

From: [Zupan, Mike](#)  
To: [Enick, Oana V ENV:EX](#)  
Subject: Oil Spill response  
Date: Monday, April 13, 2015 1:39:51 PM  
Attachments: [IMG\\_0202.jpg](#)  
[Oiled rocks3.jpg](#)

---

Oana,

Attached is a picture of the site and the bagged rocks with the garbage cart in the background. This is located at our Manitoba Works Yard, 250 West 70<sup>th</sup> Avenue, Vancouver BC.

Regards

Mike Zupan

Manager - Sanitation Services

Engineering Services | City of Vancouver

Office 604-326-4706





**From:** [Zupan, Mike](#)  
**To:** [Enick, Oana V ENV:EX](#)  
**Cc:** ["Oana Enick s.22"](#); [Cole, Dennis](#)  
**Subject:** RE: Contact Details Please Oil Spill response  
**Date:** Monday, April 13, 2015 2:50:54 PM

---

I can give you the contact info. For today that would be **Dennis Cole, Superintendent and his phone number is 604-562-9084**. Dennis will be here until 8:30pm.

---

**From:** Enick, Oana V ENV:EX [<mailto:Oana.Enick@gov.bc.ca>]  
**Sent:** Monday, April 13, 2015 2:26 PM  
**To:** Zupan, Mike  
**Cc:** 'Oana Enick s.22'  
**Subject:** FW: Contact Details Please Oil Spill response

Hi Mike:

At some point I'm going to need the contact information where the bags and the bin can be picked up. That is, the name and phone number of the person who will actually be there, as well as the address. Thanks, Oana.

---

**From:** Enick, Oana V ENV:EX  
**Sent:** Monday, April 13, 2015 2:23 PM  
**To:** 'Zupan, Mike'  
**Subject:** RE: Oil Spill response  
Thanks Mike, Oana.  
Oana Enick  
Incident Waste Management Specialist  
Cell: 778-886-7935

---

**From:** Zupan, Mike [<mailto:mike.zupan@vancouver.ca>]  
**Sent:** Monday, April 13, 2015 1:40 PM  
**To:** Enick, Oana V ENV:EX  
**Subject:** Oil Spill response

Oana,

Attached is a picture of the site and the bagged rocks with the garbage cart in the background. This is located at our Manitoba Works Yard, 250 West 70<sup>th</sup> Avenue, Vancouver BC.

Regards

Mike Zupan

Manager - Sanitation Services

Engineering Services | City of Vancouver

Office 604-326-4706

**From:** [Zupan, Mike](#)  
**To:** [EOC Operations Chief](#); [Enick, Oana V ENV:EX](#)  
**Cc:** [EOC Ops 1](#); [EOC Planning Chief](#)  
**Subject:** RE: Update: Contaminated Waste Pick Up from Manitoba Yard  
**Date:** Monday, April 13, 2015 1:48:25 PM

---

Thanks Al. I have just finished a conversation with Oana and am waiting further direction. I'll follow up with the group on any new info.

Regards,

Mike Zupan

Manager - Sanitation Services

Engineering Services I City of Vancouver

Office 604-326-4706

---

**From:** EOC Operations Chief  
**Sent:** Monday, April 13, 2015 1:47 PM  
**To:** [Oana.Enick@gov.bc.ca](mailto:Oana.Enick@gov.bc.ca)  
**Cc:** Zupan, Mike; EOC Ops 1; EOC Planning Chief  
**Subject:** RE: Update: Contaminated Waste Pick Up from Manitoba Yard  
**Importance:** High

Hi Oana,

The City of Vancouver's EOC has left a few messages on your office voicemail with a request to have the contaminated waste picked up from our Manitoba yards. If you are on your blackberry, could you please follow up with Mike Zupan [s.22](#) on this or provide a contact # or person who's responsible for this where we at the EOC can follow up?

Thank you,

Al

Operations Section, Engineering

CoV Emergency Operations Centre

604-829-4485

---

**From:** EOC Ops 1  
**Sent:** Monday, April 13, 2015 09:55 AM  
**To:** EOC Operations Chief; Zupan, Mike  
**Cc:** Sidwell, Amy  
**Subject:** RE: Update: Contaminated Waste Pick Up from Manitoba Yard  
Have scanned the EOC, as well as checked with both Security Check Points.  
She has not checked in here so far today.  
Thanks  
Kirk

---

**From:** EOC Operations Chief  
**Sent:** Monday, April 13, 2015 9:38 AM  
**To:** Zupan, Mike  
**Cc:** Sidwell, Amy; EOC Ops 1  
**Subject:** Update: Contaminated Waste Pick Up from Manitoba Yard  
Good Morning Mike,

I followed up with Oona Erik via phone (**604.582.5270**) and wasn't able to get a hold of her this morning. I left a voicemail with your cell # to discuss this with you asap. If you hear back from her, please let me know to ensure we have closed the loop on this. I will also update you if I hear anything from her.

