

2015 Marathassa Spill, Burrard Inlet

2021 Update— 2016 Tsleil-Waututh Oil Spill Response Plan and Preparedness Assessment

For:



Tsleil-Waututh Nation
PEOPLE OF THE INLET

By:



TWN Promulgation

This 2021 Update of the 2016 *Oil Spill Response Plan and Preparedness Assessment* is issued by the Tsleil-Waututh Nation Chief and Council as part of our commitment to protect, defend, and steward the water, land, air, and resources of our territory. It is the product of collaboration between our government, our community, and invited technical experts. Its implementation puts Tsleil-Waututh governance rights into action reinforcing our commitment to restore conditions that provide the environmental, cultural, spiritual, and economic foundation for our Nation to thrive.

We expect our government and industry response partners to recognize, respect, and abide by this Plan and Update in each of their planning processes. Thereby, Chief and Council direct that the 2016 OSRP and 2021 Update be distributed to all parties listed in Table 1.

Table 1: Distribution List

<i>Number</i>	<i>Organization</i>
1	Canadian Coast Guard
2	Transport Canada
3	Fisheries & Oceans Canada
4	Environment and Climate Change Canada
5	B.C. Ministry of Environment & Climate Change Strategy
6	Western Canada Marine Response Corporation
7	Vancouver Fraser Port Authority
8	Squamish Nation
9	Musqueam Indian Band
10	First Nations Health Authority
11	Vancouver Coastal Health
12	Metro Vancouver
13	District of West Vancouver
14	City of North Vancouver

15	District of North Vancouver
16	Village of Belcarra
17	Village of Anmore
18	City of Port Moody
19	City of Burnaby
20	City of Vancouver
21	North Shore Emergency Management
22	Imperial Oil Company
23	Parkland Corporation
24	Shell Canada Shellburn
25	Suncor Energy
26	Trans Mountain Corporation
27	Arbutus Point Marine
28	Island Tug & Barge
29	Marine Petrobulk
30	Minerva Bunkering

Preface — How to Respond to Marine Pollution Incidents

Pollution Detection & Notification

Vessels that release pollutants, or that have an incident where marine pollution could result, are required by Canadian and international law to report the incident to the appropriate authorities – in Canada this report goes to the CCG.

All facilities including those that handle oil (IOCO, Suncor, Shell, Trans Mountain, & Parkland in Burrard Inlet) are also required to report discharges to marine waters to the CCG.

Land-based spills are reported to EMBC.

In many cases, TWN will be notified that a marine pollution incident has occurred by the CCG, MOE, WCMRC, or the Responsible Party.

In some cases, polluters may not be aware that they have had a spill, or they may not comply with the requirement to report a spill. If this were to occur, it is possible that a community member or TWN employee might notice signs of marine pollution on the water or shoreline. Such pollutants should be reported to the CCG or EMBC, as appropriate, and to the TWN Initial Incident Commander.

If You Detect a Spill or Suspected Marine Pollution, Take the Following Actions

IMMEDIATELY REPORT the incident:

- Report marine spills to the CCG: **800-889-8852**
- Report spills from a land source to the EMBC: **800-663-3456**
- Reports can also be directed through local emergency services: **911**

IMMEDIATELY NOTIFY TWN Initial Incident Commander:

604-353-2106

- Try to stay upwind of the spill to avoid exposure to toxic fumes
- Use any available means to document the spill – safely collect information such as:
 - Time and date
 - Location

- Estimated size and appearance of the pollutant
- Direction in which the pollutant appears to be moving
- Current weather and sea conditions at the scene—wind speed and direction, visibility, sea state, etc.
- Presence of any wildlife in the immediate area
- Nearby vessels or other potential sources of the spill
- Photographs or videos of the scene

DO NOT attempt to clean-up or contain the spill unless you have the appropriate training and protective equipment.

DO NOT approach or attempt to help oiled wildlife.

Be aware of potential for explosive gasses. **DO NOT USE** lighters, start engines, or take any action that could ignite them.

TWN Notification & Response Phase

Once the TWN Initial Incident Commander has been notified that a marine pollution incident has occurred, it is his/her responsibility to notify the appropriate leadership and potential responders in the TWN government or community.

Initial Response Phase

- During the Initial Response Phase, other parties with direct roles like the Responsible Party, CCG, WCMRC, or VFPA will begin to mobilize and deploy resources

During this phase, the TWN Initial Incident Commander should:

- Participate in any inter-governmental coordination calls
- Direct GRS implementation to protect high priority sites that are potentially affected by the pollutants
- Collate data about resources at-risk and sensitive areas

- Begin to collate TWN knowledge and science about what is going on in and around the area of pollution:
 - Types of fish or wildlife that may be present, and any particularly sensitive life stages or habitats
 - Harvesting activities that could be affected
 - Environmental conditions (visibility, wind, currents, sea state, weather forecasts, trajectory model output, etc)
 - Logistical considerations for accessing the pollution location
 - Observe and track pollutant movement using personnel in boats, on land, with drones, or in aircraft
- Keep TWN Chief & Council, employees, community members, and Raven Woods residents informed of safety considerations and response status

The Initial Response Phase may last from minutes to hours, and in some cases even days. It transitions as additional resources and capability are brought to the incident. However, some small or minor incidents may never move beyond the initial response phase.

Pollutant Sampling

TWN should obtain a sample of the pollutant within 72 hours of the marine pollution incident and ship to SGS AXYS Analytical Services in Sydney for analysis. Heavier spilled oil changes over time when exposed to the environment in a process called weathering. It is vital to collect samples in a timely fashion before significant weathering to be able to definitively identify the source.

Response Phase

The Response Phase begins when an Incident Command Post is established and staffed (see Figure 1). Only trained TWN staff or community members should participate in the response.

Key considerations during the spill response phase include:

- Assigning personnel to roles in the Incident Command Post and to field response (see Table 2)
- Key concerns include:

- Having TWN representation in Unified Command to ensure TWN policies, procedures, and community interests are adequately addressed in setting priorities and directing the response
- Including key knowledge-holders and TWN scientists in the Environmental Unit to describe resources at-risk using ICS Form 232
- Establishing “endpoints” for clean-up and the Response Phase—ensuring that polluted areas are left in a state agreeable to TWN
- To ensure cost recovery, all TWN activities must be recorded in daily ICP Incident Action Plans. Detailed records should describe all actions taken, costs incurred, and expenditures made by TWN, including:
 - TWN justification for actions and expenditures
 - Unified Command approval/direction for TWN expenditures (including copies of all Incident Action Plans—ICS Forms 202-206 & 208)
 - Itemized receipts for TWN purchases
 - Documentation of TWN equipment usage (logs that document use of vessels, heavy equipment, etc)
 - Timesheets with activity descriptions for TWN personnel (ICS Form 214)
 - Other information such as photographs or videos that document what was done or expended by TWN
- Keep TWN Chief & Council, employees, community members, and Raven Woods residents informed with regular, fact-based information releases developed by the TWN Information Officer (in coordination with Unified Command and the JIC, if active)

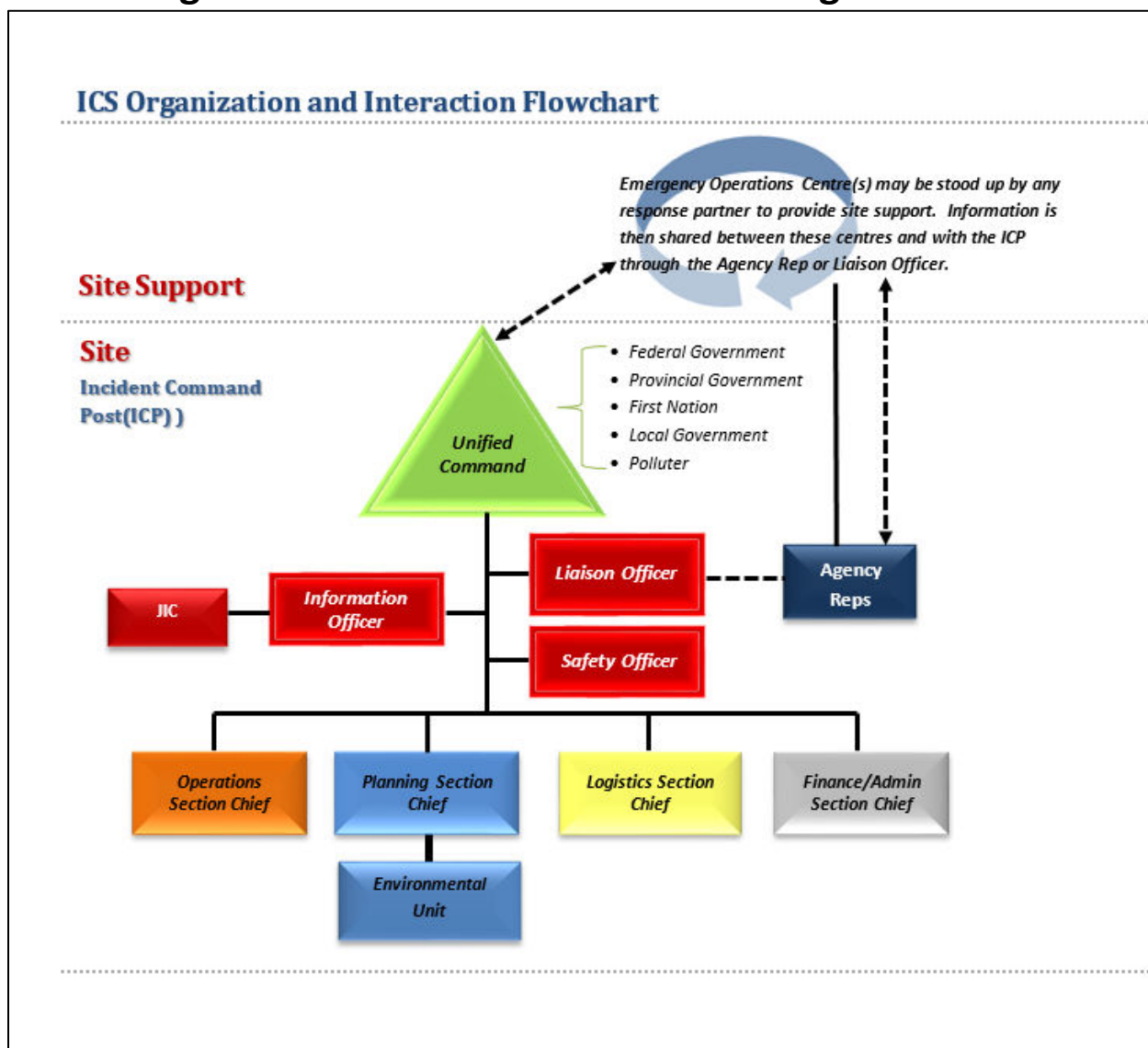
Incident Command Post Organization

Figure 1 provides an overview of Incident Command Post organization including its relationship to external municipal, port, or provincial Emergency Operation Centres should they be activated.

