9th ANNUAL
GENERAL MEETING & PD Workshop

June 8, 2016

CSAP
Society of Contaminated
Sites Approved Professionals
of British Columbia

Welcome to the Ninth Annual General Meeting

Robin Jones, President

Review of the AGM AGENDA

1. Housekeeping activities
2. Reports from the Directors
3. Approval of the Financial Statements
4. Appointment of the Auditors
5. Election of Directors representing Parent Organizations
6. New Business
7. Introduction of new Directors
8. Thank you to retiring Directors
9. AGM closing

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CSAP Ninth Annual General Meeting

Robin Jones, President

1.1 Appointment of the Meeting Secretary ✔

1.2 AGM Notice (Attachment 1) ✔

1.3 Declaration that a meeting quorum is present ✔

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2. Reports from the Directors

2.1 Committee Reports

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MEMBERSHIP COMMITTEE

Chair:	**Scott Steer,** MET, R.P.Bio, Director	
Members:	**Brant Dorman,** P.Eng.	**Jay Rao, M.Sc.,** P.Eng.
	Vijay Kallur, M.Sc., P.Eng.	**Sam Reimer,** P.Ag.
	Laura Koch, P.Ag.	

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Mandate

- Administer the membership application and examination process
- Verify that existing members maintain their qualifications

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Year in Review

- Review and Enhancement of Credentialing Process
  - Candidates must have experience with CSAP submissions
  - Financial compensation for experience reviewers
  - Increased use of interviews to vet candidates
- Changes to On-Leave Rules
  - Renewal date does not change regardless of length of leave
  - New Leave of Absence application form

Year in Review

- New exam software provider - On-Track Corporate Training Ltd.
- New psychometric consultant - Dallie Sandilands
- Thanks to our exam development teams!
- Thanks to the exam development team leads!
  - Sam Reimer (Risk); Paul Webb (Regulatory); Patty Carmichael (Numeric)

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Statistics

- 107 APs (88 numerical standards APs; 15 risk-based standards APs; and 4 APs who are both) at December 31, 2015
- 40 members successfully renewed at December 31, 2015
- 1 valued member resigned – Bill Donald

Welcome to our New Members!

- Jason Christensen, P.Eng.
- Anthony Collett, P.Geo.
- Kelly Forseth, P.Eng.
- Takako Matsueda, P.Eng.
- Kevin Wong, P.Eng.

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PERFORMANCE ASSESSMENT COMMITTEE

Chair:	**Reidar Zapf-Gilje,** Ph.D., P.Eng., Director	
Members:	**Colin Dunwoody,** P.Eng.	**Duncan MacDonald,** B.Sc., P.Eng.
	Michael Geraghty, M.Sc., P.Geo.	**Tara Siemens Kennedy,** MET, P.Chem.
	Eva Gerencher, M.Sc., P.Ag.	

PERFORMANCE ASSESSMENTS 2015-16

Performance Assessments conducted	16
Sufficient with Clarification	10
In Progress	5
Deficient	1

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Performance Assessment Timeline

Selected for PA	Completed < 1 month	Completed 1-2 months	Completed > 2 months	In Progress
16	54%	38%	8%	38%

Note: Approved Professional Response time and Ministry of Environment time to release instruments not included

AP response time to Stage 1 days in 2015 (business days)	
Average	46
Minimum	13
Maximum	145

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Update CSAP Practice Guidelines

- **Updated CSAP Practice Guidelines** posted to the CSAP website: https://csapsociety.bc.ca/members/practice-guidelines/
  - Excel spreadsheets for each report type
  - Recommend APs use spreadsheets for their review
  - PA panel members may refer to these for future PAs

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2015 – 2016 PAC Initiatives

- Updating the Annotated Summary of Site Conditions
- Preparing training Webinars for Performance Assessment Panel Members
- Updating the “Lessons Learned” database
  - Searchable by topics and keywords
  - Includes major issues raised in PA’s and how they were resolved
  - Prepared by PA Panel Members and the Delegated Member