**Original Action Documents by ( CoV Ops Chief – Amy Sidwell (April 12))** -- Sanitation would like to have contaminated waste picked up from Manitoba Yard, Oona Enik is the contact for this (604.582.5270), Amy left a message with her yesterday and has forwarded her cell number to Sanitation

Thank you,

Clarence

**Operation Chief**

**City of Vancouver Emergency Operations Centre**

**Direct Phone: 604-829-4494**

**From:** [EOC Operations Chief](#)  
**To:** [Enick, Oana V ENV:EX](#)  
**Cc:** [Zupan, Mike](#); [EOC Ops 1](#); [EOC Planning Chief](#)  
**Subject:** RE: Update: Contaminated Waste Pick Up from Manitoba Yard  
**Date:** Monday, April 13, 2015 1:46:45 PM  
**Importance:** High

---

Hi Oana,

The City of Vancouver's EOC has left a few messages on your office voicemail with a request to have the contaminated waste picked up from our Manitoba yards. If you are on your blackberry, could you please follow up with Mike Zupan s.22 on this or provide a contact # or person who's responsible for this where we at the EOC can follow up?

Thank you,

Al

Operations Section, Engineering  
CoV Emergency Operations Centre  
604-829-4485

---

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**Sent:** Monday, April 13, 2015 09:55 AM  
**To:** EOC Operations Chief; Zupan, Mike  
**Cc:** Sidwell, Amy  
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Thank you,

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**Operation Chief**

**City of Vancouver Emergency Operations Centre**

**Direct Phone: 604-829-4494**

**From:** [EOC Operations Chief](#)  
**To:** [Enick, Oana V ENV:EX](#)  
**Subject:** RE: Update: Contaminated Waste Pick Up from Manitoba Yard  
**Date:** Monday, April 13, 2015 2:43:08 PM

---

Hi Oana,  
Thanks for your response. I'm taking this over from Clarence at the Vancouver EOC.  
Thanks, Al

---

**From:** Enick, Oana V ENV:EX [mailto:Oana.Enick@gov.bc.ca]  
**Sent:** Monday, April 13, 2015 2:21 PM  
**To:** EOC Operations Chief  
**Subject:** RE: Update: Contaminated Waste Pick Up from Manitoba Yard

Hi Al:

I'm working with Mike Zupan and Clarence Lai. I am the right person to contact, but I need to work through the EOC in Vancouver. Thanks, Oana.

Oana Enick  
Incident Waste Management Specialist  
Cell: 5.22

ph: (604) 582-5270 fax: (604) 584-9751

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**From:** EOC Operations Chief [mailto:EOC.OperationsChief@vancouver.ca]  
**Sent:** Monday, April 13, 2015 1:47 PM  
**To:** Enick, Oana V ENV:EX  
**Cc:** Zupan, Mike; EOC Ops 1; EOC Planning Chief  
**Subject:** RE: Update: Contaminated Waste Pick Up from Manitoba Yard  
**Importance:** High

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Thank you,

Al

Operations Section, Engineering  
CoV Emergency Operations Centre  
604-829-4485

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**Cc:** Sidwell, Amy  
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**Sent:** Monday, April 13, 2015 9:38 AM  
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Thank you,

Clarence

**Operation Chief**

**City of Vancouver Emergency Operations Centre**

**Direct Phone: 604-829-4494**

Page 001 to/à Page 241

Withheld pursuant to/removed as

Copyright

**From:** [Page, Nick](#)  
**To:** [Freyman, Liz ENV:EX](#)  
**Subject:** EMAP first draft  
**Date:** Monday, April 13, 2015 12:39:46 PM  
**Attachments:** [EMAP - first draft v1.docx](#)

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## **DRAFT STATEMENT OF WORK**

Environmental Monitoring and Assessment Plan for the MV  
Marathassa Oil Spill, English Bay

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## **1.0 Scope**

### **1.1 Objective**

An experienced contractor is required to develop a monitoring and assessment plan to measure the short and long-term potential ecological effects of the recent spill of oil by the MV Marathassa into English Bay on April 8, 2015. The contractor is also expected to undertake some components of the plan using their own staff or outside consultants. Development of the Plan will include direction and support from the Environmental Unit. The contractor will also retain outside technical experts recommended by the Environmental Unit.

### **1.2 Background on the Zalinski**

In September 2003, Canadian officials were alerted to the wreck's dangers when oil was discovered on the surface near the site. CCG received reports of oil pollution in the Grenville Channel approximately 88.5 kilometres south of Prince Rupert, B.C. Upon investigation, CCG discovered no obvious source of pollution.

A review of available historical records led investigators to believe that the wreck could be the *Brigadier General M.G. Zalinski*, which sank in that location on September 29, 1946, while en route from Seattle, Washington, to Whittier, Alaska, carrying a cargo that included lumber, food, mail, vehicles and munitions.

In October 2003, a remotely operated vehicle (ROV) survey identified the source of the oil pollution as a large overturned wreck resting on the slope of the channel at the mouth of Lowe Inlet.

Confirmation that the vessel was indeed the Zalinski was later received by the U.S. Government, who also provided a detailed cargo manifest. The Zalinski's identity was further confirmed by Canadian Navy divers who found markings on the ship's bell.