At barest minimum, TWN will need representatives in Unified Command, the Environmental Unit of the Planning Section, and on SCAT teams. In addition, a TWN Information Officer should participate in the JIC, the Joint Information Centre, and the TWN Safety Officer should confer and coordinate with the ICP Safety Officer.

In Unified Command, TWN should avoid any situation where the Nation's conduit to the ICP is through a Liaison Officer if TWN title, rights, or interests are in jeopardy. When TWN's interests are threatened by a marine pollution incident, TWN's position as a third order of government in Canada necessitates direct representation in Unified Command on equal footing with the provincial and federal governments.

Figure 1: Incident Command Post Organization



In the field, TWN should deploy archaeologists or archaeology monitors to ensure that shoreline protection, assessment, or clean-up activities are conducted in a way that limits disturbance to archaeological or cultural heritage sites.

Post-Incident Recovery Phase

The response phase typically ends when all parties in Unified Command agree that the pollution has been adequately cleaned up, or that a point of diminishing returns has been reached and additional clean-up activity would cause more harm than good.

Inevitably, there will be pollutants that linger after the spill response concludes.

Post-incident recovery activities should focus on promoting the remediation and restoration of injured environmental or cultural resources, affected habitats and species, and the health of TWN employees, the TWN community, its members, and Raven Woods residents.

Recovery also includes: 1) filing claims for financial reimbursement of TWN response expenses from the Responsible Party or the Ship-Source Oil Pollution Fund and 2) receiving compensation for economic harm, further study, and any residual damage to environmental, cultural, or community health.

Table 2: TWN Responder Assignments

<i>Response Position</i>	<i>TWN Assignee</i>	<i>Responsibilities</i>
Initial Incident Commander	TLR Spill Responder	Upon notification of a marine pollution incident, liaise between TWN, CCG, BCMOE, WCMRC, VFPA, & Responsible Party
		During initial response, direct Safety Officer, Communications Officer, Response Supervisor, Basic Responders, & Archaeologist/arch monitors, as needed
		For a sustained response, coordinate with TWN, CCG, BCMOE, WCMRC, VFPA, Responsible Party, neighboring First Nations & municipalities, and health authorities to establish and staff an Incident Command Post
Unified Command Representative	TLR Spill Responder/Director	Represent TWN in Unified Command (may be Initial Incident Commander) including advising on the selection and deployment of response options
		Concur on communication releases from JIC
		Approve clean-up end points & review achievement
Response Supervisor	Field Crew Lead	Supervise & direct Basic Responders
		Oversee monitoring of response activities to prevent/limit damage to natural resources, the environment, & cultural heritage
		Oversee pollutant sampling
Vessel Operator	Field Crew Lead	Operate vessels safely, as needed (may be Response Supervisor)
Basic Responder	Natural Resource Technician	Monitor response activities to prevent/limit damage to natural resources and the environment
		Collect pollutant samples
Archaeologist/ Archaeology Monitor	TLR Arch Monitor	Monitor shoreline activities to prevent/limit damage to cultural heritage (Arch Monitor may be Response Supervisor/Basic Responder)
		Participate at Incident Command Post in Environmental Unit

Environmental Unit Representative	TLR Spill Responder/TLR Environmental Monitors	Identify at risk natural & cultural resources & locations of concern
		Propose clean-up end points
SCAT Team Leader	Field Crew Lead	Lead TWN SCAT Team
		Assess achievement of clean-up end points
SCAT Team Member	Natural Resources Technician	Observe/participate on SCAT Teams
GIS Specialist	Inlailawatash GIS Analyst	Support TWN SCAT Team mapping
Information Officer	TLR Spill Responder	Participate on JIC Team at Incident Command Post
		Draft communications for Unified Command & TWN Chief & Council approval
Safety Officer	TLR Spill Responder	Protect health & safety of TWN responders, TWN employees, & TWN community members
		Protect health & safety of Raven Woods residents
		Monitor air quality at site of marine pollution incidents & curtail responder activity, if unsafe
Finance Section Representative		Ensure TWN time & expenses are accurately recorded and approved in every Incident Command Post "Incident Action Plan"
		Recoup response expenses from the Responsible Party or the federal Ship-source Oil Pollution Fund

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Glossary

AoC	Area of Concern
ATB	Articulated Tug and Barge
CCG	Canadian Coast Guard
CER	Canadian Energy Regulator
CNV	City of North Vancouver
COB	City of Burnaby
COV	City of Vancouver
CPM	City of Port Moody
DNV	District of North Vancouver
DWV	District of West Vancouver
EMBC	Emergency Management B.C.
FNHA	First Nations Health Authority
GRS	Geographic Response Strategy
GVIRP	Greater Vancouver Integrated Response Plan for Marine Pollution Incidents
ICP	Incident Command Post
ICS	Incident Command System
IOCO	Imperial Oil Company
IMO	International Maritime Organization
ITOPF	International Tanker Owners Pollution Federation
JIC	Joint Information Centre (associated with an Incident Command Post)
MIB	Musqueam Indian Band
MOE	B.C. Ministry of Environment & Climate Change Strategy
NEB	National Energy Board
OHF	Oil Handling Facilities
OPP	Oceans Protection Plan
OSRP	2016 TWN Oil Spill Response Plan and Preparedness Assessment
PC	Parkland Corporation
SC	Shell Canada Shellburn
SCAT	Shoreline Clean-up and Assessment Technique
SE	Suncor Energy
SN	Squamish Nation
SOPF	Ship-Source Oil Pollution Fund
TC	Transport Canada
TM	Trans Mountain Corporation

TSBC	Transportation Safety Board of Canada
TLR	TWN Treaty, Lands, & Resources Department
TWN	Tsleil-Waututh Nation
VCH	Vancouver Coastal Health
VFPA	Vancouver Fraser Port Authority
VOA	Village of Anmore
VOB	Village of Belcarra
WCMRC	Western Canada Marine Response Corporation

1.0 Scope & Background

The 2016 *Tsleil-Waututh Oil Spill Response Plan and Preparedness Assessment* detailed the resources, training, and cooperation necessary for TWN to participate in an oil spill response. It established 1) a plan for TWN community oil spill preparedness and response, and 2) identified the capabilities and gaps for TWN oil spill preparedness. It addressed following elements to support the active participation of TWN in oil spill response:

- Human resources to staff TWN participation Incident Command
- Operational resources and tactical plans necessary to protect environmental and cultural priorities
- Operational and human resources necessary to field a SCAT and archaeology team
- Training and exercise program necessary to establish and maintain proficiency and ensure overall readiness
- Integration with other regional partners and their related or overlapping oil spill preparedness efforts

This 2021 Update is not a stand-alone plan. It does not reproduce all the information in the 2016 Plan. The Update provides an overview of TWN values, vision, and policies from the original plan. Then it updates the risk assessment, areas of concern, geographic response strategies, notification policy, available response equipment, TWN capacity, and the GAP analysis. A full understanding of TWN plans, policies, and capacity requires review of both documents.

In addition, the 2016 Plan and 2021 Update are meant to be used in conjunction with a hierarchy of other plans and programs relevant to response to marine pollution incidents internationally, in Canada, in British Columbia, and in Burrard Inlet as described in Table 3.

Table 3: Programs & Plans Relevant to Marine Pollution Incident Response in Burrard Inlet

<i>Plan or Program</i>	<i>Description</i>
ITOPF (International Tanker Owners Pollution Federation)	ITOPF was established in 1968 to administer oil spill compensation. It now provides technical services and a team of scientists to support tanker and other large vessel owners and insurers. In the event of a marine pollution incident involving tankers or other large vessels, ITOPF representatives may attend the Incident Command Post.

	See www.itopf.org .
CCG Marine Spills Contingency Plan – National Chapter 2018	<p>This policy document provides overarching guidance for CCG regions on how to manage the national and regional Environmental Response Programs to be compliant with regulations, standards, and the oil spill response regime.</p> <p>See www.ccg-gcc.gc.ca/publications/environmental-environnementale/marine-pollution-deversements-en-mer/docs/MSCP2018-eng.pdf</p>
CCG Marine Spills Contingency Plan – Western Region 2019	This strategic document details how the Environmental Response teams are managed, trained, conduct operations, procure, and maintain marine pollution response equipment.
Canada/US Joint Marine Pollution Contingency Plan – CANUSPAC Annex	This plan details how Canada and the USA will cooperate to respond to cross-border marine pollution incidents.
CCG 2020 Greater Vancouver Integrated Response Plan for Marine Pollution Incidents	This plan is a guide for multi-agency response to marine pollution incidents of potential significance in British Columbia in the waters surround the Greater Vancouver Area.
B.C. Marine Oil Spill Response Plan	Provincial plan outlining how BC will organize and respond in the event of a marine spill anywhere in the province.
Vancouver Fraser Port Authority	See www.portvancouver.com/about-us/security-emergency/emergency-management
WCMRC Oil Spill Response Plan and Geographic Response Strategies	<p>This plan forms the basis of WCMRC’s procedures to respond to marine oil spills. It is in line with the requirements of the Canada Shipping Act, 2001 – Response Organization and Oil Handling Facilities Regulations and Response Organization applicable regulations and standards.</p> <p>See wcmrc.com/app/uploads/WCMRC-Oil-Spill-Response-Plan.pdf</p> <p>WCMRC has completed Geographic Response Strategies for certain locations in and around Burrard Inlet.</p> <p>See coastalresponse.ca</p>
Imperial Oil Company	“Emergency Response Plan”
Parkland Corporation	“Emergency Response Plan”
Shell Canada Shellburn	“Emergency Response Plan”
Suncor Energy	“Emergency Response Plan”
Trans Mountain Corporation	“Emergency Response Plan”
Westridge Marine Terminal	“Emergency Response Plan”
Arbutus Point Marine	“Ship Oil Pollution Emergency Plan”
Island Tug & Barge	“Ship Oil Pollution Emergency Plan”
Marine Petrobulk	“Ship Oil Pollution Emergency Plan”

Minerva Bunkering	"Ship Oil Pollution Emergency Plan"
Large Vessels	"Ship Oil Pollution Emergency Plan"

A Review of TWN Values, Vision, & Preparedness from the 2016 OSRP

TWN brings unique history, values, sensitivities, concerns, title, rights, interests, and capacity to the local marine pollution incident response regime that are not represented anywhere in the hierarchy of programs and plans described in Table 3. In particular, TWN interests centre on Burrard Inlet, but span from Boundary Bay and the Fraser Estuary in the south to Howe Sound in the north. This entire area is often referenced as the TWN Consultation Area, or sometimes the TWN Territory.

