Application of a Risk Based Strategy during the Assessment of Small Craft Harbour Sites in British Columbia

Presented by: David Kettlewell, M.Sc., P.Geo., CSAP
Meredith Guest, P.Eng.
Presentation Outline

1. Small Craft Harbours – An Overview
2. Risk Based Strategy (RBS) – What Is It?
3. Application to SCH Sites
4. Conclusions

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SMALL CRAFT HARBOURS
An Overview
**Small Craft Harbours - General**

- Regional SCH Program is responsible for providing a network of harbours to provide commercial fish harvesters and other harbour users with safe and accessible facilities.
- Mandate to keep the harbours that are critical to the fishing industry open and in good repair.
- ~160 Small Craft Harbour (SCH) sites in Pacific Region.
- Regional Office of Environmental Coordination is responsible for assessment / management of contaminated sites for F&OC.
**Challenges with Small Craft Harbour Sites**

- Remote location of many of the sites
- Presence of a water lot and the potential for contaminated marine sediments
- Uncertain and/or complex site usage history
- Frequent occurrence of fill in the uplands
- Many different users

- Often located adjacent to other off-site contamination sources (ferry terminals / bulk plants)
- Complex administrative and legal context (e.g. in some sites, both the federal and provincial contaminated sites approaches apply)
RISK BASED STRATEGY

What Is It?
RATIONALE

- Remediation of contaminated sediments is challenging
- Risk assessment provides a cost-effective approach
- Provides a framework for assessment, remediation and risk management
- Allows for prioritization of sites
- Support other administrative or operational requirements
GOALS

- Guide initial assessment through to the final decision making process
- To be efficient and proactive in the investigation and management of environmental contaminants at SCHs
- Provide a scientifically defensible approach to allocating limited resources
- Leverage the contaminated sites investment to support the needs of other groups
- Reduce the uncertainty related to contamination issues
- Encourages the involvement of various stakeholders (ex. local harbour management)
- Meet both federal & provincial contaminated sites requirements
RISK BASED STRATEGY

Phase I
- No APECs (no action)
- Environmental Management Plan (Operational APECs)
- Biophysical Data Input

Phase II
- No Contamination (no action)

Phase III
- Risk Management (Relative Priorities – Management Objectives)
- Risk Assessment Risk Management (Relative Priorities – Risk Attributes)
APPLICATION TO SCH SITES
SCH Sites

- Degnan Bay
- Steveston
- Fulford Harbour
- Tsehum Harbour
- False Creek

Map showing locations around Vancouver, with markers for Degnan Bay, Steveston, Fulford Harbour, and Tsehum Harbour.
PRIMARY POINTS - UPLAND

i. Use of SCH-specific Tier 3 guidelines that include a 10 fold attenuation applied to water quality guidelines to protect aquatic life

ii. Approaches for addressing the use of drinking water quality criteria when assessing groundwater on SCH sites
PRIMARY POINTS - UPLAND
Primary Points - Sediment

iii. Use of the provincial sediment quality criteria as the primary criteria in determining whether sediments at SCHs are considered contaminated or not

- Consistency among the SCH Sites
- BC MOE identifies harbours as “typical sites”
- BC MOE criteria used to define whether sediment is “contaminated”
- CCME guidelines still required for FCSAP scoring
PRIMARY POINTS - SEDIMENT

iv. Recognition of operational contaminants at SCH sites

- PAHs from creosote piles
- Zinc from galvanized structures
- CCA from treated timbers
- Fuel storage and handling
v. Collection of sufficient background samples to provide appropriate background comparison for potential contaminants

- Parameters without regulatory criteria, 5X background applied

vi. Collection of sediment and tissue chemistry data to characterize local reference conditions
PRIMARY POINTS - SEDIMENT
Primary Points - Sediment

vii. Organotins identified as key contaminant of concern

- Use of EPA screening as provincial and federal numeric environmental quality criteria in sediment or porewater do not exist
- Exceedances carried forward for further risk assessment
viii. Sediment coring in a depositional environment where there is a historic source of contamination to assess for buried hotspots

- Biophysical Assessment
  Coastal & Ocean Resources Inc., Sidney, BC
PRIMARY POINTS - SEDIMENT
PRIMARY POINTS - MANAGEMENT

ix. Development of liability and costing models for the risk management of contaminated sites

x. Preparation of a checklist for immediate risk management priorities
xi. Advantageous collection of other useful data during the assessment including orthorectified current and historical aerial photographs, bathymetry, biophysical data, biological and cultural resources, and potential impacts from sewage discharges

- Areas of environmental concern evaluated using an Exposure Pathway Screening process
CONCLUSIONS
CONCLUSIONS

- Screening identified AECs for priority (boat grids, fuel supply)
- Significant variance in assessment conclusions when applying non-traditional approach to data / criteria evaluation
- Bathymetry and biophysical data / orthorectified historical aerial photographs key to understand site dynamics
- Operational considerations necessary and important. Many of these SCH sites are active and will continue to be in the future