Over the last decade, several dives to the wreck site have been made to patch leaks and assess the condition of the Zalinski. During the last dive, it was determined that the Zalinski's condition has visibly deteriorated to the point that a more significant release of the Bunker C oil is probable. As such, preventive measures must be taken to eliminate this threat.

A number of surveys have been conducted on the Zalinski in order to gather information regarding its condition, position, accessibility, and risk posed by the munitions. This information, along with other related details, is being provided to bidders as part of the Request for Proposal bidding process. Based on the Zalinski's records the capacity of the fuel tanks was approximately 700 tons. Although the vessel drawings indicate the location of fuel tanks, it is believed that damage sustained to the Zalinski at the time of sinking and deterioration of the interior structure over time has resulted in migration of oil to elsewhere within the structure.

In addition to the Bunker C, the Zalinski contains a number of other pollutants, including, among other things, 39 drums of paint (exterior and interior), 492 drums of unleaded gasoline, 4 boxes (249 lbs.) of carbon tetrachloride, 25 drums of oil, 6 drums of lubricants and 1 box (68 lbs.) of turpentine. According to the cargo manifest, all of these other pollutants were stored within the #2 lower cargo hold of the Zalinski. This gives a combined maximum total of 800 tonnes of pollutants entombed in the wreck, assuming zero loss at the time of the sinking and zero consumption during the voyage.

## 2.0 Applicable Documents

As part of this Statement of Work (SOW), a series of supporting documentation is being provided to ensure that bidders have all the required information to develop an appropriate proposal and an effective workplan.

The list of supporting documentation is as follows:

1. Photo of the Zalinski (zalinski.jpg)
2. 1946 Vancouver Sun article - (articl1.jpg)
3. 1946 Vancouver Daily Province article – (articl2.jpg)
4. Mammoet presentation on Zalinski 2012 – (Sept 20, 2012 Mammoett Presentation to interdepartmental community.ppt)
5. Environment Canada spill modeling and trajectory for Grenville Channel / Lowe Inlet – (EC Trajectory Modelling.pdf)
6. CANUTEC assessment of Zalinski cargo manifest – (Cargo manifest risk analysis.docx)
7. Zalinski cargo manifest – (Zalinski Cargo Manifest – Exhibit H.pdf)
8. Svitzer Advanced Subsea Services Inspection dive video November 1 – 2007 – (VTS\_01\_1.VOB and VTS\_01\_2.VOB)

## 3.0 Requirements

### Pre and Post Operations Sampling Plans

The contractor must develop and implement a pre and post operations sampling plan. The pre-operations sampling plan must be conducted this calendar year (early August, 2013), prior to the commencement of any oil removal and pollutant assessment / mitigation operations on the Zalinski. Post operations sampling must be conducted once operations on the Zalinski have terminated, and 1 year thereafter.

### Study Zone

The study zone for this plan is the Grenville Channel, British-Columbia, area that may potentially be impacted by oil removal and pollutant assessment / mitigation operations on the Zalinski. The Environment Canada spill modeling and trajectory for Grenville Channel / Lowe Inlet (EC Trajectory Modelling.pdf) provides some information on areas that could potentially be impacted by a spill from the Zalinski.

### Pre and Post Operation Sampling Plan Considerations

1. The contractor's pre- and post-operations sampling plan must, as a minimum, include the following elements:
  - Study design
  - Sampling protocols
  - Sampling schedule

- Location of selected pre-operation baseline survey sites
  - Location of Control / Reference sites
  - Certified and standardized analysis protocols
  - List of accredited laboratories using certified and standardized analysis method that the contractors intend to use for carrying the analysis ([www.cala.ca](http://www.cala.ca)).
  - Data analysis methods
  - Quality Assurance and Quality Control measures put in place
2. The Contractor's Sampling Plan must be based on accepted, standard operating procedures such as American Society for Testing and Materials (ASTM), Environment Canada, US Environmental protection Agency, etc.
  3. The Contractor must be self-sufficient in their operation without requiring CCG, Environment Canada or other government departmental resources.
  4. The Contractor must permit representatives of Canada to accompany them in their vehicles for monitoring purposes during their field sampling campaign.

#### **Pre-Operations Sampling**

The goal of pre-operations sampling is to establish and obtain baseline datasets to measure any potential environmental negative impacts that may result from operations on the Zalinski. Sampling must be conducted prior to the oil removal operations on the Zalinski.

#### ***Sampling Site Characteristics and Requirements***

The contractor must select sampling sites in Grenville Channel for water, sediment and biota sampling. The number of sampling sites, locations and replicates per site must provide accurate pre-operation baseline environmental data to ensure any potential pollution impacts during the operation are measurable. The contractor's proposed sampling design must allow effects of operations actions to be discerned from natural variability and stochastic events. The selection of the baseline sampling sites must, as a minimum, be based on the following:

1. The sites must have a high likelihood of becoming contaminated in the event of a discharge from the Zalinski;
2. The sites should include all highly sensitive habitats / shoreline types that may experience the greatest environmental damage;
3. The sites must encompass the heterogeneity of sensitive habitats and shoreline types of the area at risk;
4. Each site needs to be representative of the specific sensitive habitat or shoreline type it is sampled for;
5. Sampling sites should be selected within 30 km north-west and 30 km south-east of the wreck along both shores of Grenville channel;