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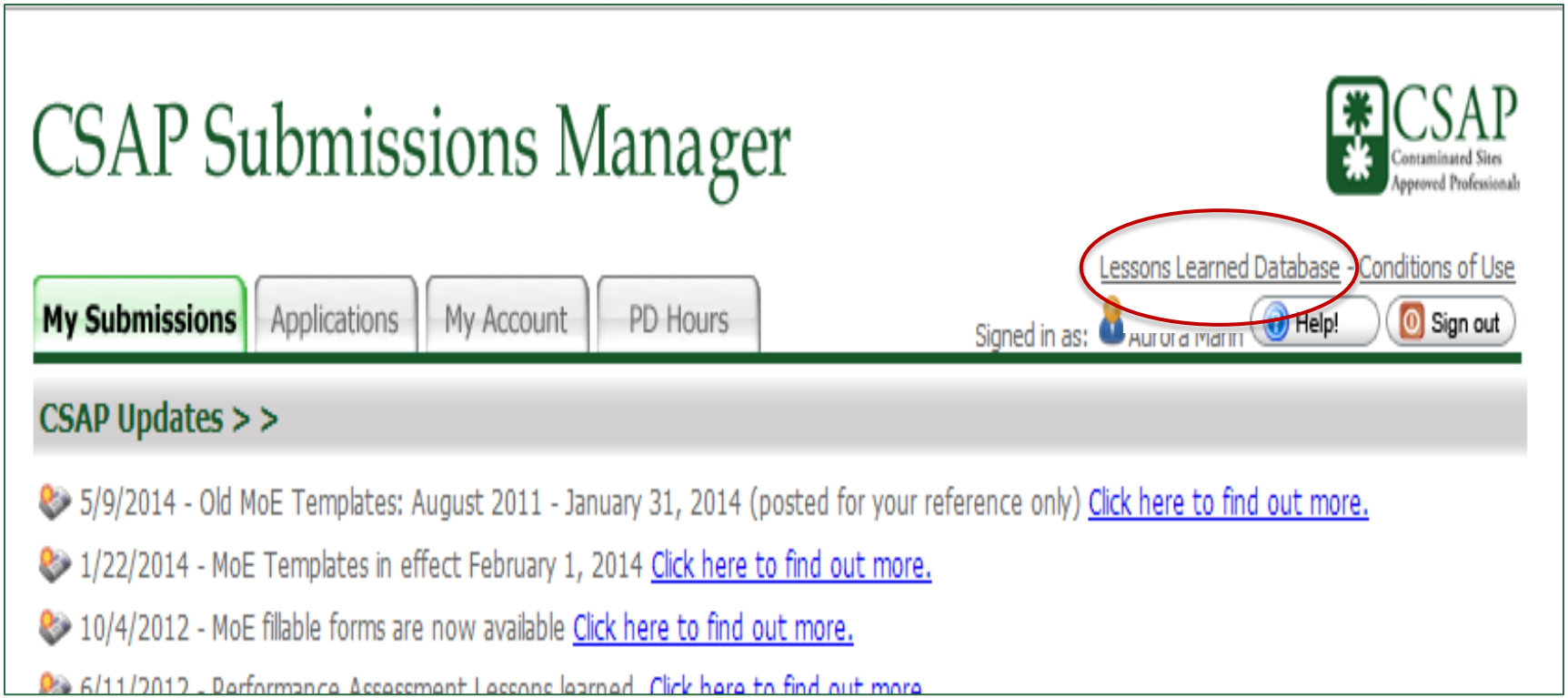
