth faces and a utility berth





Project Schedule



This schedule is subject to change based on detailed construction planning and regulatory timelines.

Current Status and Next Steps



- NEB recommendation –
May 19, 2016
- 157 Conditions
- Federal government decision
December 2016
- Anticipate construction start
in 2017
- Ongoing
 - Refinement of detailed engineering design and construction planning
 - Additional field studies underway along the proposed corridor
 - Engagement with landowners, Aboriginal groups, communities and stakeholders





EMERGENCY MANAGEMENT ENGAGEMENT PLAN

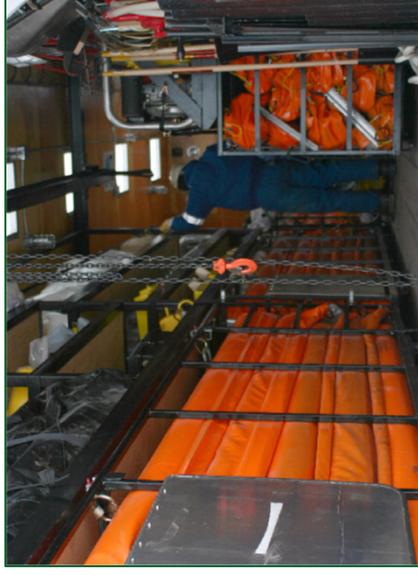
Emergency Management Objectives



- Build off the existing KMC Emergency Management Program (EMP)
- Develop and implement an industry-leading Emergency Management Program
 - Complies with applicable regulations and standards
 - Complies with NEB Conditions
 - Meets Government of BC's Five Conditions
 - Meets Trans Mountain's commitments to stakeholders and Aboriginal Groups

Engagement Process Goal

- Conduct an inclusive engagement with Aboriginal communities and stakeholders to receive specific and direct input and feedback for consideration for the enhancement of the Emergency Management Program (EMP)



Engagement Process

Why is participating in emergency management initiatives so important?

- Provides an opportunity for you to have direct input into the enhanced emergency response procedures specific to your community
- Provides opportunity to gather information on any high consequence areas within the area for protection
- Identifies concerns so they can be addressed
- Ensures a better understanding of emergency management for better communication in crisis situations
- Addresses any misconceptions around emergency spill response procedures
- Provides for an overall safer community
- Opens the doors for further dialogue on emergency management in the future

Key Topics

- Emergency Management Program
- Emergency Response Plans
- Exercises and Training
- Geographic Response Plans
- Fire Response Plans



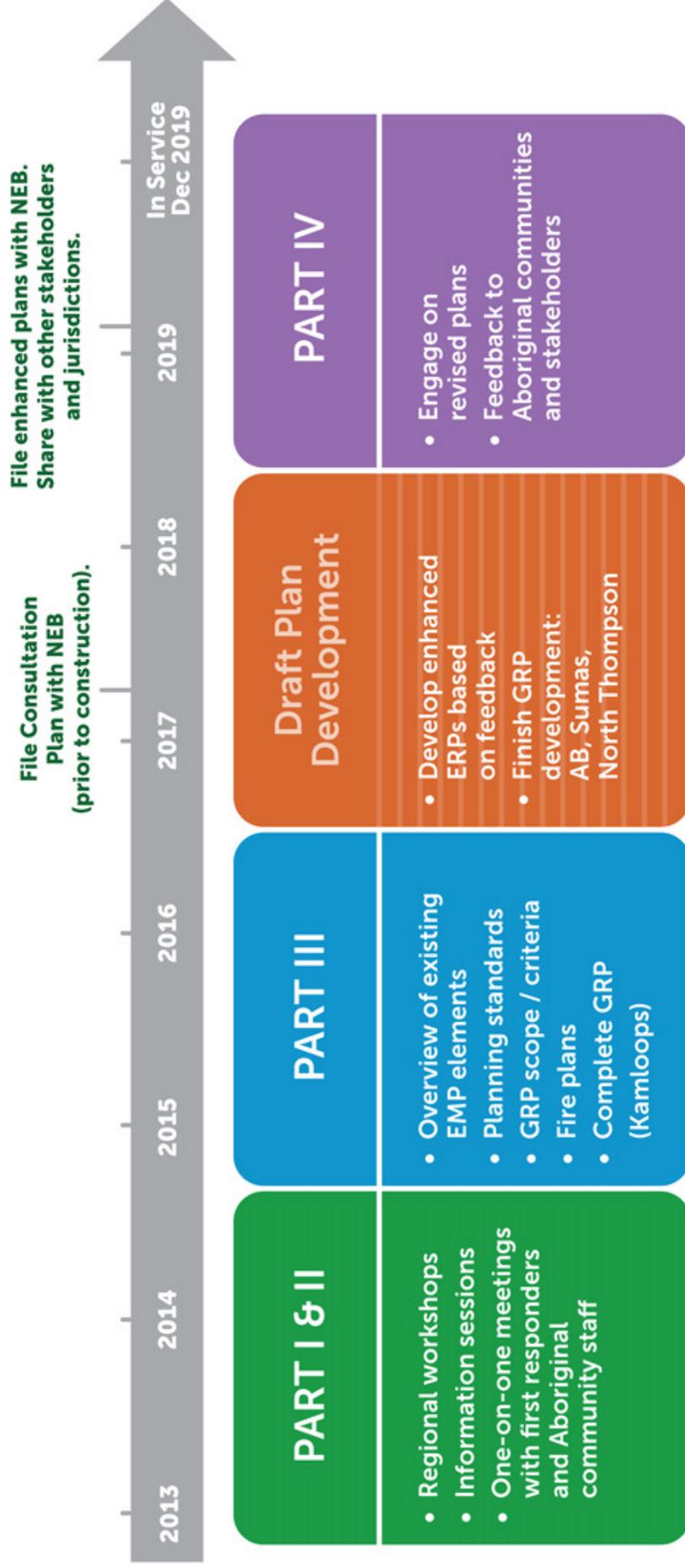
Enhancements Based on Feedback

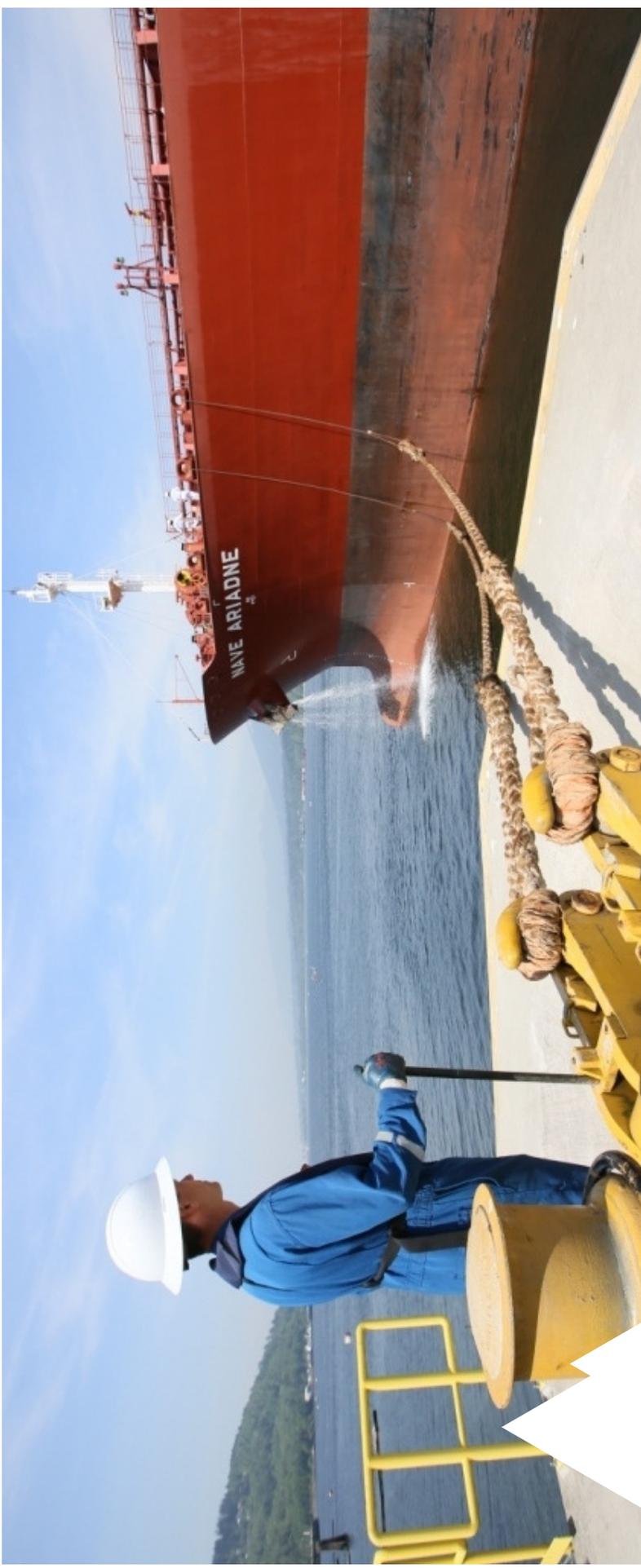


- Added supplemental emergency response equipment
- Created *Pipeline Emergency Response Guidelines for Schools*
- Formalized mutual aid agreement with Kamloops Fire & Rescue, and Burrard Inlet Industry partners
- *Developing Convergent Volunteer Management Plan*
- Established practice to hold ICS and Unified Command training prior to exercises
- Aboriginal identification of additional control points along pipeline and high consequence areas