A preliminary analysis of Environment Canada's mapping data base indicates that the following shoreline types, sensitive habitats and socio-economic elements are in the 60 km area of interest along the Grenville shoreline channel:

#### Shoreline Types

- Bedrock cliff/vertical
- Bedrock platform
- Marine marsh/wetland
- Mixed sediment beach
- Mixed sediment flat
- Pebble / cobble beach
- Pebble / cobble flat
- Rock, sand and gravel beach
- Rock with gravel beach
- Rock with sand beach
- Sand beach
- Sand flat

#### Sensitive Habitats

- Shellfish area
- Provincial protected conservation area
- Marine park
- Kelp beds

#### Socio-economic

- First Nations
- Shellfish growing and harvesting sectors

Table 1: The following table depicts the shoreline types, sensitive habitats and socio-economic elements that should be considered for the baseline sampling sites. These are listed in order of priority. For information purposes, also listed below are shoreline types that do not require sampling.

<b>Shoreline types and sensitive marine habitats - 30 km radius around Zalinski</b>	<b>Sampling Yes \ No</b>
First Nations sites <sup>1</sup>	Y
Marine Marsh/Wetland	Y
Shellfish area	Y
Provincial Protected Conservation area	Y
Shellfish growing and harvesting sectors	Y
Marine Park	Y
Mixed Sediment Beach <sup>A</sup>	Y
Mixed sediment Flat <sup>A</sup>	Y
Pebble/Cobble Beach <sup>B</sup>	Y
Pebble/Cobble Flat <sup>B</sup>	Y

Sand Beach <sup>C</sup>	Y
Sand Flat <sup>C</sup>	Y
Bedrock Cliff/Vertical <sup>2</sup>	N
Bedrock Platform <sup>2</sup>	N
Rock, Sand and Gravel Beach <sup>2</sup>	N
Rock with Gravel Beach <sup>2</sup>	N
Rock with Sand Beach <sup>2</sup>	N

<sup>1</sup> Local First Nations community members should be consulted to identify any sites in the Grenville Channel area they feel should be included in the sampling study, above and beyond the requirements listed in this SOW.

<sup>2</sup> Although sampling at shoreline types such as bedrock cliff/ vertical, bedrock platform, rock, sand and gravel beach, rock with gravel beach and rock with sand beach is not required, visual observations at these sites shall be conducted to determine the presence of any hydrocarbons or other pollutants prior to and after operations. Any sites that are found to be contaminated should be documented in the sampling plan. Shoreline Cleanup and Assessment Technique (SCAT) is the method of preference.

A, B, & C: Shoreline types of same letter means that either one or the other shoreline type may be surveyed as they are considered to be similar enough for the sampling plan.

### **Sample Analysis**

Analysis must be carried out by accredited laboratories using certified and standardized analysis methods ([www.cala.ca](http://www.cala.ca)). Analysis of the samples taken at each site must be conducted for, but not necessarily be limited to, the following criteria:

- 1- Water quality (pH, hardness, conductivity, alkalinity and salinity)
- 2- Total petroleum hydrocarbon product C<sub>10</sub> – C<sub>50</sub>, and fingerprinting
- 3- Heavy metals
- 4- Mercury
- 5- Polychlorinated biphenyl (PCB's) and congeners
- 6- Polycyclic aromatic hydrocarbons (PAHs)

In addition, a study of the benthic invertebrate community (density, richness, evenness index and similarity index, etc.) as well as a study of biomarkers of pollution induced stress in shellfish (e.g. mussels) at each site must be conducted. At each sampling site a minimum of five (5) replicates (as listed below) must be collected.

<b>Analysis</b>	<b>Water</b>	<b>Sediments</b>	<b>Biota / Benthic Community</b>
Water quality (pH, hardness, conductivity, alkalinity and salinity)	Yes	No	NA
Total petroleum hydrocarbon product C <sub>10</sub> – C <sub>50</sub> mg/kg and fingerprinting.	Yes	Yes	NA
Heavy metal	Yes	Yes	NA
Mercury	No	Yes	No
PCB's and congeners	No	Yes	No
PAHs	No	Yes	No
Biodiversity / Biomass	NA	NA	Yes
Biomarkers of pollution	NA	NA	Yes

### ***Wreck Site Pollution Baseline Characterization***

Where safety and operational conditions permit, the contractor must assess for pollutants present at the wreck site. The contractor shall apply the same water and sediment, but not biota, analysis criteria at the wreck the site that it is using for other sites outlined in the sampling study.

A minimum of 5 samples each of water and sediment shall be obtained from a distance of at least 5 metres of the Zalinski. All precautions must be taken to ensure the safety of divers (if used) and technicians involved in sampling at the wreck site. Measures must also be taken to ensure that sampling operations do not in any way cause a release of oil from the Zalinski.

### **Post-Operations Sampling**

Initial post-operations sampling must be conducted once oil removal and pollutant assessment / mitigation operations have terminated (demobilization of all resources) and / or after any on-water or shoreline cleanup operations have terminated. Sampling must be conducted at:

- a. sites impacted by pollution;
- b. non-impacted baseline sites; and,
- c. reference sites surveyed prior to operations.