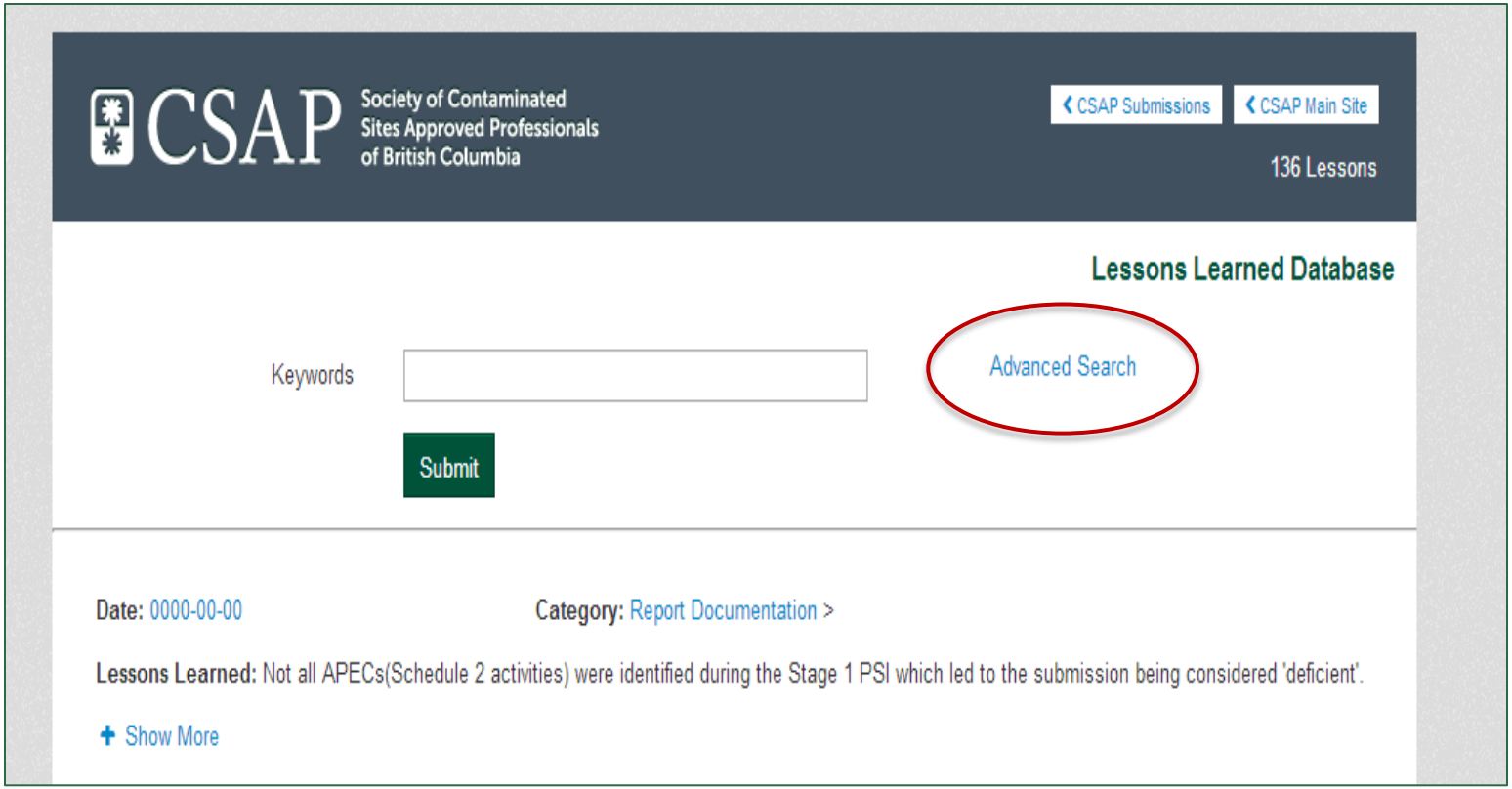
PA Lessons Learned Database