Program Enhancement Timeline





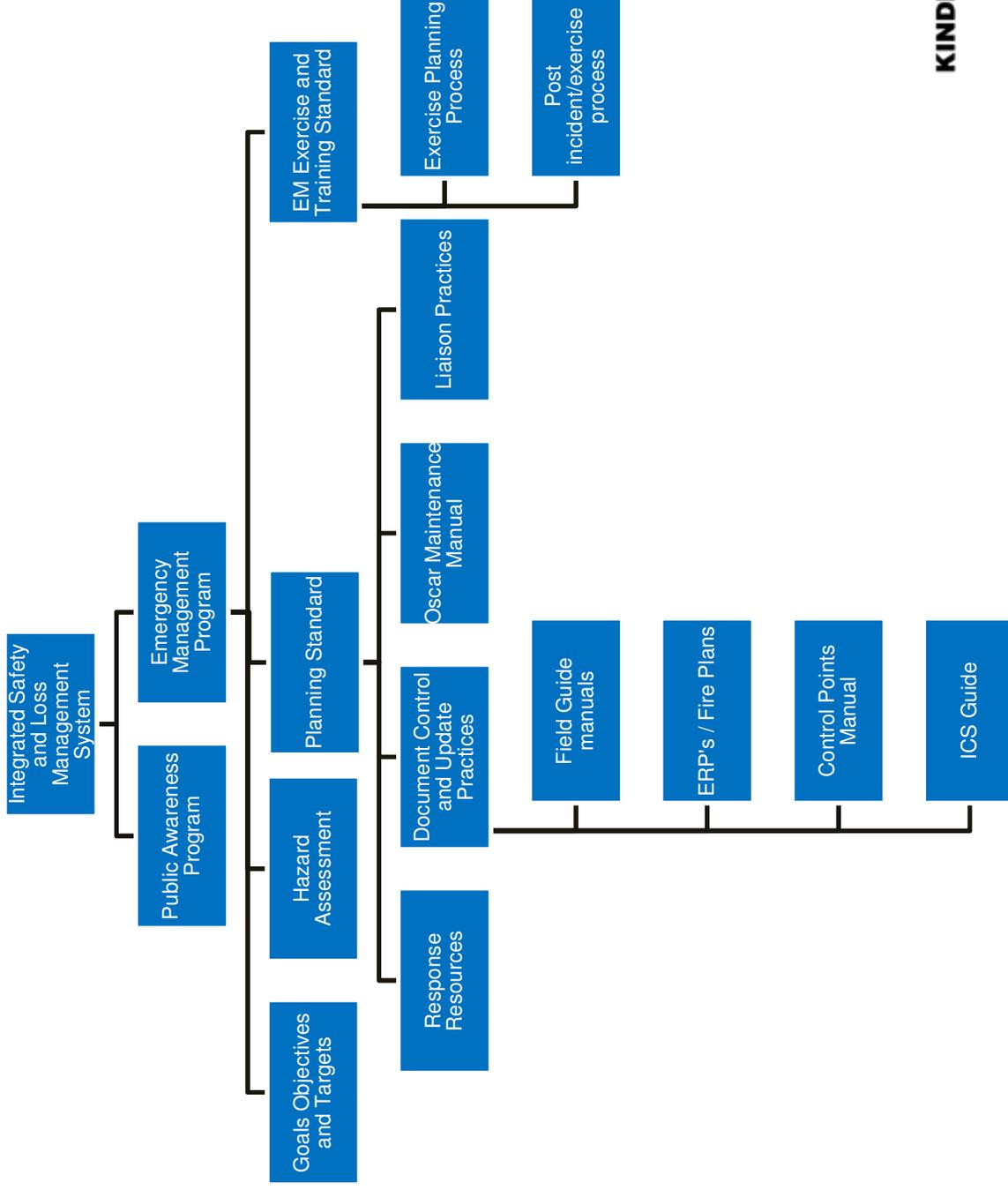
EMERGENCY RESPONSE PLAN

Emergency Management Program



- We have a robust Emergency Management Program in place today, which is required by the National Energy Board and complies with the regulations set out by the regulator
- It is part of KMC's Integrated Safety and Loss Management System (ISLMS)
- The most important aspect of preparedness is to prevent an emergency from occurring at all

Emergency Response Plans



Planning Standard



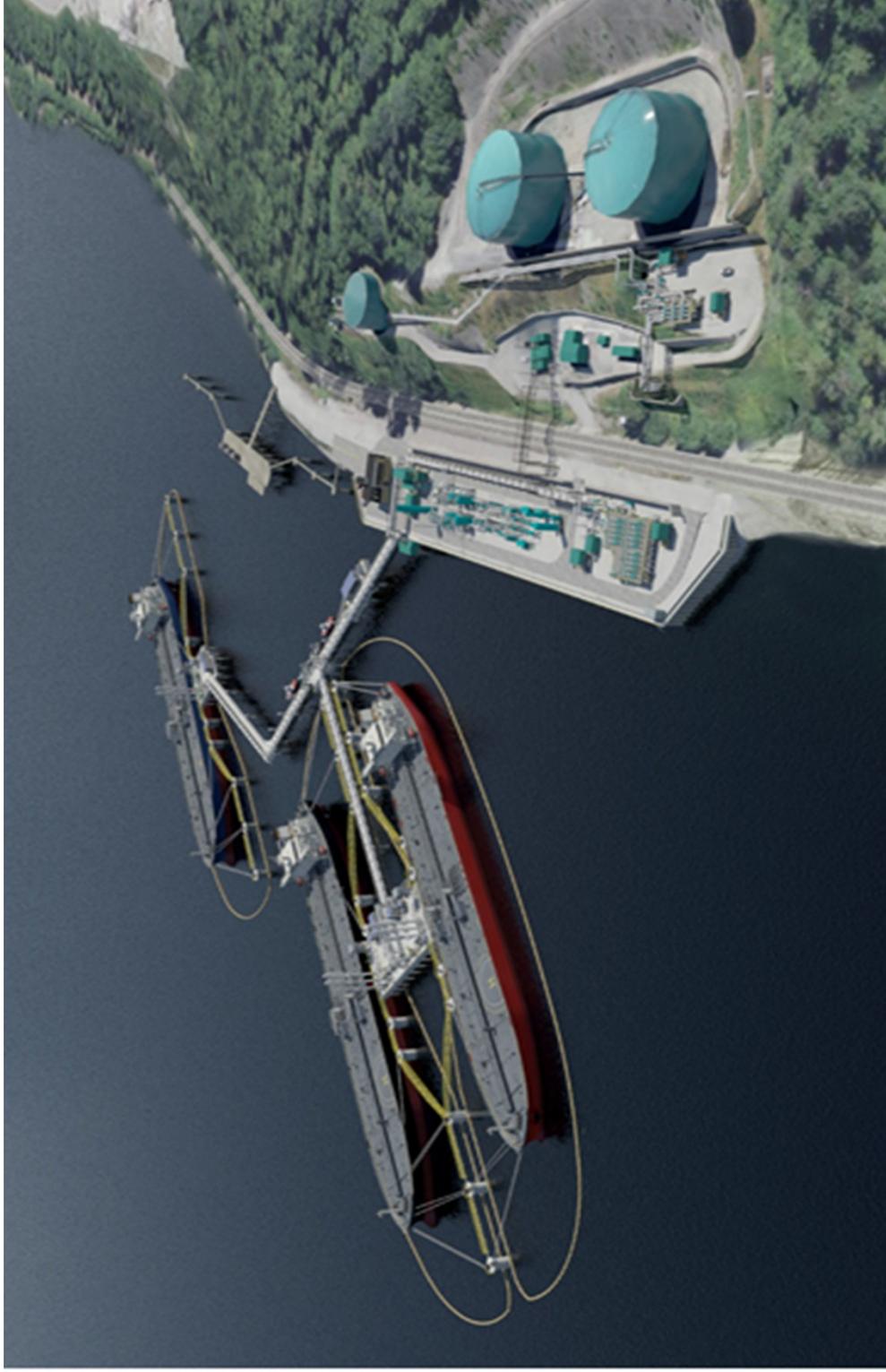
- It is a standard by which response planning can occur
- Fundamental document:
 - Defines terminology for use in the management system documentation
 - Uses hazard assessment processes already in place
 - Is based on credible worst-case scenario calculations
 - Determines the type, extent and location of response equipment and personnel based on response time