The specific schedule proposed shall consider biological cycle, seasonal changes and overall environmental trends in order to reduce confounding effects.

A final post-operations sampling must be carried out one (1) year after the initial post-operations sampling.

### **Project and Technical Authority**

The CCG is project authority for this project. Environment Canada is the technical authority and is responsible for liaising with the contractor during the conduct of this project and providing technical input, as required.

### **Deliverables**

1. The Contractor must deliver at least the following 3 reports :
  - a. A pre-operation report within 45 days of commencement of oil removal and pollutant assessment / mitigation operations on the Zalinski, but not less than 60 days after award of contract.
  - b. An early post-operation report no later than a month after reception of laboratory analysis from the 1<sup>st</sup> post-operation sampling campaign.
  - c. A final report no later than a month after reception of laboratory analysis from the final post-operation sampling campaign that occurs one year after oil removal and pollutant assessment / mitigation operations and / or cleanup activities have terminated.

2. The Contractor must provide a report delivery schedule.
3. The Contractor must provide a detailed table of content of the above reports before they are produce, for review and discussion with Environment Canada.
4. The Contractor must provide to the Technical Authority all raw data and lab analysis results as soon as they are made available to the contractor. Delivery may be done electronically. ( Note: The TA will forward to Environment Canada)

Note: The following Environment Canada reference documents have been provided to assist the contractor in preparing and developing the pre and post operation sampling plan. References may not be directly related to a hydrocarbon spill, but are nonetheless relevant.

- 1- Environment Canada. 2005. The inspector's field sampling manual, 2<sup>nd</sup> edition. Her Majesty the Queen in Right of Canada (Environment Canada) 2005. 270 pages
- 2- Environment Canada. 2012. Metal Mining Technical Guidance for Environmental Effects Monitoring. Her Majesty the Queen in Right of Canada. 550 pages
- 3- Environment Canada. 2002. Revised guidance for sample sorting and sub-sampling protocols for EEM benthic invertebrate community surveys. Ottawa (ON): Environment Canada, National EEM Office.

**Leclerc, Susan CSNR:EX**

---

**From:** Mayberry, Jennifer <Jennifer.Mayberry@vancouver.ca>  
**Sent:** Monday, April 13, 2015 10:38 AM  
**To:** XT:HLTH Taki, Richard  
**Cc:** XT:HLTH Lu, James; XT:HLTH Ash, Randy; Freyman, Liz ENV:EX  
**Subject:** Re: Analytical data - requirements

Hi Richard,

It's been confirmed since I sent this message that the CG sampling will be expedited for the beaches. Water and sediment samples to be collected for LEPH/HEPH (corrected for PAH), TOC also in sediments. No target levels set. I'd suggest you discuss further with Environmental Unit leader, Liz Freyman.

Jennifer

----- Original Message -----

**From:** Taki, Richard [VC] [<mailto:Richard.Taki@vch.ca>]  
**Sent:** Monday, April 13, 2015 09:58 AM Pacific Standard Time  
**To:** Mayberry, Jennifer  
**Cc:** Lu, James [RH] <[James.Lu@vch.ca](mailto:James.Lu@vch.ca)>; Ash, Randy [VC] <[Randy.Ash@vch.ca](mailto:Randy.Ash@vch.ca)>  
**Subject:** Re: Analytical data - requirements

Hi Jennifer

Could you advise us as to what parameters are being measured for in the samples and what target levels that may have been set.

Thanks

Richard

Sent from my BlackBerry 10 smartphone on the Rogers network.

Original Message

**From:** Mayberry, Jennifer  
**Sent:** Monday, April 13, 2015 9:10 AM  
**To:** Taki, Richard [VC]  
**Cc:** Page, Nick  
**Subject:** Analytical data - requirements

Hi Richard,

Please advise what data you'll require to determine beach openings. We'll be collecting water and sediment samples from Kits Beach, Second Beach, English Bay, and New Brighton. Need to determine which samples to rush.

Thanks,  
Jennifer

## Leclerc, Susan CSNR:EX

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**From:** Chiang, Eric <Eric.Chiang@dfo-mpo.gc.ca>  
**Sent:** Monday, April 13, 2015 9:03 AM  
**To:** John Konovsky; Page, Nick  
**Cc:** Freyman, Liz ENV:EX; Grant, Alex J ENV:EX; Mayberry, Jennifer; McPherson, Katie; paveyj@dnv.org; Lipsett, Kandis ENV:EX; Epps, Deb ENV:EX; Bridget Doyle; Lance Hunt; Ian Collings; graham.thomas@ec.gc.ca  
**Subject:** RE: Longer term Monitoring & Impact Assessment Plan - 9 am meeting on Monday