PA Lessons Learned Database



PA Lessons Learned Database



PA Lessons Learned Database

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CSAP Submissions | CSAP Main Site

136 Lessons

Lessons Learned Database

Keywords | Basic Search

Category: Category

Subcategory: Subcategory

Date: From: To: (YYYY-MM-DD)

Submit

Date: 0000-00-00 **Category:** Report Documentation >

Lessons Learned: Not all APECs(Schedule 2 activities) were identified during the Stage 1 PSI which led to the submission being considered 'deficient'.

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New Ministry requirements

Until a new cover letter template is issued, the following notice should be included in the draft cover letter:

> *Please note that the attached <legal instrument> does not address obligations of employers regarding worker health and safety under the Workers Compensation Act and Occupational Health and Safety Regulation. Development of site-specific work procedures in accordance with Workers' Compensation Board regulations may be warranted. Please direct related questions to Worksafe BC.*

Details regarding this policy will be reflected in future versions of CSR vapour intrusion guidance (*Technical Guidance 4*).

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New Ministry requirements

- AG11 Communication Records now should be listed as a separate report in Sch. D of draft instrument.
- Lab reports are no longer required as card copies, pdf is sufficient.

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New Initiatives

- Proposal for CSAP to take over the processing of instrument amendments

- Types of amendments expected to involve a range of scenarios
  - Correction of simple typographical errors
  - Change of site boundaries
  - Change of conditions in a Certificate
  - Change of applicable standards

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New Initiatives

- Review of the use of professional judgment and how it should be documented - see questions on the Members Survey

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Submission Detailed Screening

Detailed Screening comments by Bob Symington

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Detailed Screening Update

- New Detailed Screeners added
- Screening timelines
- Common screening issues
- AG11 communications template
- Detailed Screening feedback

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New Detailed Screeners added

- Due to workload and conflicts the Detailed Screening roster has been expanded
- 5 new screeners have been appointed and were selected from the current Panel members
- A webinar for the new screeners was provided

Screening Timelines

Preliminary Administrative Screening	Full business days
1 instrument	3
2+ instruments	4
Detailed Administrative Screening	
1 instrument	5
2 instruments	6
3-4 instruments	7
5+ instruments	8

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Detailed Screening Performance

Submissions Screened	<5 Days	5-10 Days	>10 days
100	28%	51%	21%

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Common Screening Issues

- Substance lists (Instrument vs. SoSC)
- Drinking water does not apply (P21)
- Site plans (Pr12)
- Pre-approval was required (P6)
- AG11 communications (AG11)

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AG11 Communications Template

- CSAP worked with MoE to develop an AG11 communications template
- The template is now posted to the submissions page of the CSAP website

  http://csapsociety.bc.ca/members/make-a-submission/
- This is a template only and does not replace MoE regulation

Detailed Screening Feedback

- A feedback form has been developed for the screening process
- It will be distributed by CSAP during the screening process
- Please take the time to provide feedback and, where possible, positive suggestions to improve the process

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TECHNICAL REVIEW

Chair:	**Peter Reid, M.B.A., M. Eng., P. Eng., Director**	
Members:	**Trish Miller,** M.Sc., R.P.Bio.	**John Taylor,** P. Eng.
	Jerry Naus, P. Eng.	**Dave Williams,** Ph. D., P. Eng.
	Guy Patrick, M.Sc., P. Eng.	

Responsibilities

- We Manage:
  - The Tech Review Process
  - CSAP Research Funding Process
  - CSAP Scholarship Program
- Committee Make Up:
  - Standards Reviewers
  - Risk Reviewers

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Technical Reviews Completed 2015/16

The Tech Review Committee completed the following last year:

- Omnibus Discussion Paper Review. – MOE Web Site
  - Schedule 4
  - Schedule 5
  - Schedule 6
  - Schedule 7
  - Schedule 9
  - Schedule 10
  - Schedule 11
  - Carcinogenic
  - Two Tiered Wildland

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Technical Reviews Completed 2015/16

The Tech Review Committee completed the following last year (continuation):

- Review of Toxicological Information used for the Omnibus derivations. - Confidential
- Review of Like Organizations. – CSAP External Jurisdiction Review- CSAP Web Site: http://csapsociety.bc.ca/members/professional-development/technical-studies/

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Special Projects

- Risk Management Decision Framework, Azimuth Consulting - Final Edits
- Toolkit for Risk Management, Golder Associates – Final Edits
- Geo Information System, upkeep and upgrades – Available all platforms
- TG4 – Review and final updates to new version
  - Parkade Attenuation adjustment
  - Groundwater contact foundation
  - Lateral attenuation
  - Biodegradation

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Special Projects

- Guidelines for PVPs
  - Taking PVPs submitted to date and providing updated advice on what is acceptable
- Applicable Standards for Peat
  - Is it soil or water – how should we deal with it.
- Mapping DW Exempt Areas
  - Like all Preapprovals are in one spot
  - Attempt to get all maps in layers in one spot.
- Leachate Methods
  - Evaluated leachate test methodologies to see if there is a more representative test.