What follows is a synopsis of TWN guiding principles, policies, and preparedness goals originally described in the 2016 Plan. They remain valid today.

Guiding Principles

- TWN has a sacred, legal obligation to protect, defend, and steward the water, land, air, and resources of our territory.
- Our stewardship obligation includes the responsibility to maintain or restore conditions that provide the environmental, cultural, spiritual, and economic foundation for our nation to thrive.
- Burrard Inlet has a limited environmental carrying capacity and cannot support continuous growth or expansion of oil storage and transportation projects. Every new industrial activity contributes to cumulative risks and impacts to Burrard Inlet. TWN's stewardship of Burrard Inlet compels us to take a precautionary approach to any new industrial activities in our territory.
- TWN has undertaken significant efforts to protect or restore Burrard Inlet and the waters, lands, and resources within our territory and build resiliency against climate change impacts.
- Any oil spill that impacts or threatens to impact Burrard Inlet or our territory affects TWN.
- We expect active and meaningful engagement with our federal and provincial partners, our Musqueam and Squamish neighbors, and local municipalities in developing a coordinated and transparent, shared capability to respond to oil spills in Burrard Inlet and in our territory.
- We expect oversight of post-spill project management to be jointly administered by the federal, provincial, and affected First Nation governments.
- Just as this TWN OSRP recognizes the roles of our federal, provincial, and municipal governments in oil spill preparedness and response, we expect that our partners will acknowledge in their oil spill response plans TWN roles and responsibilities.

Policies

TWN's inherent jurisdiction and law is expressed through our snəwayəł, or our teachings. They provide the underlying context for our participation in oil spill prevention, preparedness, and response. Based on this, TWN has adopted several policies related to oil spill prevention and response:

- TWN believes that preventing oil spills is the most effective way to avoid adverse impacts. Best available technology and international best practices for oil spill prevention should be standard practice for all activities that create oil spill risks.
- Oil spill preparedness must be predicated on identifying and understanding worst case scenarios, even when the probability of these events is very low. By preparing for the worst case, we also prepare ourselves for less severe oil spills.
- In order to protect archaeological and cultural heritage resources, no beach protection, assessment, or clean-up activities shall be conducted along shorelines in Burrard Inlet without prior approval by TWN or its representative in Unified Command, if active.
- No chemical spill treating agents (dispersants or shoreline treating agents) shall be applied in our territory without the consent of TWN or its representative in Unified Command, if active.
- TWN believes in-situ burning is not a viable option for oil spill response in our territory, because of the potential for smoke plumes to impact populated areas and the potential for burn residues to sink and harm benthic aquatic life.
- TWN stewardship law establishes the requirement for "net environmental benefit," meaning that, in the event of an oil spill, the responsible party shall restore the environment to a condition better than its pre-spill state.
- TWN stewardship law requires that a baseline of current environmental conditions be established and periodically updated to use in the assessment of the effects of spilled oil.

Preparedness Goals

- *Notification of Marine Pollution Incidents:* TWN will receive early notification of all classes of spill incidents occurring in Burrard Inlet
- *Oil spill Response Planning, Training, and Exercises:* TWN will fully participate.
- *Unified Command Decision-making:* TWN will fully participate in decision-making, including setting priorities in all areas of response.
- *Environmental Unit Participation:* TWN will fully participate in the Environmental Unit and SCAT teams, and bring local knowledge and a policy and procedures for environmental sampling during the early stages of any spill event.

- *Human Health and Safety*: a priority is to protect human health and safety for TWN members on reserve and for residents of Raven Woods.
- *Selection and Deployment of Response Options*: a priority is to ensure that response option selection and deployment processes, including any related net environmental benefit analyses, incorporate TWN policies and priorities, including our policies on the use of chemical treating agents, beach protection, assessment, or clean-up authorization, and net environmental benefit requirements.
- *Protection of Archaeological and Cultural Heritage Sites*: a priority during shoreline protection, assessment, or clean-up is to ensure that all activities are conducted without further disturbance to archaeological or cultural heritage sites.
- *Ecological Health and Protection*: a priority is to ensure spill response activities include protective measures to reduce adverse impacts and that environmental protection, monitoring, and related environmental assessments are transparent and rely on the best available science, local knowledge, and peer review.
- *Information Management*: a priority is to participate in joint messaging within Unified Command and provide a liaison between the community and TWN staff assigned to the incident management to ensure ongoing two-way communications.
- *Volunteer Coordination*: a priority is to provide a coordinating mechanism that allows interested community members to contribute appropriately to spill response.
- *Post-Spill Recovery*: a priority is to ensure procedures are in place for cost recovery, evaluation, and restoration of ecological damages and community health, and for cultural impacts assessment and healing.

Other Key Points

- The TWN OSRP establishes procedures for managing oil spill preparedness and response, and it establishes policies regarding oil spill response methods and priorities for spills that impact our Consultation Area.
- TWN is committed to working with our oil spill response partners to share our science and local knowledge about Burrard Inlet and to communicate our unique perspective on oil spill impacts and consequences.
- TWN is committed to active and constructive participation in marine oil spill risk reduction activities in Burrard Inlet, through cooperative arrangements with our federal, provincial, and municipal partners and through ongoing dialogue with existing industry.
- A TWN preparedness goal is to ensure that adequate funding exists for TWN to meaningfully participate in oil spill planning, preparation, exercises, and incident response.

- TWN expects to be notified as early as possible of any oil spills or potential oil spills that may affect the waters, lands, and resources within our Consultation Area. Once notified, TWN will determine whether to get directly involved in the response based on the location, severity, and consequences of the spill.
- Oversight of the recovery phase of oil spill response should be jointly administered by the federal, provincial, and affected First Nation governments.

Legal Force of TWN 2016 OSRP and 2021 Update

With formal adoption by Chief and Council, this Plan and Update becomes an expression of TWN law, described in hə́nqəmiḥə́m (Downriver Halkomelem) as *snəwayəł*, ‘our teachings’. In Canada, Indigenous legal traditions stand beside civil and common law. Legal scholars like John Borrows from the University of Victoria have noted that Indigenous law can be strengthened by more formal recognition within the Canadian legal and governance systems.

For this Plan and Update, incorporation by reference in the each of the plans listed in Table 3 might strengthen how the 2016 OSRP and 2021 Update can and should be used. Such recognition would signal respect for TWN governance rights. Additional action to give legal force to TWN plans deserves a more thorough analysis.

2.0 Greater Vancouver Integrated Response Plan

Summary

The most glaring inconsistency between the 2016 OSRP/2021 Update and the GVIIRP is the CCG’s aspiration that only one First Nation represent all affected First Nations in Unified Command. The federal government has never directly discussed this limitation with TWN, considered how it infringes on TWN governance rights, or asked for TWN consent.

A second significant inconsistency relates to international and Canadian law that sets the response and recovery objective as simply returning the affected environment to pre-spill conditions. TWN’s perspective is that the long history of cumulative environmental degradation and cultural harm the Nation has experienced necessitates a higher standard as part of the cost of doing business. To that end, TWN adopted a policy of “net environmental benefit” as the recovery objective after marine pollution incidents.

The GVIIRP is a guide for multi-agency response to marine pollution incidents of potential significant in the waters surrounding the greater Vancouver Area. It was developed after the controversial 2015 M/V Marathassa spill and response. The CCG engaged other federal departments, provincial ministries, First Nations, local governments, and private sector interests to develop the plan.

While TWN staff worked with the CCG on the plan, Chief & Council were not asked to review or concur with it as promulgated on June 18, 2020 by Roger Girouard, Assistant Commissioner for the Western Region of the CCG. There are consistencies and inconsistencies with the 2016 OSRP and this 2021 Update as detailed below.

Consistencies

- The GVIRP guiding principles generally align with TWN guiding principles and preparedness goals. The GVIRP prioritizes health & safety, environmental stewardship (including cultural heritage), respectful relationships, and timely response.
- The GVIRP recommends a schedule of training and exercises much like presented in this 2021 TWN update.
- The GVIRP acknowledges that TWN may suffer adverse impacts to community health from marine pollution incidents (but without any proposed recovery mechanisms or compensation schemes).
- The GVIRP states that the TWN Initial Incident Commander, if TWN is affected, will be invited to participate in initial coordination calls.
- The GVIRP, consistent with federal directives and TWN policy, assumes the use of the ICS to manage any marine pollution incidents.
- The GVIRP recognizes that knowledge and information from Indigenous communities is required to inform response actions and assist responders. In particular, cultural information about activities, species, habitats, or other areas of importance must be incorporated into the response planning.