Emergency Response Plans



- KMC has a number of documents to help with the management of an incident including:
 - Emergency Response Plans
 - Fire Plans
 - Fire Pre-Plans
 - Incident Command System Guide
 - Numerous Job Aids
 - Crisis Communication Plan
 - Convergent Volunteer Plan
 - Air Monitoring Plan
 - Environmental Management Plans
 - WCMRC Geographical Response Strategies and Response Procedures

Westridge Marine Terminal Expansion





Westridge Marine Terminal: Regulation

- *National Energy Board (NEB) Act*
 - National Energy Board-regulated facility
 - *Onshore Pipeline Regulations*
 - Federal Incident Commander – NEB
- *Canada Shipping Act*
 - Transport Canada-regulated facility
 - Westridge Marine Terminal is classified as an Oil Handling Facility
 - Federal Incident Commander – Canadian Coast Guard

Regulatory Jurisdiction



| | Terminal (land based) | Dock (into water) | Ship within Boom |
|---------------------------------------|---|---|---|
| NEB | Regulator <i>Unified Command</i> | Regulator <i>Unified Command*</i> | Notified <i>Participate in ICP</i> |
| Transport Canada | Notified | Regulator | Regulator |
| Canada Coast Guard | Notified | Responder <i>Participate in ICP</i> | Responder <i>Unified Command</i> |
| Environment Canada | Regulator <i>Science Table</i> | Regulator <i>Science Table</i> | Regulator <i>Science Table</i> |
| BC Ministry of Environment | Regulator <i>Unified Command Science Table</i> | Regulator <i>Unified Command Science Table</i> | Regulator <i>Unified Command Science Table</i> |

*NEB represents the Federal Family in Unified Command



Westridge Emergency Response Plan



Emergency Actions

- 1 Responder Health & Safety
- 2 Notifications
- 3 Spill and Site Assessment
- 4 Spill Containment & Recovery
- 5 Protection of Sensitive Areas
- 6 Multiple Hazards



Support Information

- 7 Site Information
- 8 Incident Management
- 9 Operations
- 10 Planning
- 11 Logistics
- 12 Finance/Administration
- 13 Wildlife Care
- 14 MSDS



Regulatory Information

- 15 Environmental Policy
- 16 Regulatory Background
- 17 Training and Exercises

Break Out Session #1



Three Breakout Groups

Time allocated: 30 minutes

Topic: EM Plan and Potential Integration

Questions for each group:

1. What information is in your ERP relating specifically to a Westridge Terminal incident?
2. What are the public safety and/or environmental protection measures in your plan that can be applied to a terminal incident? (eg. All-Hazards, HAZMATt)?
3. What can KMC provide (information/materials) that would help support/strengthen your plans?

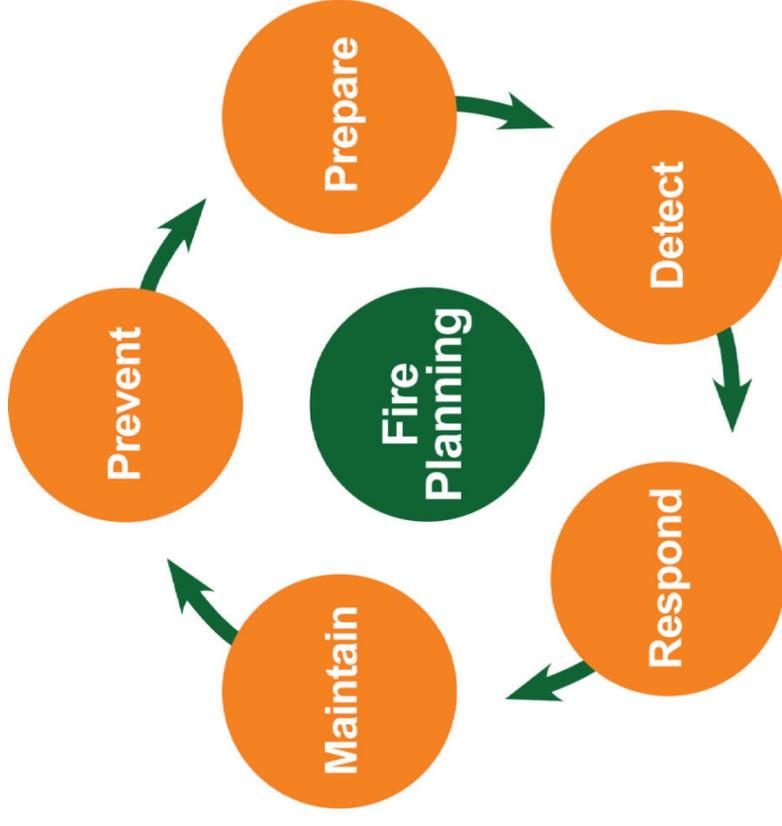


FIRE PLANNING

Facilities Design Safety Considerations



- Facilities designed and operated to prevent fires, however, should they occur, early detection systems are in place
 - Industry Best Practices
 - Engineer controls
 - Operational procedures
 - Maintenance practices
 - Relevant Codes
 - API Standards
 - NFPA Standards



Fire Safety Plans



- Fire safety plans and evacuation plans are compliant with provincial and national fire codes
- Plans include site and building drawings with:
 - Evacuation routes
 - Muster points
 - Response and safety equipment (e.g., fire extinguishers)
- Plans designate response positions and duties

Fire Pre-Planning

- Site-specific plans for facilities that have active liquid hydrocarbon storage tanks or loading and unloading facility
- Pre-plans include:
 - Notification procedures
 - Equipment
 - Site drawings and photos
 - Tank-specific data
 - Spill response data
 - Size
 - Fire suppression requirements
 - Exposures
 - Drainage
 - Tactical response guidelines and procedures
 - Potential hazards associated with fire incidents



Incident Prevention



Permits/Plans

- Safety standards manual
- Safe work permit
- Hot work permit
- Confined space permit
- Job Hazard Assessment (JHA)
- Tailgate meeting
- Confined space rescue plan
- Fire safety plan

Response Capability

- Site staffed 24/7 during ship-loading operations
- CCTV cameras along dock
- Fixed gas detection in high hazard areas
- Fixed remote control foam turrets at each dock designed for a minimum of 30 minutes foam suppression for containment area
- Unlimited water supply for firewater pumps
- Large volume foam concentrate on-site as well as backup at Burnaby Terminal
- Backup portable foam bladder trailer

Fire Equipment Enhancements



- Two large volume firewater pumps installed along shoreline (supplied by inlet)
- Two large volume foam concentrate pumps including large concentrate storage tank
- Numerous hi-volume manifolds installed along shoreline
- Remote controlled fixed foam turrets at each dock (minimum two per dock)
- Cooling lines along dock
- Numerous 300-lb dry chemical wheeled extinguishers for three-dimensional fires

Fire Response & Protection Equipment

- Fixed foam discharge
- Remote operation
 - Vapour suppression
 - Fire suppression



Fire Response & Protection Equipment



Foam Bladder Trailer



Foam Cannon Turret



Fire Response & Protection Equipment



Foam Cannon



Hose Trailer



Westridge Dock System (Proposed)