Scholarship Review

Four Scholarships Awarded.

More information will be supplied later

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Practice Guidelines

CSAP Stage I PSI and Stage II PSI/DSI have received minimal edits and are in the process of being adopted by the MOE as new:

- TG10
- TG11

Risk Assessment under peer review.

Checklists designed to document review process.

Only have to submit showing it was done, not the details of the process.

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Embrace Diversity – Professional Judgement

- Parent Organizations / Designations:
  - P.Eng.
  - P.Geo.
  - R.P.Bio.
  - P.Ag.
  - P.Chem.
- Very diverse set of individuals. Some will have special skills in certain areas.

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Embrace Diversity – Professional Judgement

- Recognize that others will have more formal training than you do in certain areas and will be able to execute different degrees of professional judgement.

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Technical Activities

- We welcome your input and feedback!
- Members Survey – TRC questions
  - If you have a technical or research topic that you think we should pursue, please let us know!!
  - If you are interested in the TRC please let us know what your area of expertise is.

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PROFESSIONAL DEVELOPMENT SUB-COMMITTEE

Chair:	**Andrew Sorensen,** P.Eng., Director	
Members:	**Laura Koch,** P.Ag.	**Bob Symington,** P.Geo.
	Michael Rankin, R.P.Bio.	**Jason Wilkins,** P.Ag

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Roles of PD Sub Committee

- Assist in development of content and themes for the November 2016 Fall PD Workshop
  - *There is still time to recommend a presentation!*
- Assist with the development of Webinars and POD posts
- This year, assist with Development of Technical Stream Content for Ministry's Land Remediation Conference in September 2016
- Managing Updates to CSAP Submission Manager

CSAP Webinars

One webinar presented in 2015-16:
Performance Assessment and Detailed Screening Lessons Learned, 44 computers attended

- Likely to an annual topic

Additional webinars planned and topic suggestions are welcome

Note: CSAP PD Webinars are posted to the CSAP website

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MOE Land Remediation Conference

- MOE requested CSAP coordinate the Technical Stream for their Land Remediation Conference in September 2015
- Overarching themes of Technical Stream include Emerging Toxicants, Remedial Technologies, Sustainable Remediation and Risk Assessment
- Registration is open – Preliminary Agenda to be released soon

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Submission Manager Update

- Last year, PD Committee completed a review of the CSAP Submission Manager. Informal feedback from members indicated the manager was a useful tool but some tweaking of output was required.
- A programming contractor was engaged to make changes to the Manager largely based on the Annotated SoSC.

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Submission Manager Update

- So far, the speed of the Manager, a common concern, has been improved.
- Currently upgrading Section 4.5 (APECs and PCOCs), which was universally pointed to as the biggest issue. Trying to coincide with new omnibus standards.

CSAP FALL WORKSHOP

- Scheduled for November 23, 2016
- Agenda is in the planning stages but the PD Committee is still receiving suggestions for Workshop so if you have one…

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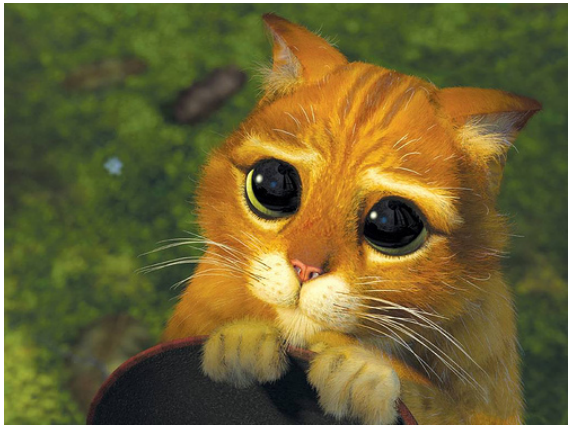
SPECIAL THANKS

- After three years, Bob Symington is stepping down from the PD Committee
- Has been a valuable and proactive member of the Committee
- Pioneered the CSAP Webinars and has coordinated them since.