Inconsistencies

- The GVIRP recognizes that there is a hierarchy of plans governing response to marine pollution incidents in Canada, but it does not explicitly call out, reference, or incorporate the 2016 OSRP as adopted by the TWN government. It suggests only that the GVIRP should be considered in conjunction with First Nation plans, but without any legal force.
- During the initial assessment of marine pollution incidents (prior to the establishment of an ICP), there is no recognition that TWN responders might attend the site gathering critical information to contribute to initial coordination calls.
- The GVIRP assigns the decision to mobilize resources for a coordinated response to the CCG or MOE without any reference to TWN governing authority.
- The GVIRP proposes that one First Nation represent all affected First Nations in Unified Command.
- The GVIRP indicates the primary responsibility of the Environmental Unit in the Planning Section is to “balance” social, cultural, ecological, and commercial values when making recommendations to Unified Command. There is no explicit recognition that TWN title, rights, or interests might supersede other interests.

- The GVIRP does not incorporate TWN policies on shoreline activity, use of dispersants/shoreline cleaning agents, or recovery requiring “net environmental benefit.”

3.0 Updated Risk Assessment

Summary

While the worst-case scenarios and the environmental, cultural, and community health consequences of marine pollution incidents have not changed since completion of the 2016 risk assessment, the likelihood of incidents will increase when the new Trans Mountain pipeline becomes operational and more vessels call at the Westridge Marine Terminal.

In addition, the likelihood of spilled diluted bitumen submerging or sinking was underestimated by the 2016 NEB/CER review of the Trans Mountain expansion proposal.

Overall, about half of the marine incidents in Burrard Inlet involve recreational vessels in False Creek, with or without diesel, gasoline, or hydraulic fluid leaks or spills. For the worst-case scenario (a 16,000 m³ spill of diluted bitumen), model simulations suggest it will occur in 37 out of every 100 50-year simulations.

Burrard Inlet is a marine extension of the Salish Sea, consisting of five major basins: Outer Harbour (including English Bay & False Creek), Inner Harbour, Central Harbour, Indian Arm, and Port Moody Arm. The primary Tsleil-Waututh Reserve occupies about 100 hectares of land and 100 hectares of adjacent marine waters on the north shore of the Central Harbour.

Significant urban, commercial, and industrial development has occurred along the Burrard Inlet shoreline. VFPA spans all of Burrard Inlet, including Indian Arm and Port Moody Arm. Marine oil handling facilities occupy the Central Harbour across the inlet from the Tsleil-Waututh Reserve, as well as in Port Moody Arm. Vessels carrying oil as fuel and cargo regularly transit Burrard Inlet, and fuel oil is regularly supplied to large vessels through a transfer called bunkering, a method of refueling.

These conditions mean that there is a significant risk of oil spills or other marine pollution incidents. At its most basic, risk assessment is defined as the product of the likelihood of an incident times its consequences. In Burrard Inlet, likely incidents occur, on average, every other day, but they are generally, relatively low consequence to the environment. High consequence spills occurred in 1959 (Dollarton), 1973 (Stanley Park), 2007 (Burnaby), and 2015 (English Bay) in recent history.

Vessel Traffic Projection

At present, about 3,160 vessels call at the VFPA each year including Burrard Inlet, the Fraser River, and Roberts Bank — an average of nine ships per day. This is in addition to vessel traffic associated with ongoing port activities such as tugboats, and maintenance and construction vessels. Based on a 2016 analysis, the number of vessel calls may increase to about 12 ships per day by 2026.

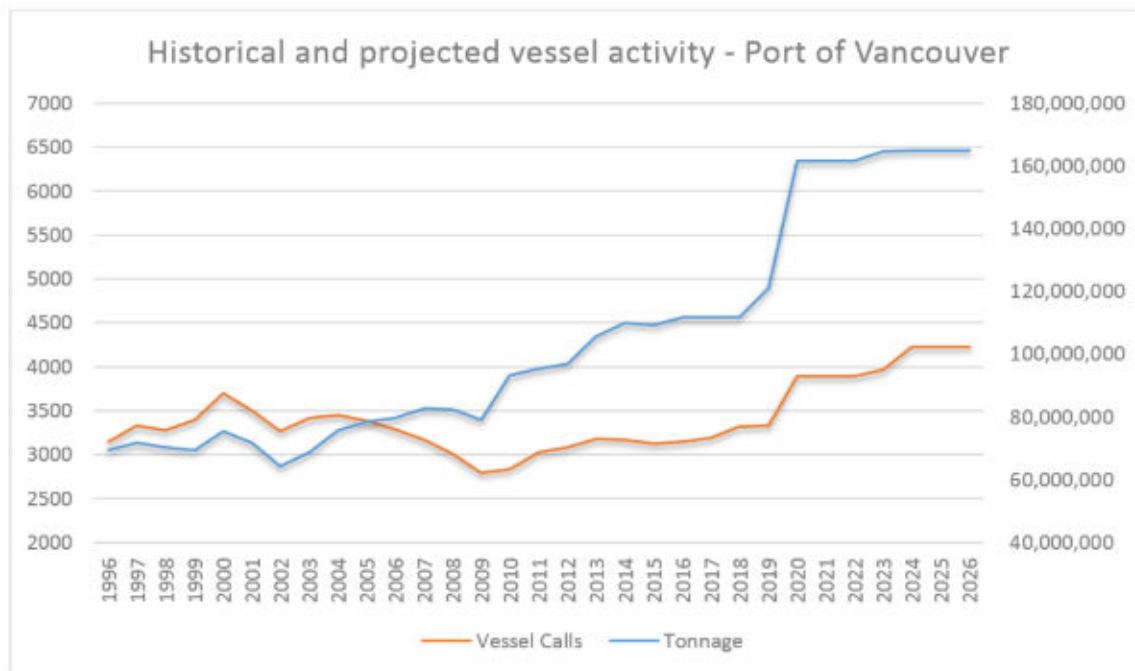
In Burrard Inlet, major shippers, terminals, or vessel operators include:

- Cargill
- Chemtrade,
- Centerm—DP World
- Fibreco
- Lynnterm—Western Stevedoring
- Neptune Terminals
- Pacific Coast Terminals
- SAAM Smit Towage
- Seaspam
- Trans Mountain/Westridge Marine Terminal
- Vancouver Wharves—Taseko & Pembina
- Vanterm—Global Container
- Viterria
- West Coast Reduction

Figure 2, created by VFPA, provides a history and forecast for the number of vessels and the weight of the cargo they bring, known as tonnage. In their analysis, the projected increase in tonnage though 2026 does not result in a proportional increase in vessel calls. Vessel calls grow at a slower rate than tonnage because vessel size is increasing allowing them to carry more weight.

Figure 2 includes increased vessel traffic resulting from Trans Mountain's expansion. Starting in 2019, the projection has vessel calls at Westridge Marine Terminal increasing from approximately one/week to one/day. Permitting, construction, legal challenges, and pandemic delays have moved the start date to 2023 at the earliest. Other vessels, such as ferries and recreational craft, are not included in this analysis.

Figure 2: VFPA Projection of Vessel Traffic Growth



Products & Spill Sources

VFPA ships and receives a variety of cargo, including:

Hydrocarbons

- Crude oil—including diluted bitumen and refined oils like diesel, gasoline, aviation gas, and jet fuel
- Bunker fuel oil, other petroleum products, and distillates

Other Cargo

- | | |
|-----------------------|-----------------------|
| • Automobiles | • Minerals |
| • Canola oil | • Phosphate rock |
| • Chemicals | • Potash |
| • Coal | • Pulp/paper |
| • Food waste—rendered | • Shipping Containers |
| • Grain | • Sulfur |
| | • Wood Pellets |
-

Potential sources of spills include:

Spill Sources—vessels, bunkering, oil handling & other facilities, pipelines, railcars, stormwater

Non-Floating Oil Considerations

Cargo moving out of the VFPA includes diluted bitumen shipped from the Westridge Marine Terminal located in the Central Harbour. The product may have an increased likelihood over other crude oil products for sinking or submerging upon release into the environment (see Figure 2).

Crude oil is made up of hydrocarbons ranging from volatile, light materials (such as propane and benzene) to more complex heavy compounds (such as bitumen, resins, and waxes). An oil's viscosity, density, and other inherent properties are strong determinants of the potential for the oil to submerge or sink.

Bitumen is old, heavy crude oil. It is too thick and viscous to readily flow through a pipeline or be easily loaded on a tanker. For transport, it is typically diluted with another component, a gas condensate, to enable it to readily flow.

Weathering of spilled diluted bitumen may lead to its submergence or sinking. Weathering processes may include evaporation (especially of the gas condensate), biodegradation, natural dispersion, adhesion to materials, interaction with mineral fines, emulsification, dissolution, photo-oxidation, and sedimentation. Certain types of physical weathering may lead to submergence or sinking of some portion of the spilled oil.

Factors contributing to increased likelihood of submergence or sinking of diluted bitumen include:

- Water Density: if spilled oil is denser than the receiving water, it sinks. Heavy oils spilled to fresh water may result in the oil sinking more quickly. Density is affected by both salinity and temperature.

- Salinity: oil is more likely to sink in freshwater, but may refloat in salt water. Oil in a river may travel along the river bottom until it reaches the ocean, where it may refloat. Oil in a marine zone may start to sink when it enters an estuary or other low-saline area.
- Temperature: oil is more likely to sink in cold water because temperature affects the density of oil. Higher temperatures cause lower oil densities and faster weathering (evaporation). Lower temperatures increase density and reduce evaporation rates. During a spill, oil may sink and refloat over the course of each day as the surface temperature changes.
- Water Turbidity: turbulence can result in sedimentation that increases an oil's density causing it to submerge or sink. High turbidity in the waterway may result in the formation of oil-mineral aggregates, which may result in sedimentation and sinking of the oil.
- Waterway Currents: slower currents may allow submerged oil to sink and remain in place, whereas fast currents will churn oil into a suspension in the water column.
- Substrate Composition: mud is found in low-energy areas, where sunken oil may settle, collect, and remain in place. Sand indicates a medium-energy area, and gravel indicates high-energy where sunken oil is unlikely to collect or remain in place.
- Shoreline Composition: sediment mixing happens when oil strands on a shore and mixes with sandy sediments, or when wave action mixes sediments with oil in the water column. Wave interaction with sandy beaches may result in the formation of tar balls and sinking oil.