Hi all, we're running a little bit late. Please standby..  
Thanks,  
Eric

-----Original Message-----

From: John Konovsky [mailto:[jkonovsky@twnation.ca](mailto:jkonovsky@twnation.ca)]  
Sent: Sun 4/12/2015 16:37  
To: Page, Nick  
Cc: Freyman, Liz ENV:EX; Chiang, Eric; Grant, Alex J ENV:EX; Mayberry, Jennifer; McPherson, Katie; [paveyj@dnv.org](mailto:paveyj@dnv.org); Lipsett, Kandis ENV:EX; Epps, Deb ENV:EX; Bridget Doyle; Lance Hunt; Ian Collings  
Subject: Re: Longer term Monitoring & Impact Assessment Plan - 9 am meeting on Monday

Callin info

s.17

John Konovsky  
Tsleil-Waututh Nation  
604-353-2106

On Apr 12, 2015, at 16:28, Page, Nick wrote:

Just to confirm meeting at 9 am, Monday morning to discuss sediment sampling plan and other environmental monitoring components. Teranis will call in.

Nick

## Leclerc, Susan CSNR:EX

---

**From:** Chiang, Eric <Eric.Chiang@dfo-mpo.gc.ca>  
**Sent:** Monday, April 13, 2015 9:03 AM  
**To:** John Konovsky; Page, Nick  
**Cc:** Freyman, Liz ENV:EX; Grant, Alex J ENV:EX; Mayberry, Jennifer; McPherson, Katie; paveyj@dnv.org; Lipsett, Kandis ENV:EX; Epps, Deb ENV:EX; Bridget Doyle; Lance Hunt; Ian Collings; graham.thomas@ec.gc.ca  
**Subject:** RE: Longer term Monitoring & Impact Assessment Plan - 9 am meeting on Monday

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Thanks,  
Eric

-----Original Message-----

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Sent: Sun 4/12/2015 16:37  
To: Page, Nick  
Cc: Freyman, Liz ENV:EX; Chiang, Eric; Grant, Alex J ENV:EX; Mayberry, Jennifer; McPherson, Katie; paveyj@dnv.org; Lipsett, Kandis ENV:EX; Epps, Deb ENV:EX; Bridget Doyle; Lance Hunt; Ian Collings  
Subject: Re: Longer term Monitoring & Impact Assessment Plan - 9 am meeting on Monday

Callin info

s.17

John Konovsky  
Tsleil-Waututh Nation  
604-353-2106

On Apr 12, 2015, at 16:28, Page, Nick wrote:

Just to confirm meeting at 9 am, Monday morning to discuss sediment sampling plan and other environmental monitoring components. Teranis will call in.

Nick



**From:** [Page, Nick](#)  
**To:** [Chiang, Eric](#); [John Konovsky](#)  
**Cc:** [Freyman, Liz ENV:EX](#); [Grant, Alex J ENV:EX](#); [Mayberry, Jennifer](#); [McPherson, Katie](#); [paveyj@dnv.org](#); [Lipsett, Kandise ENV:EX](#); [Epps, Deb ENV:EX](#); [Bridget Doyle](#); [Lance Hunt](#); [Ian Collings](#); [graham.thomas@ec.gc.ca](#); [jlowry@cnv.org](#); [bonnie.antcliffe@dfo-mpo.gc.ca](#); [randallw.lewis@squamish.net](#); [Mayberry, Jennifer](#)  
**Subject:** Environmental Monitoring Plan - initial sediment and crab sampling plans  
**Date:** Monday, April 13, 2015 10:43:04 AM  
**Attachments:** [Environmental Monitoring Plan - initial crab sampling in English Bay \(first draft April 13\).docx](#)  
[Environmental Monitoring Plan - initial sediment sampling program \(final draft April 13\).docx](#)

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Current drafts:

Final draft of sediment sampling plan

First draft of crab sampling plan

## Environmental Monitoring Plan

### Initial Post-spill Crab Sampling Program for English Bay / Burrard Inlet

First draft April 13, 2015

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**Purpose:** Collect initial samples of Dungeness or rock crab at multiple sites in English Bay to characterize contaminant levels to assess human health concerns.

**Schedule:** Field sampling on Tuesday, April 13 or Wednesday, April 14, 2015.

**Sampler:** Sampling undertaken by staff of Teranis Consulting Ltd, or by DFO staff; capture using traps, intertidal zone, or collection from recreational fishers.

**Sampling Sites:** (2 in total)

- Site 1: Jericho Pier, Vancouver
- Site 2: Dundarave Pier or Ambleside, West Vancouver

**No. of Samples:** Four composite samples of 3 crabs each; 2 samples from each of 2 sites (Site 1 = Vancouver; Site 2 = West Vancouver).

**Sample Preparation:** split composite samples into hepatopancreas and muscle tissue; field preservation and storage to be added.

**Parameters for Analysis:** to be added by DFO

Sediment analysis: "LEPH (light extractable hydrocarbons); HEPH (heavy extractable hydrocarbons), PAHs (polycyclic aromatic hydrocarbons; CCME); HEPH and LEPH to be calculated based on CCME PAHs. Partitioning and storage of sample components will be discussed with Maxxam."

## **Environmental Monitoring Plan**

### **Initial Post-spill Sediment Sampling Program for English Bay / Burrard Inlet Shoreline Sites**

Final Draft April 13, 2015

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**Purpose:** Collect initial sediment samples at primary and secondary shoreline sites for analysis of hydrocarbon contamination.