FINAL REQUEST



Please, I want some more…

- Webinar and Workshop Suggestions
- Feedback on AGM Survey
- Committee Volunteers – We currently have two openings (remember you get paid for meeting time)

DISCIPLINE COMMITTEE

Chair:	**Colin Dunwoody,** P.Eng., Director	
Members:	**Ken Evans,** P.Eng.	**Reg North,** P. Eng., P.Geo.
	Dave Mitchell, P.Eng.	

The Discipline Committee acts on behalf of the Board in dealing with complaints and determining appropriate measures for submissions found deficient through the Performance Assessment process.

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MANDATE

Address written complaints about a member regarding:

- CSAP work conducted in incompetent manner
- Professional misconduct or conduct contrary to CSAP Rules
- Breach of the CSAP code of ethics

CSAP has not received any written complaints requiring disciplinary action

MANDATE

When assessing appropriate measures to apply to a Performance Assessment found deficient the Discipline Committee will review the following as applicable:

- PA Stage 1 Report Additional information Addendum Final Findings Reports
- Delegated Member letters
- Approved Professional's PA history
- Input from the Delegated Member

Measures considered appropriate are listed in the Discipline Committee Guidelines

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NEW IN 2015-16

In summary

- The committee is now responsible for reviewing and assessing measures for deficient submissions
- The Discipline Committee Guidelines are available at

  http://csapsociety.bc.ca/members/discipline/

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GOVERNANCE COMMITTEE

Chair:	**Jim Malick,** Ph.D., R.P.Bio., P.Ag., Director, Past President
Members:	**Cindy Ott,** M.Sc., P.Ag., GeoL., P.Chem. Past President
	Greg Sutherland, Ph.D., R.P.Bio., Past President
	Paul Cassidy J.D., Director

- Governance: effective functioning of the Board of Directors and committees
- Advisory Council TOR
- Committee TORs Revised
- Director qualifications established
- Board evaluation
- Conflict of interest guidelines for PAC

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GOVERNANCE COMMITTEE

- Board conflict of interest policy/guidelines/forms
- All initiatives were approved by the Board
- Thank you to Cindy, Greg, and Paul who were instrumental in the success of the committee

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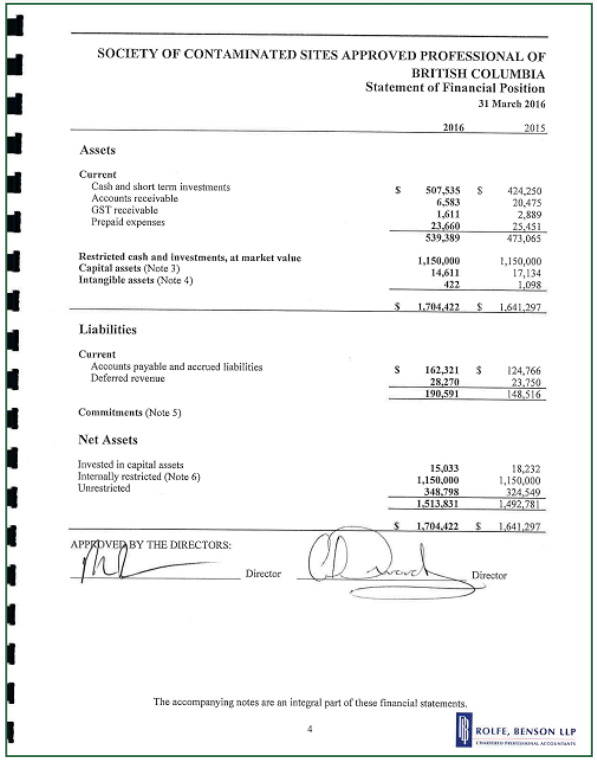
3. 2015-2016 FINANCIAL STATEMENTS