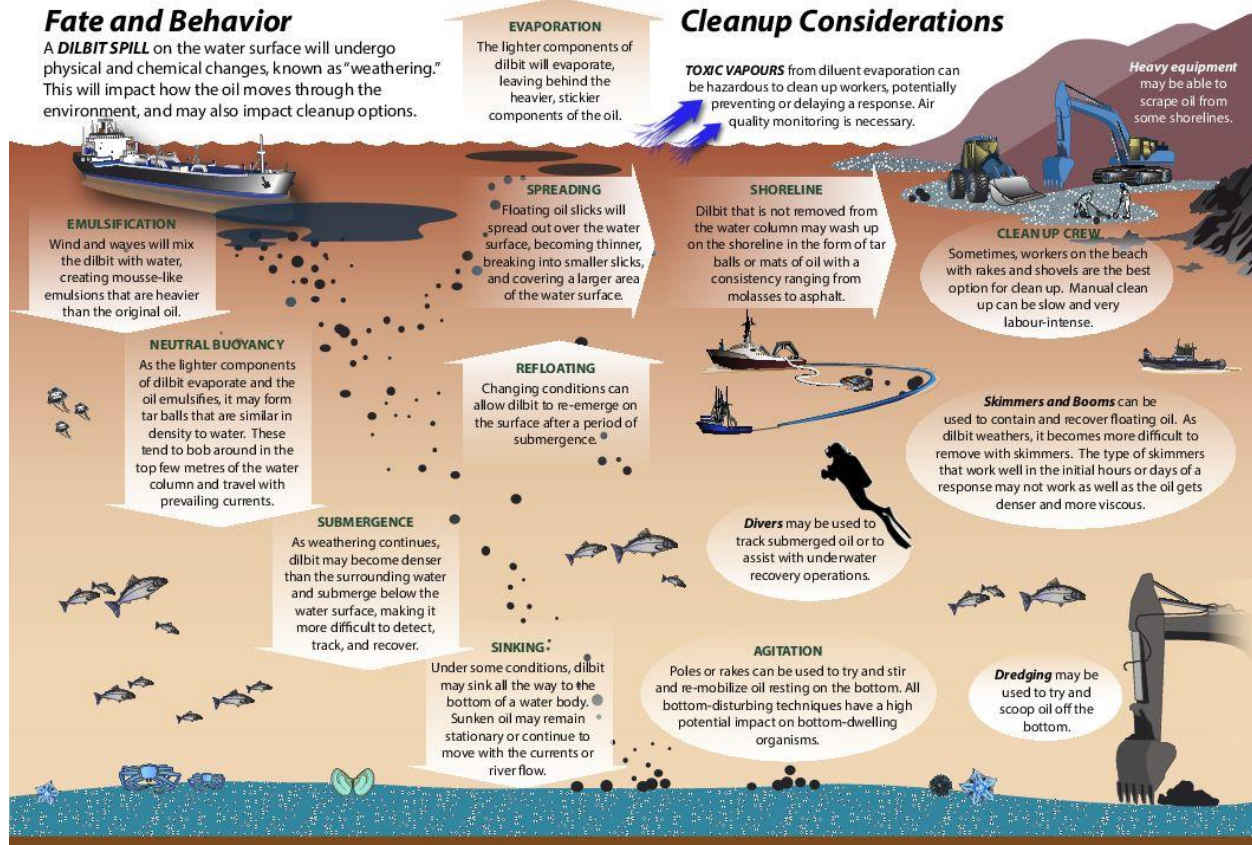
Traditional response methods focus on containing and recovering floating oil using containment booms and on-water skimmers. However, crude oils that sink or become suspended in the water column cannot be successfully recovered with floating oil tactics.

During any response with the potential for submergence or sinking of crude oil, priority should be given to preventing, minimizing, or containing spills at their source. Additionally, since diluted bitumen may initially float before weathering occurs, rapid and aggressive surface oil recovery efforts should be pursued in the first 72 hours after a spill.

If crude oil did sink after a spill in Burrard Inlet, it is imperative that a more sophisticated methodology be applied to locate it than what was used during the 2015 M/V Marathassa incident. The methods used then did not involve a systematic survey, but only a few checks of randomly selected locations by dragging sorbent pads across the seafloor.

Figure 2: Fate & Behaviour of Spilled Diluted Bitumen

What Happens When Diluted Bitumen Spills?



NEB/CER Review of Non-floating Oil in Burrard Inlet

The 2016 NEB/CER review of the Trans Mountain pipeline and tanker expansion proposal concluded that there was little likelihood of spilled diluted bitumen submerging or sinking in Burrard Inlet. The NEB/CER accepted data provided by Trans Mountain that there was always little suspended sediment and near ocean-like salinity throughout Burrard Inlet. Under these conditions, they concluded research to date suggested the diluted bitumen would remain floating.

What the NEB/CER failed to recognize is that in the spring during the Fraser River freshet, fresh water and suspended sediment flow into Burrard Inlet, some making its way through First Narrows into the Inner Harbour. During this period, surface water, particularly in the Outer Harbour, has lower salinity and higher levels of suspended sediment. These are conditions that increase the likelihood of submergence or sinking of spilled diluted bitumen.

Fraser Plume



Common Incidents

A review of a CCG Incident Database for Burrard Inlet found a total of 488 incidents reported from 2017 to 2019.

<u>Location of Incident</u>		<u>Type of Pollutant</u>	
• Indian Arm	28	• Diesel	85
• Port Moody Arm	23	• Other fuel	33
• Central Harbour	27	• Crude oil	27
• Inner Harbour	111	• Hydraulic fluid	24
• Outer Harbour	66	• <u>Other</u>	<u>53</u>
• <u>False Creek</u>	<u>233</u>		
	TOTAL 488		TOTAL 222

222 out of 488 incidents had identified pollutants as detailed above. “Other” pollutants include canola oil, bilge water, chlorinated water, sewage, etc. 266 out of 488 incidents had only the potential to pollute or unidentified pollutants.

Nearly half the 488 total incidents, 233, were in False Creek—mostly sunken recreational vessels with or without small fuel leaks.

Worst-Case Scenario

A spill scenario developed as part of TWN’s 2015 assessment of the Trans Mountain pipeline and tanker expansion project remains the worst-case scenario. A 16,000 m³ spill — two compartments in a tanker or tankers resulting from allision, collision, or grounding accident.

Worst-Case Spill Trajectory

Based on the research completed by TWN, Table 4 identifies where spilled oil is likely to move after 48 hours. Three spill sources were modeled: Westridge Marine Terminal, Second Narrows, and First Narrows. The analysis is based on numerous simulated spill runs incorporating seasonal variation in wind/sea state conditions. In each case, the portion of oil in the primary receiving basin that stranded on the shoreline was also calculated.

**Table 4: Spilled, Floating Oil —
location 48 hours after an incident**

<i>Spill Location</i>	<i>Spill Trajectory</i>					
	Outer Harbour	Inner Harbour	Central Harbour	Indian Arm	Port Moody Arm	On Shoreline
<i>Westridge</i>	Trace	2%	80%	12%	6%	92-100%
<i>2nd Narrows</i>	6%	63%	29%	1%	1%	87-100%
<i>1st Narrows</i>	54%	42%	2%	Trace	Trace	66-99%

Loading/Bunkering

In Burrard Inlet, there are two other worst-case scenarios to consider: 1) an incident during tanker loading operations at Westridge Marine Terminal or 2) an incident during bunkering while the receiving vessel is anchored or docked in the Outer, Inner, or Central Harbours of Burrard Inlet.

For the Westridge Marine Terminal, the 2015 TWN assessment suggested the worst-case scenario while loading a tanker there was an incident spilling 8,000 m³ of diluted bitumen into the Central Harbour.

For bunkering, large vessels can carry more than 12,000 m³ of Bunker C fuel oil. While full loss of this volume of product is unlikely, spilling even a percentage while being pumped from a barge or supply ship presents a worst-case scenario.

Most bunkering occurs in the Inner Harbour, but ships that are too large to enter can be supplied in the Outer Harbour. In addition, tankers are occasionally bunkered at the Central Harbour anchorages.

Primary bunkering companies in Burrard Inlet include: Seaspan/Marine Petrobulk (40% of activity), Suncor Energy/Island Tug & Barge, IOCO/Minerva Bunkering, Arbutus Point Marine, and Parkland Fuel (for BC Ferries).

VFPA Guidance on Spill Response during Bunkering

In the event of a spill during the transfer of bunker fuel products, all operations must stop immediately, and vessels involved must activate their *Ship Oil Pollution Emergency Plan*. The spill must be reported immediately to the VFPA pollution line or via VHF radio.

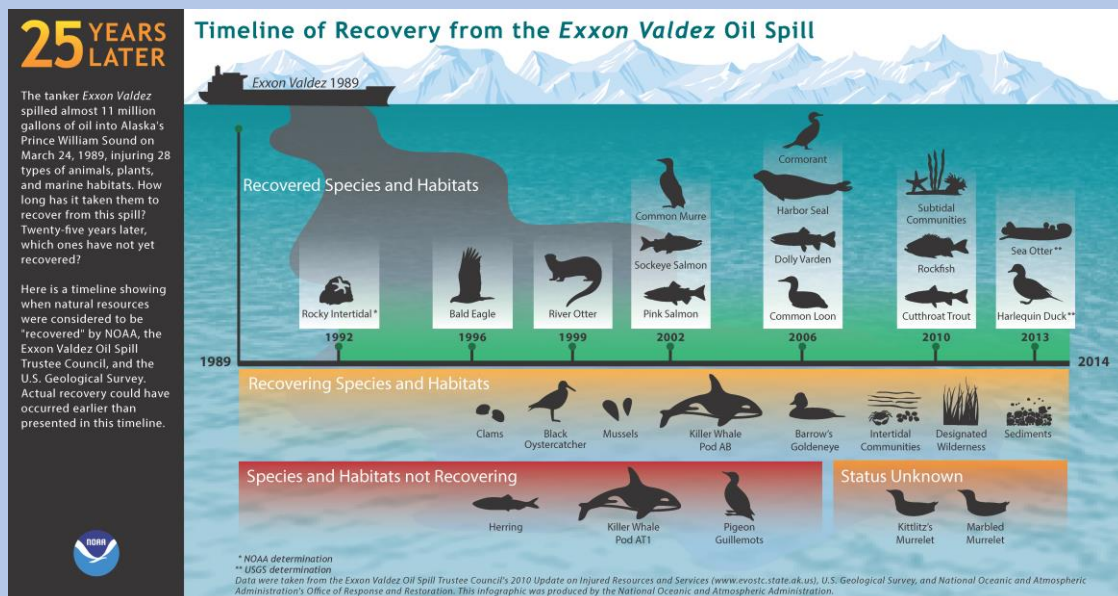
Consequences

The Exxon Valdez spill in Prince William Sound, Alaska occurred more than 30 years ago and the consequences of that spill have been and continue to be thoroughly studied. The monitoring record represents the best information available on the long-term consequences of a large spill. A comparable spill in Burrard Inlet might have similar consequences.