**Schedule:** Field sampling on Tuesday, April 13 or Wednesday, April 14, 2015.

**Sampler:** Sampling undertaken by staff of Teranis Consulting Ltd.

**Sites:** Primary and secondary sites (8 in total)

#### Primary Sites (3)

- Sandy Cove, West Vancouver
- South of Siwash Rock (Stanley Park)
- North end of English Bay

#### Secondary Sites (5)

- Ambleside beach
- New Brighton Park
- West of Brockton Pt
- Kits Beach
- Lionsgate (east side of bridge)

#### References Sites

- Not identified at this time
- To be sampled in future; not part of Teranis contract at this time

**No. of Samples:** 3 to 6 samples per site of shallow, surficial fine sediment (upper 5 cm) per site; each consisting of composite samples of a total volume of 500 ml (to confirm with lab) collected at a minimum of 10 patches within the sampling site.

Total number of samples: 8 sites x 3 to 6 composite replicates = maximum of 48 samples

Specific sampling locations to be located in higher intertidal under of direction of City of Vancouver or North Vancouver staff.

**Parameters for Analysis:** LEPH (light extractable hydrocarbons); HEPH (heavy extractable hydrocarbons), PAHs (polycyclic aromatic hydrocarbons; CCME); HEPH and LEPH to be

calculated based on CCME PAHs. Partitioning and storage of sample components will be discussed with Maxxam.

## Niemi, Laurel ENV:EX

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**From:** Mayberry, Jennifer <Jennifer.Mayberry@vancouver.ca>  
**Sent:** Sunday, April 12, 2015 11:06 AM  
**To:** Freyman, Liz ENV:EX; 'paveyj@dnv.org'  
**Subject:** Fw: Draft environmental monitoring plan v2  
**Attachments:** Environmental Monitoring Plan (initial steps) v2.xlsx

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**From:** Chiang, Eric [<mailto:Eric.Chiang@dfo-mpo.gc.ca>]  
**Sent:** Saturday, April 11, 2015 06:36 PM Pacific Standard Time  
**To:** Page, Nick; [jkonovsky@twonation.ca](mailto:jkonovsky@twonation.ca)  
**Cc:** [gchallenger@polarisappliedsciences.com](mailto:gchallenger@polarisappliedsciences.com) ; [alex.grant@gov.bc.ca](mailto:alex.grant@gov.bc.ca) ; Mayberry, Jennifer; McPherson, Katie  
**Subject:** RE: Draft environmental monitoring plan v2

Graham, here's our preliminary sampling plan for next few days.

The plan was designed to characterize all media (water/sediment/sed pore water) and routes of exposure to receptors of concern. This is the first step and we will need to engage in setting up the longer term, comprehensive monitoring plan. I propose Polaris to be engaged with a good consultant to undertake that work, while all parties (cities, BC, DFO,EC) provide technical advice.

Currently, Coast Guard has tasked a consultant (Teranis) to undertake water (surface and water column) sampling tomorrow, followed by intertidal sediment sampling at various sites around the harbour, targeting visibly impact sites, not-visibly impact sites, and sites of special concern (e.g. surf smelt sites). It had been proposed that 12 sediment samples per site by Teranis during a conversation yesterday. The primary rationale seems to be to capture any potential impact gradient. However I was not involved in that initial conversation so this rationale is 2<sup>nd</sup> hand information. Regardless, I feel it may be excessive and resources are better spent on expanding site rather than 12 samples per site so would like to have a bit more discussion on it.

Your input welcome.

John – can you point out which sites are surf smelt sites again?

All – Feel free to input.

Thanks,

Eric

Eric Chiang

Fisheries Protection Biologist  
FCSAP Expert Support

Fisheries Protection Program  
Ecosystem Management Branch  
Fisheries and Oceans Canada, Pacific Region

1320 - 401 Burrard Street  
Vancouver, BC V6C 3S4  
Tel (604) 666-0017  
Fax (604) 666-0417

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**From:** Page, Nick [<mailto:Nick.Page@vancouver.ca>]

**Sent:** April-11-15 4:48 PM

**To:** [jkonovsky@twonation.ca](mailto:jkonovsky@twonation.ca)

**Cc:** [gchallenger@polarisappliedsciences.com](mailto:gchallenger@polarisappliedsciences.com); Chiang, Eric; [alex.grant@gov.bc.ca](mailto:alex.grant@gov.bc.ca); Mayberry, Jennifer; McPherson, Katie

**Subject:** Draft environmental monitoring plan v2

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**From:** Page, Nick

**Sent:** Saturday, April 11, 2015 4:45 PM

**To:** [jkonovsky@twonation.ca](mailto:jkonovsky@twonation.ca)

**Cc:** [gchallenger@polarisappliedsciences.com](mailto:gchallenger@polarisappliedsciences.com); [eric.chiang@dfo-mpo.gc.ca](mailto:eric.chiang@dfo-mpo.gc.ca); [alex.grant@gov.bc.ca](mailto:alex.grant@gov.bc.ca); Mayberry, Jennifer; McPherson, Katie