Ross Wilson, Secretary/Treasurer

Approval of the Financial Statements (Attachment 2):



SOCIETY OF CONTAMINATED SITES APPROVED PROFESSIONAL OF BRITISH COLUMBIA
Statement of Financial Position
31 March 2016

	2016	2015
Assets		
Current		
Cash and short term investments	$ 507,535	$ 424,250
Accounts receivable	6,583	20,475
GST receivable	1,611	2,889
Prepaid expenses	23,660	25,451
	539,389	473,065
Restricted cash and investments, at market value	1,150,000	1,150,000
Capital assets (Note 3)	14,611	17,134
Intangible assets (Note 4)	422	1,098
	$ 1,704,422	$ 1,641,297
Liabilities		
Current		
Accounts payable and accrued liabilities	$ 162,321	$ 124,766
Deferred revenue	28,270	23,750
	190,591	148,516
Commitments (Note 5)		
Net Assets		
Invested in capital assets	15,033	18,232
Internally restricted (Note 6)	1,150,000	1,150,000
Unrestricted	348,798	324,549
	1,513,831	1,492,781
	$ 1,704,422	$ 1,641,297

APPROVED BY THE DIRECTORS:

Director Director

The accompanying notes are an integral part of these financial statements.

4

ROLFE, BENSON LLP

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4. Appointment of the Auditor

Rolfe, Benson LLP

ROLFE, BENSON LLP
CHARTERED ACCOUNTANTS

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 |

5. Election of Directors

Robin Jones, President

CSAP Bylaws allow for a total of 12 Directors

5 of which are at-large Directors:

Colin Dunwoody
Robin Jones
Peter Reid
Andrew Sorensen
Scott Steer

4 of which are appointed by MoE:

Kristi Thornhill,
representing industry

Patrick Johnstone,
representing local government

Paul Cassidy,
environmental representative

Vince Hanemayer,
representing MoE

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5. Election of Directors

- Today we will be electing the **3 directors** representing our parent organizations.
- Please refer to your ballot, there should be a line to Include nominations from the floor
- Call for nominations from the floor

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5. Election of the 3 Directors representing Parent Organizations

Introduction of candidates:

APEGBC
Association of Professional Engineers and Geoscientists of BC

- Tony Gillett, P.Eng.
- Reidar Zapf-Gilje, P.Eng.

Nominated from the floor

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5. Election of the 3 Directors representing Parent Organizations

Introduction of candidates:

CAB

College of Applied Biology of British Columbia

- Trish Miller, R.P.Bio., Risk Approved Professional
- Beth Power, R.P.Bio., Risk Approved Professional

Nominated from the floor

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5. Election of the 3 Directors representing Parent Organizations

Introduction of candidate:

BCIA
British Columbia Institute of Agrologists

- Eva Gerencher, M.Sc., P.Ag., Numerical Approved Professional

Nominated from the floor

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5. Election of the 3 Directors representing Parent Organizations

Please review the candidate statements (Attachment 3) and mark your ballots (Attachment 4) now.