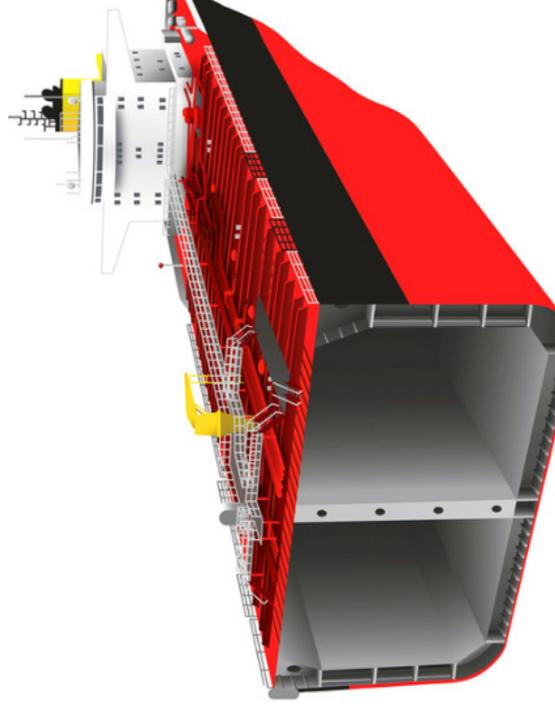
Vessel Fires



- Regulations require all vessels to be designed, constructed, equipped and operated safely
- Staff onboard are trained to handle emergencies, including shipboard fire
- Conventions, Codes and Standards:
 - International Convention for the Safety of Life at Sea (SOLAS)
 - International Code for Fire Safety Systems (FSS)
 - International Code for Application of Fire Test Procedures (FTP)
 - International Safety Management Code (ISM)
 - International Convention on Standards for Training, Certification and Watchkeeping for Seafarers (STCW)

Tanker Fires

- All vessels utilize:
 - Structural fire protection
 - Fire alarm and detection
 - Fixed and portable fire suppression systems
- On tankers:
 - Cargo tanks are kept inerted, i.e., reduced oxygen content in tanks
 - Ignition sources are removed
 - 24/7 gas detection, fire/smoke alarms
 - Water and foam system
 - Fixed firefighting system, e.g., CO₂, HE foam
- Best Practice:
 - OCIMF Recommendations
 - KMC Tanker Acceptance Standard (Westridge)
 - Vapour collection during loading (Westridge)

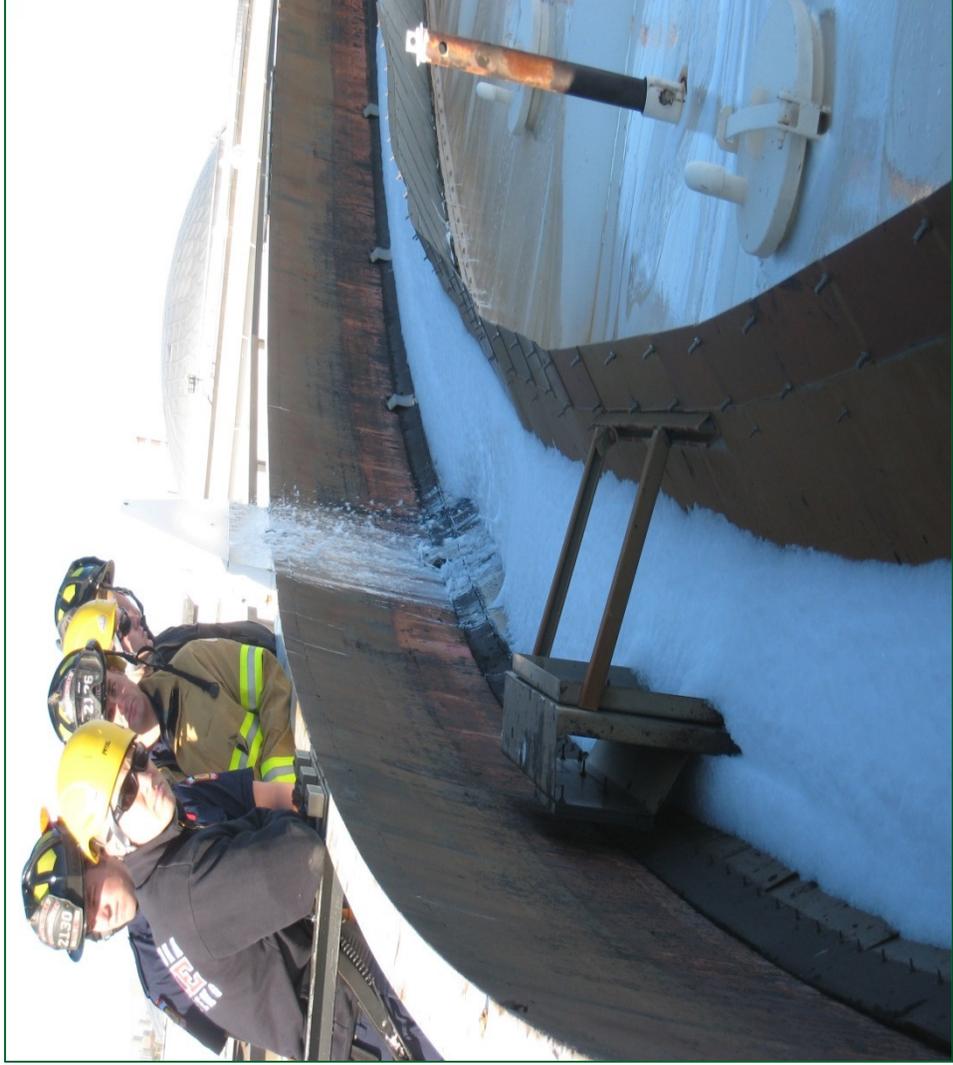


Fire on Vessel at Westridge



- Should a fire occur on a vessel at Westridge:
 - Vessel crew will act according to the vessel's emergency plan and apply appropriate firefighting equipment/methods
 - Westridge emergency plan will be activated:
 - Notifications will be made
 - Product transfer will cease
 - Loading Master will co-ordinate between vessel and terminal
 - Dock fire suppression system is designed to protect the facility and support the vessel with water and foam monitors
 - Tugs with high capacity firefighting equipment are available
 - Vancouver Fraser Port Authority Fire Response has access to VFD fire-boats and firefighters trained to fight shipboard fires

First Responder Training



Mutual Aid

- KMC resources available for mutual aid
 - Industrial incident response
 - Fire response
 - Environmental response – land or water
 - Decontamination
- Burrard Industrial Mutual Aid Agreement
 - Reciprocal emergency response agreement between Shell, Imperial Suncor and KMC
 - Identified resources and response capacity to support one another in an incident
- Other Mutual Aid Agreements
 - City of Kamloops
 - Canadian Energy Pipeline Association (CEPA) Mutual Emergency Assistance Agreement

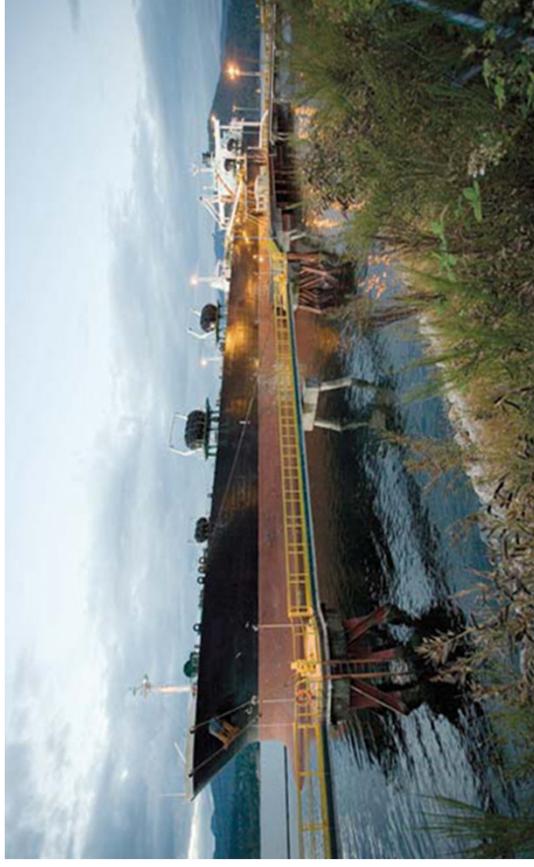


Air Quality Monitoring Plan

Emergency Air Monitoring Plan



- Objectives of plan
 - Anticipate and identify Potential Chemicals of Concern (PCOC) hazards from unplanned releases and fires
 - Evaluate public health exposures
 - Protect public through specific air monitoring and response protocols



Emergency Air Monitoring Plan



- Roles and Responsibilities
- Potential Chemicals of Concern (PCOC)
 - Applicable criteria and response
- Sample strategy
 - Pre-planning
 - Sampling strategy
 - Monitoring equipment
 - Field data

Emergency Air Monitoring Plan



Incident Response – Air Monitoring

- Action Level
 - Pre-identified criteria levels
 - Pre-identified sensitive receptors (vulnerable populations)
- Notify Unified Command & Liaison
 - Data shared and provide technical advice to local authorities
 - Authority determines appropriate public safety actions