Exxon Valdez—a well-studied example of spill consequences

The Exxon Valdez oil spill was a human disaster that occurred when an oil tanker owned by the Exxon Shipping Company spilled more than 42,000 m³ of crude oil into Alaska's Prince William Sound on March 24, 1989. It was the worst oil spill in U.S. history until the Deepwater Horizon oil spill in 2010.

The Exxon Valdez oil slick covered 2,100 km of coastline and killed an estimated 250,000 sea birds, 3,000 otters, 300 seals, 250 bald eagles, and 22 killer whales. Nearly 30 years later, pockets of crude oil remain in some locations and several species have not recovered (see chart below).



Factors Increasing Consequences for TWN

Local factors in Burrard Inlet influence the consequences of marine pollution incidents for TWN. They include:

- **Location**—the north shore of the Central Harbour; near important archaeological sites, concentrated resource use areas, sensitive habitat, or restoration sites; or anywhere in Indian Arm
- **Timing**—a spill that occurs 1) during a critical time period such as fish spawning, bird nesting, bird or mammal migration, marine mammal mating or calving, or intensive feeding; 2) a spill that occurs just before or during subsistence, ceremonial, or commercial food harvest; 3) a spill that disrupts seasonal cultural work; or 4) a spill that occurs during periods of reduced visibility (night or fog) or high sea states

- Trajectory—a spill with conditions that drive the oil toward the north shore of the Central Harbour, into Indian Arm, or toward the Fraser Estuary

4.0 TWN Areas of Concern & WCMRC Geographic Response Strategies

Summary

WCMRC has developed 46 GRS for Burrard Inlet. In 2016, TWN has designated 16 areas of concern in Burrard Inlet. Since then, TWN added 8 additional areas of concern. To date, WCMRC has published GRS for 11 of the 24 TWN areas of concern (highlighted in yellow below).

WCMRC GRS can be reviewed at:

map.wcmrc.com/portal/apps/MapSeries/index.html?appid=994584ca38ee4f08adb7e778750810ff

GRS are industry standard tactics used to protect sensitive resources and areas from the effects of marine pollution incidents. TWN has identified areas of concern in Burrard Inlet that require GRS, while WCMRC has taken independent responsibility to develop GRS there. Overlapping locations are highlighted in yellow.

TWN 2016 Areas of Concern

- Indian Arm
 - Indian River Estuary (Say Nuth Khaw Yum)
 - Bishop Creek (Say Nuth Khaw Yum)
 - Twin Islands (Say Nuth Khaw Yum)
 - Strathcona Lookout Park
 - Belcarra Narrows
 - Belcarra Bay
 - t̄amt̄amíxʷt̄an/Belcarra Regional Park
 - Boulder Island
- Port Moody Arm
 - Rocky Point Mud Flats
 - Carraholly Point
 - Barnet Marine Park—eastern shoreline
- Central Harbour
 - Cates Park/Cates Landing (Whey-ah-wichen)
 - I.R. #3
 - Maplewood Mud Flats
- Inner Harbour
 - Stanley Park—northeastern shoreline
 - Deadman Island
- Outer Harbour
 - [Confidential]
- False Creek
 - [Confidential]

TWN Additional Areas of Concern

Since 2016, TWN has added the following as areas of concern:

- Indian Arm
 - Granite Falls (herring spawning)
 - Jug Island Beach (clam garden/fishing rock wall structure)
 - Bedwell Bay (eelgrass)
- Central Harbour
 - **Seymour River Estuary** (habitat restoration)
- Inner Harbour
 - **New Brighton Beach** (habitat restoration)
 - **Lynn Creek Estuary** (habitat restoration)
- Outer Harbour
 - Spanish Banks (eelgrass)
- False Creek
 - Fisherman's Wharf (herring spawning)

WCMRC GRS

- *Indian Arm*
 - Wigwam Inn
 - Grand Creek (Say Nuth Khaw Yum)
 - Bishop Creek (Say Nuth Khaw Yum)
 - Buntzen Bay (Say Nuth Khaw Yum)
 - Deep Cove North Shore Marina
 - Panorama Park
 - Belcarra Narrows
 - Belcarra Bay
 - Belcarra Regional Park (Tum-tumay-whueton)
 - Boulder Island
 - Admiralty Point
- *Port Moody Arm*
 - Rocky Point Mud Flats
 - Pacific Coast Terminal
 - Mossom Creek
 - IOCO Yacht Club
 - IOCO
 - Reed Point Marina
 - Burrard Power
 - Suncor
 - Barnet Marine Park—western shoreline
 - Barnet Cove
- *Central Harbour*
 - Westridge Marine Terminal (formerly Kinder Morgan)
 - Cates Park (Whey-ah-wichen)
 - Scenic Point Park
 - Maplewood Mud Flats
 - Parkland (formerly Chevron)
 - Connex Barges
 - Seymour River
- *Inner Harbour*
 - Lynnwood Marina
 - Viterra Cascadia Terminal
 - New Brighton Park
 - Lynn Creek
 - Neptune Terminal
 - Cargill Terminal
 - Smit Marine
 - Mosquito Creek
 - Crab Beach
 - MacKay Creek
 - Seaspan
 - Harbour Master Floats
 - Vancouver Harbour Air Terminal
 - Calamity Point Beach
- *Outer Harbour*
 - Second Beach
 - Heritage Harbour

- Kitsilano Beach
- Cypress Creek
- False Creek
 - [None]

5.0 Notification of Marine Pollution Incidents

Summary

The federal and provincial governments routinely fail to notify TWN, in a timely fashion, about most marine pollution incidents in its Consultation Area including Burrard Inlet. This failure violates TWN law and policy.

TWN Notification Policy

Tsleil-Waututh policy requires that its on-duty Initial Incident Commander receive notification as early as possible of any oil spills, potential oil spills, or any other marine pollution incident potentially or actually releasing pollutants the TWN Consultation Area including Burrard Inlet.

When the system works, TWN typically is notified by (in order of likelihood), 1) the province (MOE), 2) WCMRC, 3) the federal government (CCG), or sometimes the 4) Responsible Party.

TWN policy specifies that incident notifications should be based on their location and severity, consistent with the definitions set out in the B.C. Emergency Management Act Spill Reporting Regulation (B.C. Reg. 263/90). Under this regulation, marine pollution incidents are classed as Code 1 (non-urgent) or Code 2 (urgent).

TWN policy specifies that notification is required for all incidents that occur in Burrard Inlet regardless of their class (i.e., both Code 1 & 2 incidents). In the remainder of the Consultation Area, TWN should be notified about only Code 2 incidents.

For Code 1 incidents, e-mail or text notification is sufficient, while Code 2 incidents require notification by telephone call.

Table 5 below summarizes this process.

Table 5: Emergency Notification Procedure

<i>Spill Class</i>	<i>Location</i>		<i>Notification Method</i>
	<i>Consultation Area</i>	<i>Burrard Inlet</i>	
EMBC Code 1 (non-urgent)		☑	E-mail, text, or call
EMBC Code 2 (urgent)	☑	☑	Call

Upon review of the 2017-19 CCG Incident Database for Burrard Inlet introduced in Section 2 and after review of TWN records, TWN received less than 10 notifications for the 488 incidents documented.

Notification Case Study

Around 8:00 am on February 22, 2021, a bunkering operation spilled a small amount of fuel oil into the Central Harbour of Burrard Inlet between Tum-tumay-whueton and Whey-ah-wichen. The bunkering company immediately implemented its *Ship Oil Pollution Emergency Plan* (as required by VFPA) and deployed containment boom around the receiving vessel.

The CCG was not notified about the spill until 10:20 am and they never notified TWN. Instead, WCMRC notified TWN at 11:30 am, about three hours after the spill as their vessels arrived to assist at the scene.

GVIRP Notification Policy

“When the CCG Duty Officer’s initial assessment indicates that there is a potential for it to be a large-scale, complex incident or potential for the incident to have significant environmental, economic, or public/political concerns, the CCG Regional Operations Centre will initiate email notification to a pre-identified distribution list for the Plan Area.

The notifications are formatted to provide a brief synopsis of the incident and will be sent to federal, First Nation, and private sector contacts.... Email notification may be followed-up by phone notifications for those Nations or agencies that will be immediately impacted (page 26).”

The GVIRP policy fails to acknowledge or uphold TWN policy on a meaningful level.

6.0 Available Response Equipment—WCMRC, CCG, TWN

WCMRC, as a TC-certified Response Organization, has the largest cache of spill response vessels, equipment, and supplies on the west coast of Canada, much of it located at several locations in and around Burrard Inlet. In addition, they have sufficient personnel and external contractors to make full use of their cache.

With the ongoing Trans Mountain expansion, WCMRC is continually increasing their capacity. They are developing a dedicated base near New Brighton Park in the Central Harbour of Burrard Inlet to consolidate their operations.

The CCG has a small cache of equipment and TWN has a container at Whey-ah-wichen with equipment and supplies to respond to recreational vessels spills at the Cates Park dock.