**Subject:** Draft environmental monitoring plan

## Draft Environmental Monitoring Plan (v2)

Task	Site
<b>Study scoping and design</b>	Study area
Define study objectives	Study area
Development protocols (locations)	Study area
Integrate with other components of impact assessment	Study area
Complete monitoring plan	Study area
<b>Ephemeral Sampling (April 12 and 13)</b>	
Source Oil	Collect at spill site
Water	Collect at spill site; Siwash Rock, Sandy Cove, north end of English Bay
Sediment	<u>Primary Sites:</u> 1. Sandy Cove; 2. south of Siwash; 3. north end of English Bay  <u>Secondary Sites:</u> 4. Ambleside, 5. New Brighton Park; 6. west of Brockton Pt; 7. Kits shoreline
<b>Short-term Sampling (April 13 to 24)</b>	
Weathered hydrocarbon samples	Primary sites
Biota - crabs	Primary sites only?
Biota - mussels	Primary sites only?
Biota - clams	Primary sites only?
Biota - forage fish egg mortality	Sandy Cove, Ambleside?, (Ramona to identify)
Pore Water	<u>Primary Sites:</u> 1. Sandy Cove; 2. south of Siwash; 3. north end of English Bay
<b>Long-term Sampling (April to &gt;&gt;)</b>	
Subtidal - sediment and/or biota	Vicinity of spill
Biota - crabs, flounders, others	Undefined; primary sites
Wildlife	Undefined
Others?	

Lead Agency	Timeline	Complete
RP		No
RP		
RP		
RP		
RP		
TC	Collected April 9 (confirm date)	Completed
CCS (vessel); assistance by Teranis	Sunday, April 12	No
Teranis	Monday, April 13 or Tuesday, April 14	No
Teranis?	Not scheduled; April 13 to 23	No
Teranis?	Not scheduled; April 13 to 24	No
Teranis?	Not scheduled; April 13 to 25	No
Teranis?	Not scheduled; April 13 to 26	No
Ramona de Graff	Not scheduled; April 13 to 27	No
Teranis?	Not scheduled; April 13 to 27	No
RP?	Undefined	No
DFO?, RP?	Undefined	No
Focus Wildlife	Undefined	No



Comments

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At least samples per  
site

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## **Environmental Monitoring Plan**

### **Post-spill Sediment Sampling Program for English Bay / Burrard Inlet Shoreline Sites**

April 12, 2014

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**Purpose:** Collect initial sediment samples at primary and secondary shoreline sites for analysis of hydrocarbon contamination.

**Schedule:** Field sampling on Tuesday, April 13 or Wednesday, April 14, 2015.

**Sampler:** Sampling undertaken by staff of Teranis Consulting Ltd.

**Sites:** Primary and secondary sites (7 in total)

#### Primary Sites (3)

- Sandy Cove, West Vancouver
- South of Siwash Rock (Stanley Park)
- North end of English Bay

#### Secondary Sites (4)

- Ambleside beach
- New Brighton Park
- West of Brockton Pt
- Kits Beach

**No. of Samples:** 6 samples per site of shallow, surficial fine sediment (upper 5 cm) per site; each consisting of composite samples of a total volume of 500 ml collected at a minimum of 10 patches within the sampling site.

Total number of samples: 7 sites x 6 composite replicates = 42

Specific sampling locations to be located in higher intertidal under of direction of City of Vancouver or North Vancouver staff.

**Parameters for Analysis:** LEPH (light extractable hydrocarbons); HEPH (heavy extractable hydrocarbons, PAHs (polyaromatic hydrocarbons). Analysis to CSR and CCME standards.

## Niemi, Laurel ENV:EX

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**From:** Page, Nick <Nick.Page@vancouver.ca>  
**Sent:** Sunday, April 12, 2015 12:45 PM  
**To:** jkonovsky@twonation.ca  
**Cc:** gchallenger@polarisappliedsciences.com; eric.chiang@dfo-mpo.gc.ca; Grant, Alex J ENV:EX; Mayberry, Jennifer; McPherson, Katie; Freyman, Liz ENV:EX; paveyj@dnv.org; Lipsett, Kandis ENV:EX  
**Subject:** Sediment sampling plan  
**Attachments:** Environmental Monitoring Plan - initial sediment sampling program (April 12).docx

## Niemi, Laurel ENV:EX

---

**From:** Page, Nick <Nick.Page@vancouver.ca>  
**Sent:** Sunday, April 12, 2015 12:45 PM  
**To:** jkonovsky@twonation.ca  
**Cc:** gchallenger@polarisappliedsciences.com; eric.chiang@dfo-mpo.gc.ca; Grant, Alex J ENV:EX; Mayberry, Jennifer; McPherson, Katie; Freyman, Liz ENV:EX; paveyj@dnv.org; Lipsett, Kandis ENV:EX  
**Subject:** Sediment sampling plan  
**Attachments:** Environmental Monitoring Plan - initial sediment sampling program (April 12).docx

## **Environmental Monitoring Plan**

### **Post-spill Sediment Sampling Program for English Bay / Burrard Inlet Shoreline Sites**

April 12, 2014

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