Emergency Air Monitoring Plan

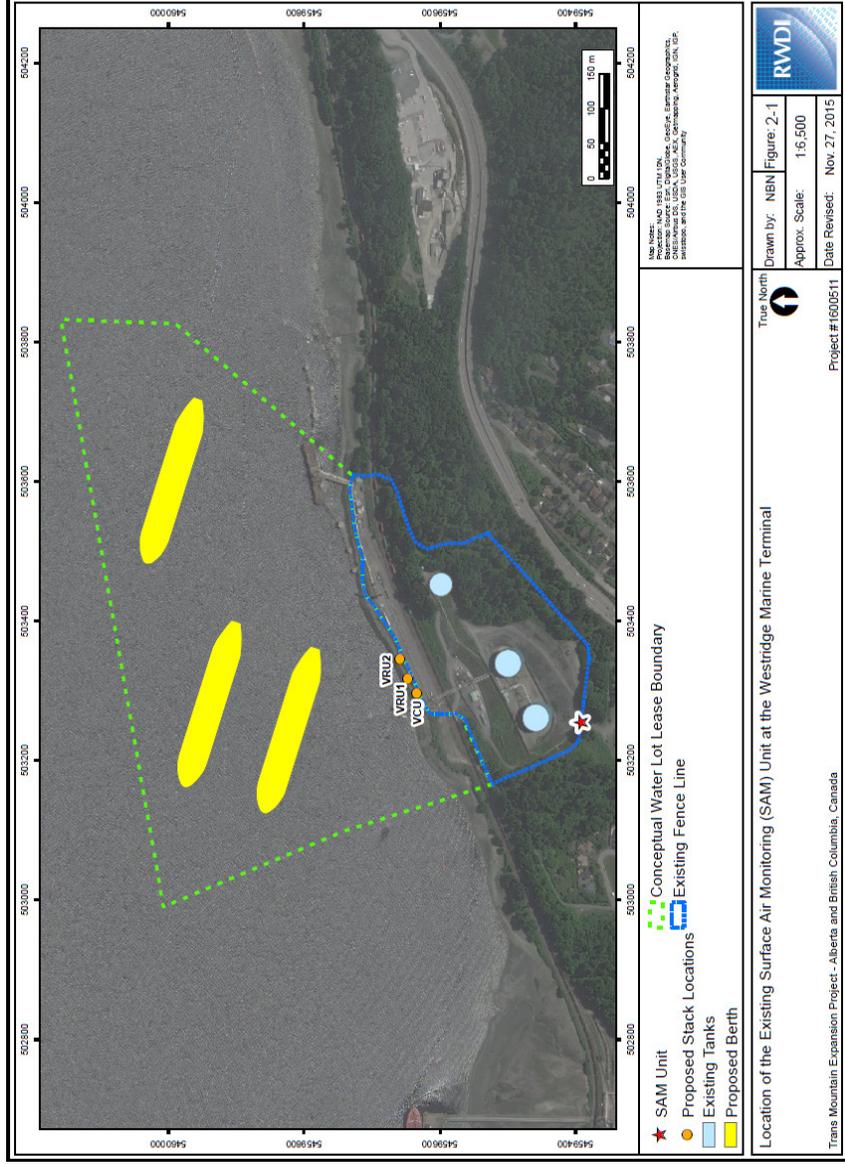


Response Actions

- Real-time monitoring of immediate public safety hazards to provide data for assessment and action
1. Notified of incident
 2. Reading from equipment on-site
 3. Mobilize supplemental resources – regional mobile units
 4. Request advanced and long-term monitoring supplemental resources
 5. Populate Environmental Unit in Planning Section of ICP
 6. Generate sampling strategy for air quality monitoring
 7. Consult with regulatory agencies and authorities on public safety measures

Note - activities are taking place simultaneously

Automated Monitoring Station (SAM)



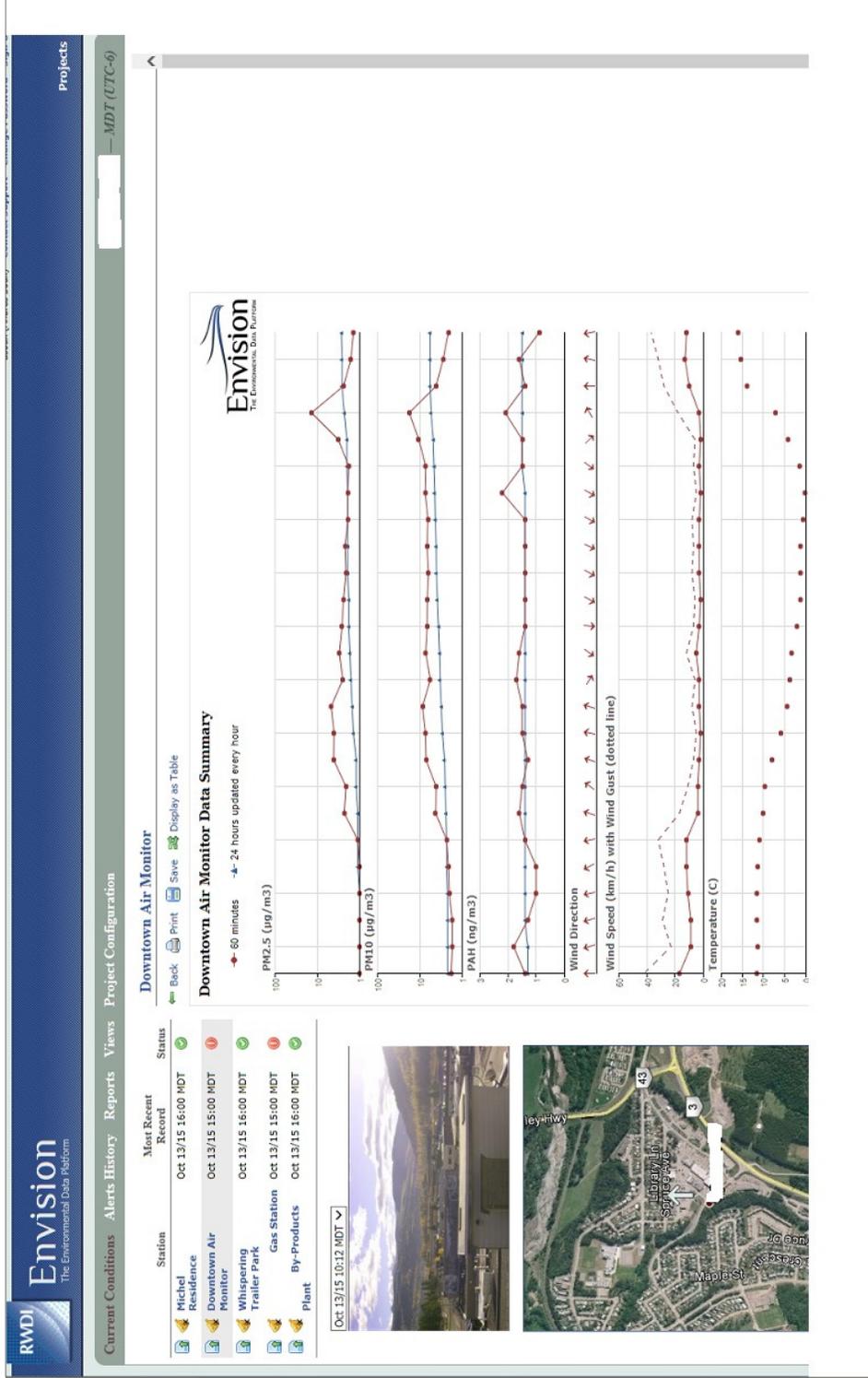
Air Quality Station: Real Time Data



Air Quality Station



Air Quality Station: Real-Time Data





Wildlife Management Plan

Wildlife Management Plan



- Wildlife management strategies vary greatly from incident to incident
 - Marine or freshwater
 - Season – breeding, migration
 - Type of terrain
 - Type of vegetation
- Incident-specific action plans will be developed for each of the three components of the Wildlife Management Plan

Wildlife Management Plan



- Comprised of three components
 - Wildlife Monitoring
 - Wildlife Recovery and Rehabilitation
 - Wildlife Deterrents



Wildlife Management Plan



Wildlife Monitoring

- Purpose:
 - To identify ongoing and potential impacts to wildlife and identify appropriate mitigations
- Identifies potential species and species at risk within the impacted area
- Outlines monitoring/surveillance strategies for the impacted area and any other potentially affected areas