Table 6: WCMRC & CCG Cache

<i>Equipment</i>	<i>Type</i>	<i>WCMRC (~2018 at Burnaby Warehouse, Vancouver Harbour, & Delta Port)</i>	<i>CCG (~2021 at Kitsilano & Sea Island)</i>
Boom, General Purpose	24”	27,500’	
Boom, Shore Seal	24”	400’	5,500’

Boom, River	18"	800'	
Boom, Kepner Reel	40"-60"	8,500'	
Current Buster		1	2
Skimmer, portable		18	
Skimmer, vessel		5	
Storage, various		4,500 t	4t
Vessels	16' to 168'	22	5
Wildlife Response Trailer		1	

TWN Vessels & Equipment List (~2021, Whey-ah-wichen/Cates Park)

Vessel

- Landing Craft 28' 1

Safety & PPE

- Barrier Cream 1
- Cotton Work gloves 24
- Ear Plugs 96
- Handwipe Containers 8
- Nitrile Gloves L 36
- PDF Type V XXL 4
- Raingear XXL 10
- Safety Glasses 20
- Tyvec Chem Suits XXL 48

Boom & Supplies

- Canadyne Boom 18" 200'
- Low Drag Buoys 4
- Super Hooker Anchors w/line & chain 4

Sorbents

- Sorbent Pads 500
- Sorbent Boom 3" 400'
- Sorbent Sweep Rolls 4

Misc. Supplies

- Bulk Bags w/liner 3
- Cable Ties, Intermediate 200
- Caution Tape Rolls 6
- Drum 1
- Duct Tape Rolls 5
- Garbage Bags 50mm 40
- Mini Dripper Berm w/drain 1
- Pitch Forks 5
- Polypropylene Line 1/2" 600'
- Polysteel Line 1/2" 1,800'
- Rakes 4
- Shovels 3
- Tarp 30' x 50' 1
- Tool Bucket w/tools 2

7.0 TWN Responders & Training

It is important to TWN to establish a level of preparedness for marine pollution incidents that makes best use of limited resources. Our vessel and equipment cache described in Section 6 is necessary to support marine pollution response capacity. However, the cache is only useful if supported by a workforce (Table 7) trained and practiced (Tables 8 & 9) who understand TWN response and recovery objectives as described below.

Response & Recovery Objectives

Initial Response

- *Notification*—report marine pollution incidents to the CCG or EMBC, and to the TWN Initial Incident Commander, fully participate in inter-governmental coordination calls, and deploy field crews based on their training and competence, as needed

- *Safety Officer*—designate a lead to oversee the protection of human health, and the safety of responders, other employees, TWN community members, and Raven Woods residents

Establishment of an Incident Command Post

- Incident Command—fully participate at an Incident Command Post during any response on equal footing with federal and provincial partners, if established
 - Unified Command—fully participate in all aspects of decision-making, including setting priorities in all areas of response
 - Planning Section—fully participate in the Environmental Unit and on SCAT teams, and ensure TWN knowledge and science is incorporated into recommendations forwarded to Unified Command
 - Finance Section—implement administrative policies and procedures for TWN procurement

Use standard ICS forms and procedures to document all costs incurred to ensure full financial reimbursement from the Responsible Party or the federal Ship-Source Oil Pollution Fund

- Information Officer—designate a liaison between the TWN Chief & Council, community, and Unified Command to ensure ongoing two-way communication, and fully participate in joint messaging with Unified Command

Field Actions

- Pollution Sampling—implement procedures and contracts to sample and analyze pollutants to identify their type and source in a timely fashion
- Response Actions—ensure that response options selection and deployment incorporates TWN policies, procedures, priorities, and interests
- Protection of Cultural Heritage Sites—ensure all shoreline protection, assessment, and clean-up activities are conducted with minimal disturbance to archaeological or cultural heritage sites
- Protection of Environment—ensure all response activities include protective measures to reduce adverse environmental impacts
- GRS Implementation—direct WCMRC to TWN priorities for GRS implementation
- SCAT—observe or lead SCAT teams
- Wildlife—ensure that an appropriate wildlife response organization is hired to recover and rehabilitate injured wildlife, if needed

Post-Incident Recovery

1) Implement cost recovery procedures; 2) ensure remediation or restoration of any harm to the environment, cultural heritage, or community health; and 3) apply for compensation for any residual damage or additional study

Table 7: TWN Responder Roles

<i>Response Position</i>	<i>Minimum Staff</i>	<i>Responsibilities</i>
Initial Incident Commander	1	Upon notification of a marine pollution incident, liaise between TWN, CCG, BCMOE, WCMRC, VFPA, & Responsible Party
		During initial response, direct Safety Officer, Communications Officer, Response Supervisor, Basic Responders, & Archaeologist/arch monitors, as needed
		For a sustained response, coordinate with TWN, CCG, BCMOE, WCMRC, VFPA, Responsible Party, neighboring First Nations & municipalities, and health authorities to establish and staff an Incident Command Post
Unified Command Representative	1	Represent TWN in Unified Command (may be Initial Incident Commander) including advising on the selection and deployment of response options
		Concur on communication releases from JIC
		Approve clean-up end points & review achievement
Response Supervisor	1	Supervise & direct Basic Responders
		Oversee monitoring of response activities to prevent/limit damage to natural resources, the environment, & cultural heritage
		Oversee pollutant sampling
Vessel Operator	1	Operate vessels safely, as needed (may be Response Supervisor)
Basic Responder	3	Monitor response activities to prevent/limit damage to natural resources and the environment
		Collect pollutant samples
Archaeologist/ Arch Monitor	2	Monitor shoreline activities to prevent/limit damage to cultural heritage (Arch Monitor may be Response Supervisor/Basic Responder)
Environmental Unit Representative	2	Participate at Incident Command Post in Environmental Unit
		Identify at risk natural & cultural resources & locations of concern
		Propose clean-up end points
SCAT Team Leader	1	Lead TWN SCAT Team
		Assess achievement of clean-up end points
SCAT Team Member	2	Observe/participate on SCAT Teams
GIS Specialist	1	Support TWN SCAT Team mapping
TWN Information Officer	1	Participate on JIC Team at Incident Command Post
		Draft communications for Unified Command & TWN Chief & Council approval
Safety Officer	1	Protect health & safety of TWN responders, TWN employees, & TWN community members
		Protect health & safety of Raven Woods residents
		Monitor air quality at site of marine pollution incidents & curtail responder activity, if unsafe
Finance Section Representative	1	Ensure TWN time & expenses are accurately recorded and approved in every Incident Command Post "Incident Action Plan"
		Recoup response expenses from the Responsible Party or the federal Ship-source Oil Pollution Fund

Table 8: TWN Responder Training

<i>Response Position</i>	<i>ICS</i>	<i>Safety</i>	<i>Spill Response</i>	<i>Monitoring</i>
Initial Incident Commander	ICS I-100 ICS I 200 ICS I 300 ICS I-210	24-hour HAZWOPER	IMO OPRC Level 3 or CCG-ER MSROC	
Unified Command Representative	ICS I-100 ICS I 200 ICS I 300	24-hour HAZWOPER	IMO OPRC Level 3 or CCG-ER MSROC	
Response Supervisor	ICS I-100 ICS I 200 ICS I 300	40-hour HAZWOPER	IMO OPRC Level 2 or CCG-ER EMOST	Environmental Monitor Training
Vessel Operator		24-hour HAZWOPER TC SVOP	IMO OPRC Level 1 or CCG-ER FROST	
Basic Responder	ICS I-100 ICS I 200	24-hour HAZWOPER	IMO OPRC Level 1 or CCG-ER FROST	Environmental Monitor Training
Archaeologist/ Arch Monitor	ICS I-402			Arch Monitor Training
Environmental Unit Representative	ICS I-100 ICS I 200 ICS I 300 ICS I-349	24-hour HAZWOPER		SCAT Training
SCAT Team Leader	ICS I-100 ICS I 200 ICS I 300	40-hour HAZWOPER		SCAT Team Leader Training
SCAT Team Member	ICS I-100 ICS I 200 ICS I 300	40-hour HAZWOPER		SCAT Training
GIS Specialist	ICS I-402			
JIC Information Officer	ICS I-100 ICS I 200 ICS I 300			
Safety Officer	ICS I-100 ICS I 200 ICS I 300	40-hour HAZWOPER	IMO OPRC Level 3 or CCG-ER MSROC	
Finance Section Representative	ICS I-402			

Table 9: Training Description

<i>Course</i>	<i>Description</i>
<i>Incident Management Training</i>	
ICS Canada I-100 – Introduction to the Incident Command System	Half-day introductory course designed for entry level personnel assisting at an incident or event or working in support roles. Required before higher level ICS can be taken.
ICS Canada I-200 – Basic Incident Command System	Introduces how ICS is used to manage Single Resources and initial actions, designed for personnel who need to function under ICS during an incident. 2-day course for operational response. Must have ICS 100.
ICS Canada I-210 – Initial Response Incident Commander	This is a U.S. ICS course, but covers important concepts about initial response management and transition from first response to a larger-scale incident, management of smaller incidents. 1-2 day course, must have ICS 100-200 as prerequisite.
ICS Canada I-300 – Intermediate Incident Command System	Designed for individuals in supervisory roles or during expanded large scale incidents. 2.5-day course for IMT members. ICS 100-200 are prerequisites.
ICS Canada I-349 – Environmental Unit Leader	Focused on specific skills needed to act as EU Leader during spill. 2-day course, must have ICS 100-300 as prerequisite.
ICS Canada I-402 – Incident Command System for Executives	Provides basic understanding of ICS for executives who are responsible for establishing policy, but not typically part of the on-scene ICS organization. No prerequisites.
<i>Safety Training</i>	
24-hour HAZWOPER	Basic level of hazardous materials response operations for oil spill first responders. Developed to meet U.S. occupational health standards, but widely used in Canada. Can be taken in-person or online. 8-hour refresher required annually.
40-hour HAZWOPER	Higher level of hazardous materials response operations more appropriate for responders engaged in recovery operations or supervisory functions. Can be taken in-person or online. 8-hour refresher required annually.
TC SVOP Course	Stand-alone course that provides the knowledge and skills necessary to safely operate a small non-pleasure vessel in near coastal and sheltered waters under normal operating conditions, including darkness and restricted visibility
<i>Spill Response and Clean-up Operations</i>	
CCG-ER Essentials of Marine Oil Spill Response Training (EMOST)	Four-day training primarily designed for CCG-ER personnel but delivered to partner agencies on request. Covers boom deployment and oil recovery, media relations, HNS, alternative response, and shoreline clean-up.
CCG-ER First Response to Oil Spills Training (FROST)	Two-day training and information session developed for CCG and its partner agencies, coastal communities, Indigenous groups and industry, to enable them to safely respond to marine oil spills. Includes spill assessment and boom deployment.
CCG-ER Marine Spill Response Operations Course (MSROC)	Five-day course teaches basics for operational management of marine pollution response and how to select the best response strategies. Intended for individuals with a role in supervision of operational response to a marine pollution incident (e.g. on-scene commander for small spills, IMT member for larger spills).
IMO OPRC Level 1 (Operational Staff and First Responders)	IMO puts out model training courses. This one is designed for oil spill first responders, typically a 2-3 day course with a 3-year refresher.