Wildlife Management Plan



Wildlife Monitoring

- Describes potential mitigation measures for identified risks to wildlife
 - Wildlife sweeps ahead of response activities
 - Amphibian salvage for populations at risk of oiling
 - Setback buffers around birds nests that are in use

Wildlife Management Plan



Wildlife Monitoring

- Data collected from the monitoring activities is used to develop appropriate Wildlife Recovery and Rehabilitation & Wildlife Deterrents Plans

Wildlife Management Plan



Wildlife Recovery and Rehabilitation

- Purpose:
 - To determine and implement the appropriate actions regarding the active handling of impacted wildlife
- Identifies regulatory requirements and permits required for wildlife capture and handling

Wildlife Management Plan



- Wildlife Recovery and Rehabilitation
 - Outlines the wildlife capture, transport, rehabilitation and release processes
 - Addresses requirements for wildlife care centres

Wildlife Management Plan



Wildlife Deterrents

- Purpose:
 - To determine and implement the appropriate deterrent technologies and techniques
- Identifies regulatory requirements required for wildlife deterrence activities
- Provides guidance on deterrence considerations to ensure effective implementation of mitigation strategies
- Identifies deterrence methods and strategies specific to the site and species

Wildlife Management Plan



Wildlife Deterrents

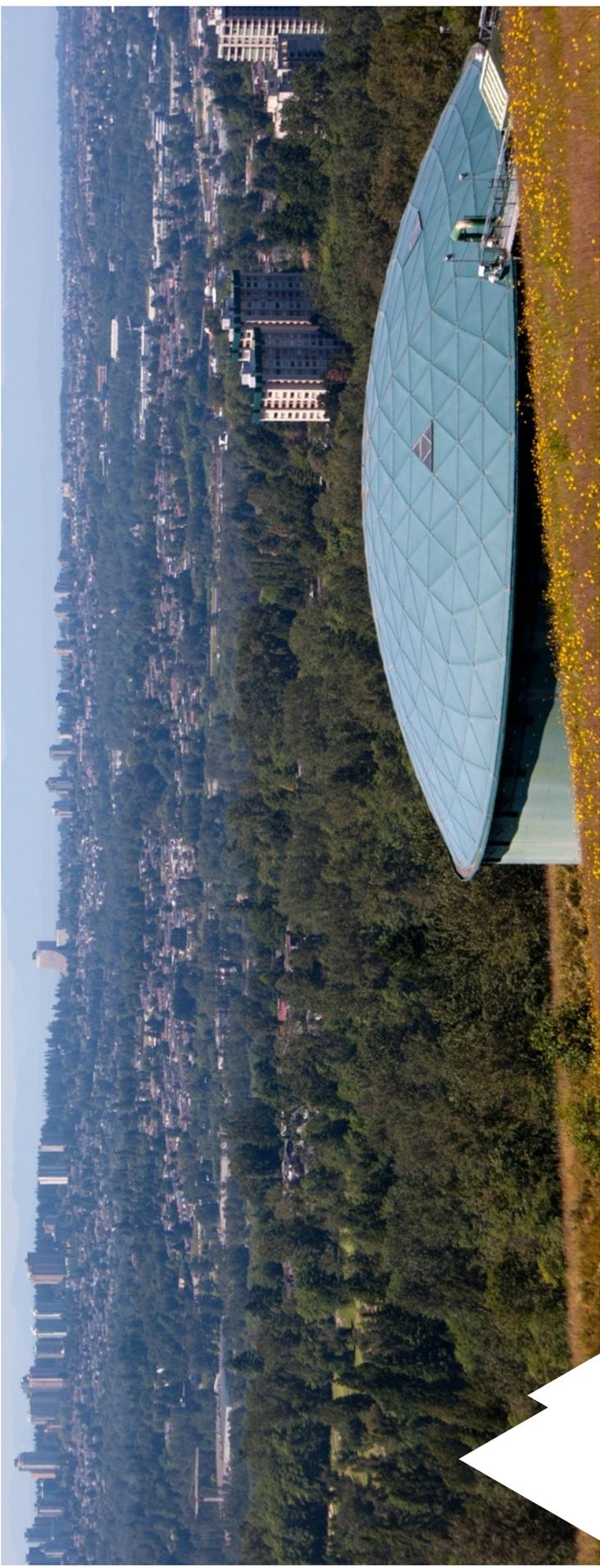


Wildlife Management Plan



Wildlife Management Team

- Kinder Morgan Canada
 - Overall responsibility for wildlife management in an emergency
 - Fills ICS role of Environmental Unit Lead
- Golder Associates
 - Responsible for wildlife monitoring and mitigation during response activities
- Focus Wildlife
 - Responsible for wildlife capture, care, deterrence and rehabilitation

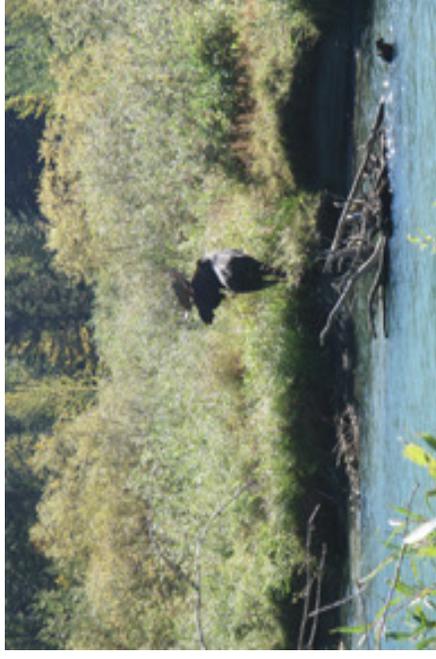


Convergent Volunteer Management Plan

Convergent Volunteer Management



- What are “Convergent Volunteers?”
- Why do we need a plan to manage Convergent Volunteers?



Convergent Volunteer Management



- KMC Convergent Volunteer Management Plan
 - Establishes procedures to allow for well-organized, coordinated , and safe, use of volunteers
 - Provides for the direction of volunteers
 - Identifies specific areas in which volunteers can safely be used
- Plan tested during 2015 Westridge Exercise and 2016 Kamloops Exercise

Convergent Volunteer Management



- Plan enhancements underway
 - Research and consultation
 - Fortify strategies to manage convergent volunteers
 - Volunteer Operations Centre (VOC)
 - Volunteer Resources
 - Communication
 - Orientation and Training



Break Out Session #2

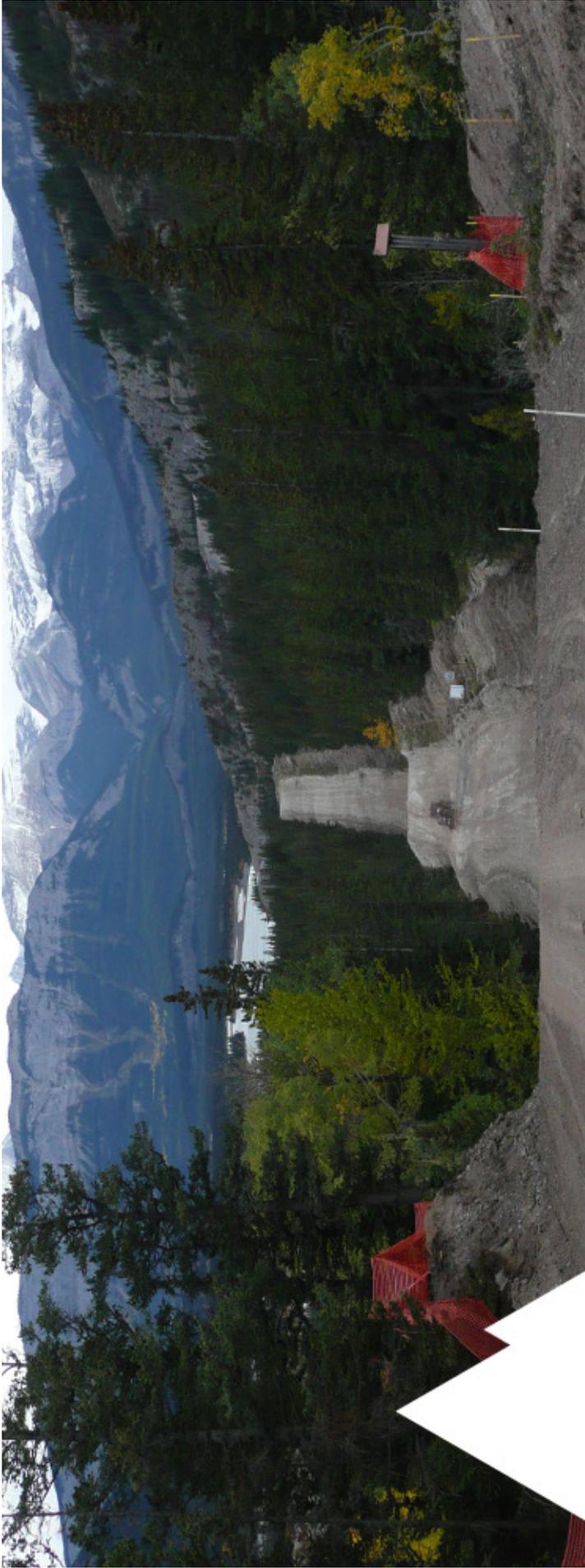


Four Breakout Groups

Topic: Supplemental Plans

- Will rotate through the four stations to discuss:
 1. Fire Pre-Plans and Fire Response Plans
 2. Air Quality Monitoring Plan
 3. Wildlife Management Plan
 4. Convergent Volunteer Management Plan