IMO OPRC Level 2 (Supervisors and On-Scene Commanders)	IMO model training course designed for on-site coordinators who will lead or supervise oil spill response teams, typically a 3-4 day course with a 3-year refresher.
IMO OPRC Level 3 (Senior Management)	IMO model training course designed for senior managers, administrators, or senior officials who may be involved in planning for or managing spill response, typically a 4-5 day course with a 5-year refresher.
<i>Shoreline Assessment</i>	
SCAT Training	Training for participants in SCAT teams, a systematic method that responders use for surveying an affected shoreline after an oil spill. SCAT teams collect the data needed to develop a shoreline cleanup plan that maximizes the recovery of oiled habitats and resources, while minimizing the risk of injury from cleanup efforts. Most courses are 3-4 days, in person.
SCAT Team Leader Training	SCAT Team Leaders lead SCAT teams and have a higher level of training and experience. In the U.S., these positions are usually filled by professional responders (government or industry) who respond to spills in multiple jurisdictions. 2-3 day class.
Environmental Monitor Training	Standard training includes instruction on upland and aquatic habitat, water quality, and construction site monitoring, and includes testing on essential environmental skills.
Archaeology Monitor Training	Standard training focuses on the requirements, protocols, and safety issues associated with activities at archaeological sites including: 1) identification of different site types and features, 2) use of archaeological survey methods, and 3) use of survey equipment and proper notetaking.

8.0 Updated GAP Analysis & Recommendations

TWN Capacity Building Requests

<i>Objective</i>	<i>Status</i>
All government partners and industry respect TWN governance rights in Burrard Inlet and our territory.	Achieved informal recognition. Requires improvement
All government partners and industry reference and incorporate TWN policies into their spill response plans in Burrard Inlet and our territory.	Ongoing.
All government partners and industry accept full TWN participation in all aspects of spill planning, training, exercises, or response in Burrard Inlet.	Achieved.
The lead agency for any spill event shall ensure timely notification to TWN in the same timeframe as for all other governments.	Achieved, but requires improvement.
All government partners support development of a spill sampling policy and procedures for the early stages of spill response.	Unresolved.
All government partners work together to develop consensus endpoints for SCAT appropriate for heavily used, urban beaches found around Burrard Inlet.	No action.
The federal government financially support implementation of the joint Musqueam-Squamish-Tsleil-Waututh (MST)/Environment and Climate Change Canada Cumulative Effects Monitoring Initiative to establish baseline conditions.	Ongoing, but inadequate funding.
The federal government develop and implement a Canadian version of Natural Resources Damage Assessment.	No action.
All government partners support development of a framework to assess community health and cultural impacts of spilled oil.	No action.

TWN Requests for Immediate Support

<i>Objective</i>	<i>Status</i>
Fund and implement the Musqueam-Squamish-Tsleil-Waututh/Environment and Climate Change Canada Cumulative Effects Monitoring Initiative.	Ongoing, but inadequate funding.
Fund a new ½ time TWN oil spill coordinator.	Initial progress, but requires further development of internal TWN organizational structure.
Fund existing staff to participate in training, exercises, and testing related to oil spills.	Ongoing.
Develop, test, and deploy more protective GRS for Maplewood Flats and the whole of Indian Arm in conjunction with WCMRC.	Some action, but incomplete.
Fund development of a framework to assess community health and the cultural impacts of spilled oil.	No action. Also need to change Marine Liability Act to allow reimbursement of spill effects on community health.
Provide training, equipment, supplies, and support to allow TWN to implement GRS between Whey-ah-wichen and Maplewood Flats on the north shore of the Central Harbour.	No action.

Preparedness Gaps

<i>Objective</i>	<i>Status</i>
TWN actively participate in federal and provincial oil spill planning processes.	Ongoing.
TWN participate as a member of Unified Command in Burrard Inlet oil spill drills and exercises.	Achieved.
TWN conduct internal oil spill response exercises.	Initial progress, requires targeted plan and appropriate resources.
TWN ensure ICS training is provided to community members and staff.	Ongoing—have current field staff taken ICS 100-200 training? Has the oil spill lead taken ICS 100-300 training? Consider having council members, CAO, TLR director, and public works director take ICS 400. Consider having Inlailawatash field staff take ICS-100-200.
Develop capacity to monitor air quality on the main reserve.	No direct action, but did partner with Metro Vancouver to conduct air quality monitoring
Give annual or biannual presentation to WCMRC on TWN cultural heritage and its significance to oil spill preparedness and response.	No action.
Actively participate in WCMRC planning, training, and exercises.	Ongoing, but requires improved communication and direct participation in exercises.
Request access to industry oil spill contingency plans in Burrard Inlet.	No action.
Actively coordinate oil spill planning and preparedness with federal and provincial partners.	Ongoing.
Encourage development of provincial government plans for protecting archaeological sites.	Requested through EAO during consideration of impacts of marine shipping on TMX EAC. Decision expected late 2020, but no interest expressed on behalf of EAO.
Ensure that TWN staff are fully trained as responders, monitors, SCAT team members, safety officers, and information officers.	Ongoing.
Engage in outreach and education activities to ensure TWN policies are known and understood.	Ongoing.
Identify and prioritize sensitive areas for protection from oil spills and tie into GRS.	Achieved. Priorities include shoreline from Maplewood Flats to Whey-ah-Wichen and all of Indian Arm.
Work with WCMRC to develop appropriate protection/response techniques for use in GRS in TWN Consultation Area.	Incomplete.
Conduct on-water response drills to provide opportunity for TWN personnel to practice deploying containment or protective boom.	Small scale exercise conducted in 2019 using equipment in container at WAW. Need to work

Incorporate oil surrogate (e.g. peat moss) if feasible, to evaluate effectiveness of booming tactics under a range of conditions.	with WCMRC to practice GRS deployment exercise.
Identify community members and staff to participate in on-water oil spill response (protective booming) training.	No action. Consider training for EM/Arch monitors, and Inlailawatash field crew.
Seek funding to purchase oil spill response equipment that TWN responders could deploy as protective measures.	Achieved at basic level. Spill response container located at Whey-ah-Wichen. Develop plan to prioritize additional resources and locations.
Develop cooperative arrangements with WCMRC around equipment storage at Whey-ah-Wichen that provide TWN with access to equipment and/or compensation for storage.	Achieved.
Make participation in WCMRC and industry drills a higher priority for TWN field crews.	Ongoing. Need to address liability questions.
Develop long term monitoring program to develop baseline data that would inform incident monitoring in the event of an oil spill. This should include objectives for water, sediment, and tissue monitoring in Burrard Inlet.	Ongoing—cumulative effects program.
Create a cohesive oil spill sampling plan in collaboration with federal, provincial, and local governments and ensure that timely implementation of sampling is a priority for future oil spill response. Include data management planning and protocols.	No action. Requested through EAO during consideration of impacts of marine shipping on TMX EAC. Decision expected late 2020, but no interest expressed on behalf of EAO.
Promote the adoption of an ecological damage assessment process in BC (similar to NRDA).	No action.
Use TWN law to create a standard for holding polluters responsible for restoration that aligns with the TWN stewardship obligation.	No action.
Develop a process for assessing oil spill community impacts to TWN.	No action.
Establish safeguards to foster community resilience based in traditional/cultural ways and knowledge.	No action.
Coordinate with other jurisdictions (federal, provincial, port) to ensure oil spill compensation scheme is clear and enforcement mechanisms in place to ensure full compensation of all costs associated with an oil spill and the damages caused by it.	Did not get reimbursed for TWN M/V Marathassa expenses. Consider developing a contract template for the Responsible Party to sign when an ICP is established. Change Marine Liability Act and Ship-Source Oil Pollution Fund regulation to facilitate full reimbursement.

Other Priorities

<i>Objective</i>	<i>Status</i>
Train and educate TWN Health staff on air quality and human health risks from diluted bitumen spills.	Review with Health Department
Equip and train TWN staff to conduct air quality monitoring in immediate vicinity of a spill before deploying responders.	No action.
Develop emergency response and evacuation plan that specifies procedures and authorities for evacuating TWN community during oil spills that threaten public health and safety.	No action.
Formulate and articulate TWN position on oil spill response options in Burrard Inlet.	Policies in 2016 OSRP.
Create Appendix to OSRP with information on how each of the oil spill response/shoreline assessment and clean-up options can affect archaeological sites.	No action.
Participate in SCAT exercises in Burrard Inlet to practice coordinating with industry, federal, provincial, and local governments.	Ongoing.
Acquire “go-kits” for field sampling of spills and train TWN staff to use them.	No action.
Develop chain of custody procedures to support sampling plan, data management, and reporting.	No action.
Establish contracts with laboratories to provide analytical services for samples gathered during oil spill response, and ensure that sampling equipment and protocols align with laboratory standards.	No action.
Develop joint communications plans and templates with federal, provincial, and local government partners to facilitate the process of releasing timely information during oil spill.	Template in 2016 OSRP.
Work with federal, provincial, and local partners on the development of a Burrard Inlet volunteer coordination plan or program.	See GVIRP.
Identify volunteer functions that could be filled by TWN community members.	See GVIRP.