Time allocated: 40 minutes



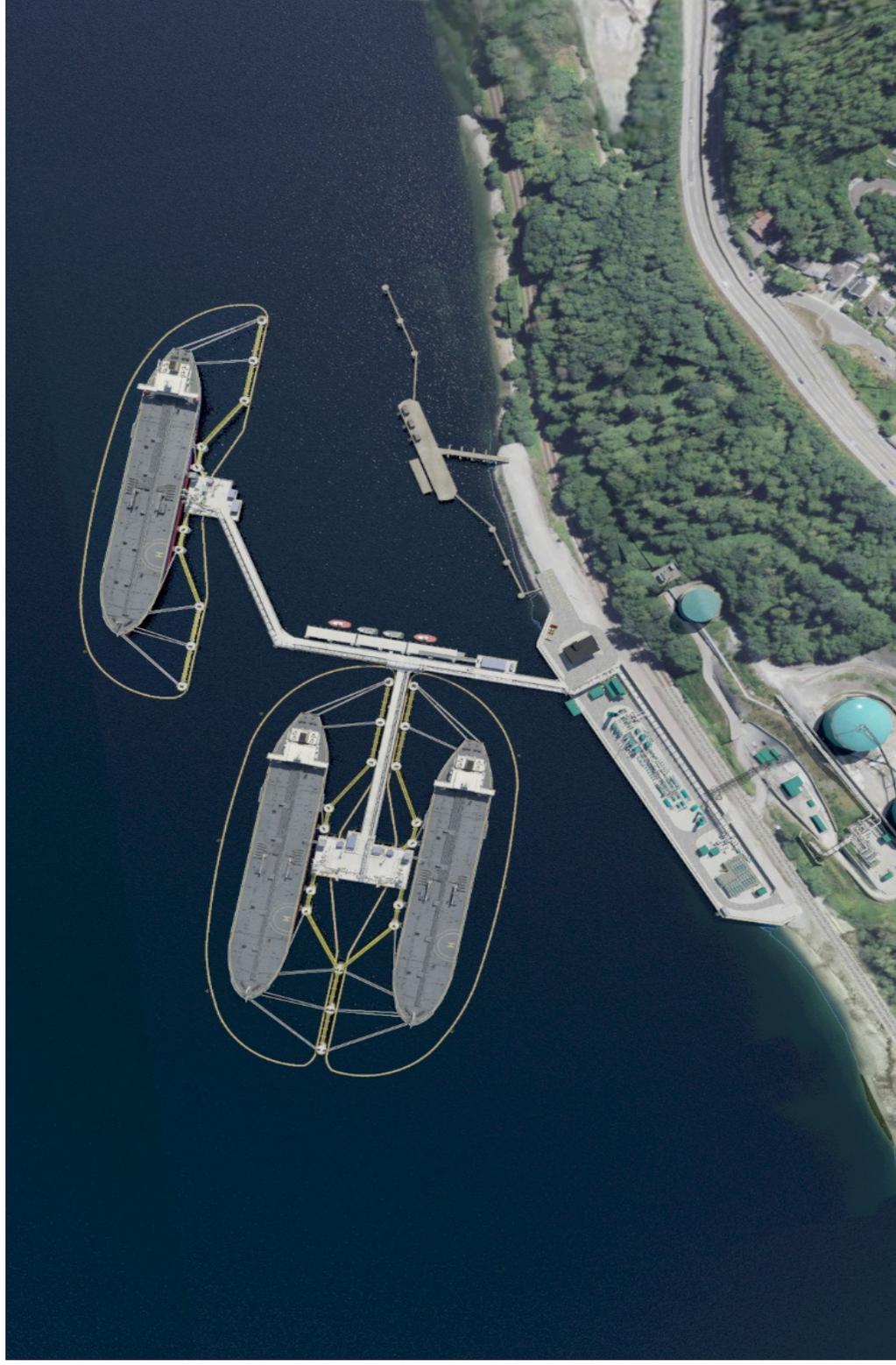
LUNCH

Containment Booms



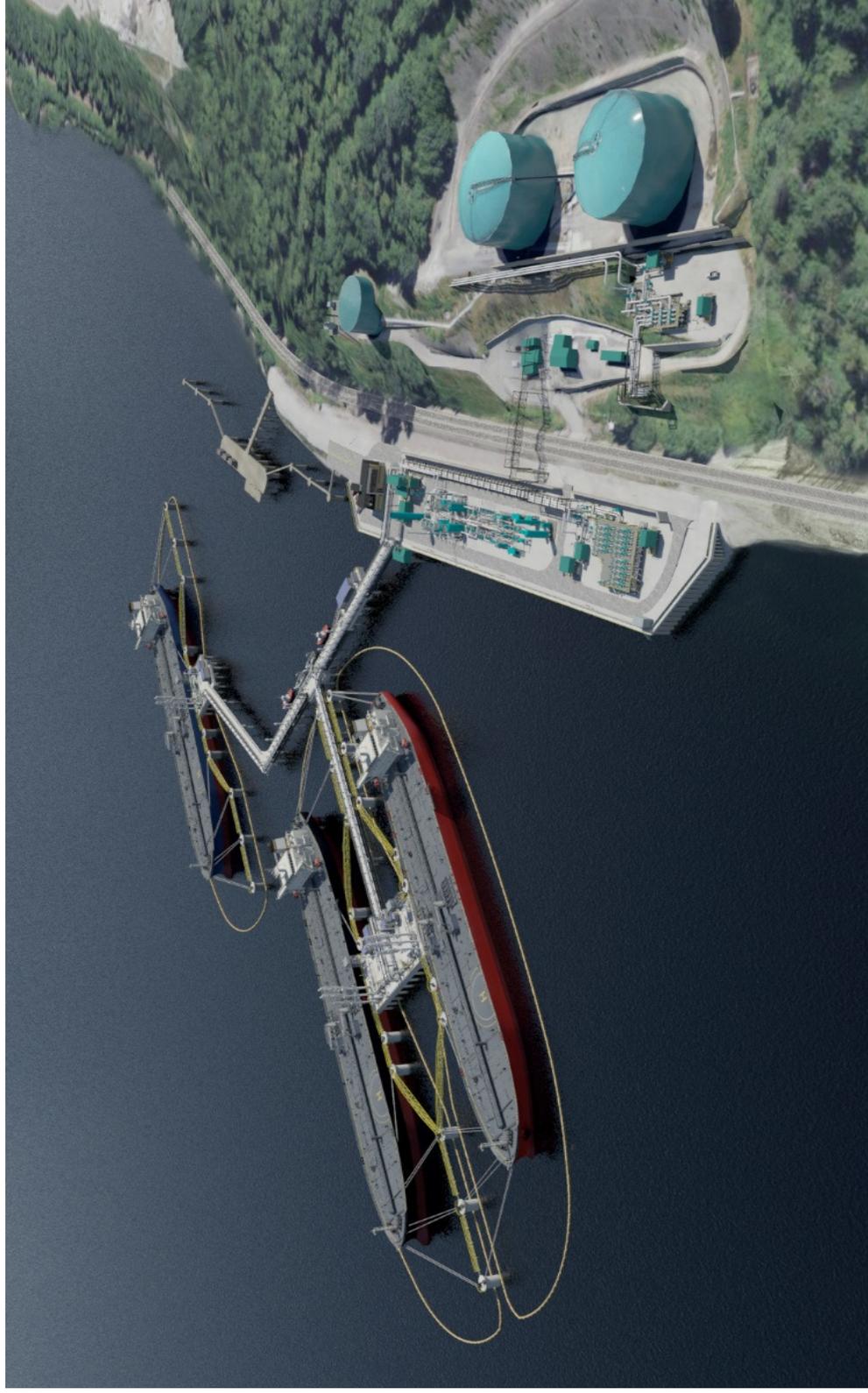
- At Westridge, KMC uses two types of oil spill containment booms
- Primary Boom
 - Non-regulatory KMC standard operations procedure as a preventive and mitigation practice
 - Considered best practice
 - Deployed for every vessel during the entire product transfer period
 - Will contain oil in the unlikely event of a spill and help to protect the environment
- Emergency Response Boom
 - Regulatory requirement of *Canada Shipping Act*
 - Required to deploy boom within one hour of a release

Primary Boom Deployment



**Proposed*

Primary Boom Deployment



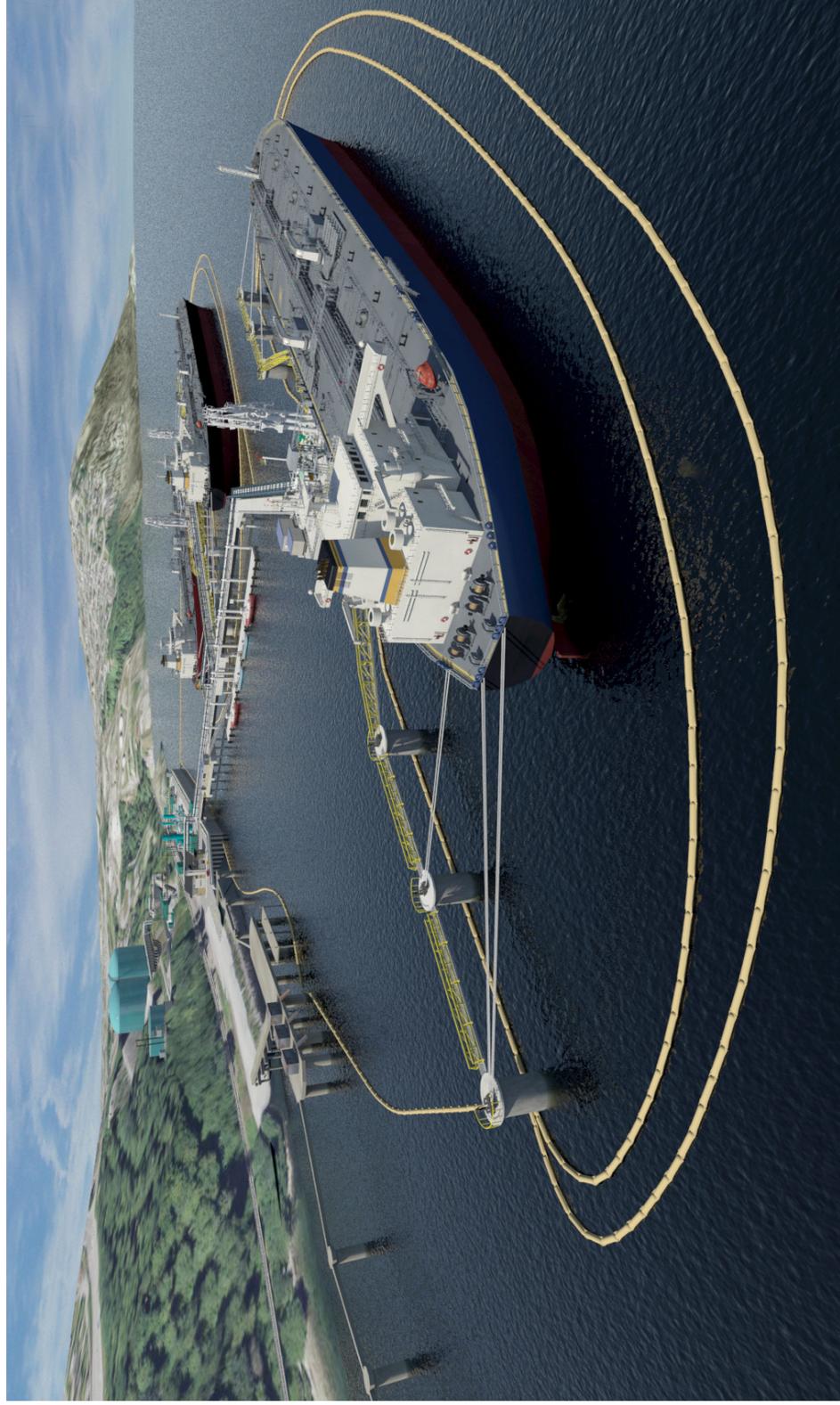
*Proposed

Emergency Response Deployment



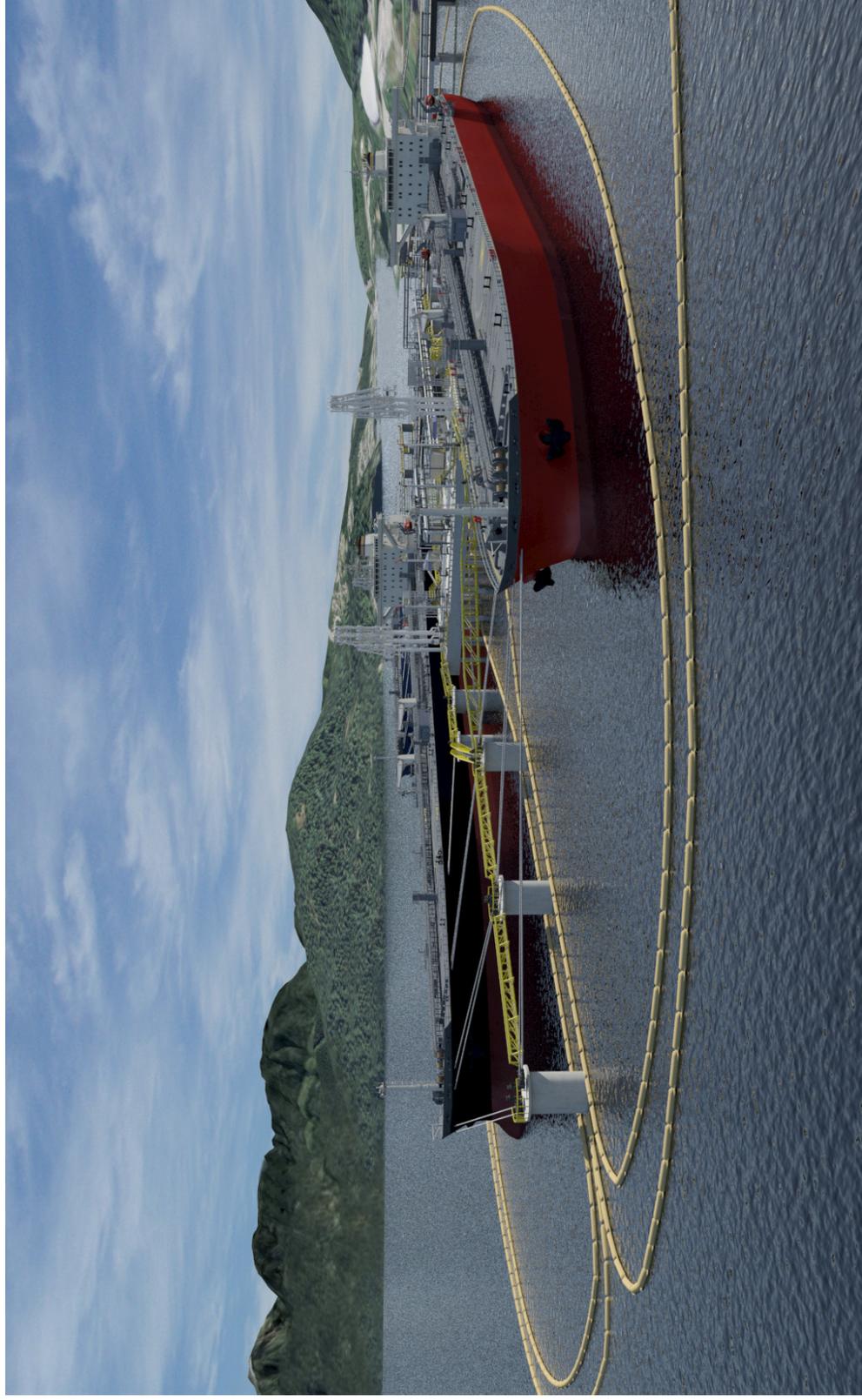
**Proposed*

Emergency Response Deployment



**Proposed*

Emergency Response Deployment



*Proposed