A basket will be circulated to collect the ballots

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6. NEW BUSINESS

Robin Jones

6.1 MoE requests that CSAP take over processing instrument amendments

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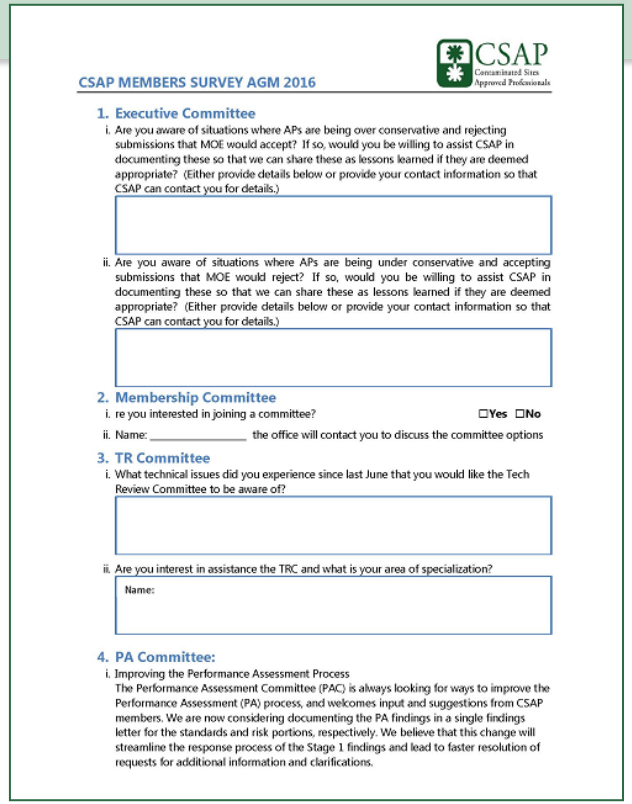
6. NEW BUSINESS

Catherine Schachtel,
Executive Director

6.2 Members Survey (Attachment 5)

Please return your completed Survey to the registration area at the end of the meeting



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CSAP MEMBERS SURVEY AGM 2016

1. Executive Committee

i. Are you aware of situations where APs are being over conservative and rejecting submissions that MOE would accept? If so, would you be willing to assist CSAP in documenting these so that we can share these as lessons learned if they are deemed appropriate? (Either provide details below or provide your contact information so that CSAP can contact you for details.)

ii. Are you aware of situations where APs are being under conservative and accepting submissions that MOE would reject? If so, would you be willing to assist CSAP in documenting these so that we can share these as lessons learned if they are deemed appropriate? (Either provide details below or provide your contact information so that CSAP can contact you for details.)

2. Membership Committee

i. re you interested in joining a committee? ☐Yes ☐No

ii. Name: _____ the office will contact you to discuss the committee options

3. TR Committee

i. What technical issues did you experience since last June that you would like the Tech Review Committee to be aware of?

ii. Are you interest in assistance the TRC and what is your area of specialization?

Name:

4. PA Committee:

i. Improving the Performance Assessment Process
The Performance Assessment Committee (PAC) is always looking for ways to improve the Performance Assessment (PA) process, and welcomes input and suggestions from CSAP members. We are now considering documenting the PA findings in a single findings letter for the standards and risk portions, respectively. We believe that this change will streamline the response process of the Stage 1 findings and lead to faster resolution of requests for additional information and clarifications.

7. Introduction of the 3 Directors

Catherine Schachtel, Executive Director

Congratulations to our new Directors!

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8. Thank you to Kristi Thornhill

8. Thank you to Paul Cassidy

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8. Thank you to Ross Wilson

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8. Thank you to Jim Malick

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9. OFFICAL CLOSING OF THE 2015-2016 ANNUAL GENERAL MEETING

Robin Jones, President

The AGM portion of the day is now concluded.
Thank you for attending

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10:15 – 10:40

COFFEE BREAK

Liability for Remediation of Contaminated Sites

Allocating Liabilities & Recovering Remediation Costs under the EMA

Robin J. Gage, PARTNER

816 – 1175 Douglas Street, Victoria, BC V8W 2E1
T: 250-380-2788 | **F**: 1-888-575-3281| www.ulit.ca

AGENDA

I – Principles of Liability

II – Tips

III – Questions/Comments

Part I - Principles of Liability

Liability is status based and not fault based.

Liability is absolute, retroactive and joint and separate.

Some limited exemptions for liability exist.

Remediation costs must be “reasonable”.

Absolute/Status Based Liability

Once a party falls within certain objective category they are a “responsible person” for remediation under the *EMA*.

A “responsible person” is defined broadly, but the main categories are current and former owners and occupiers of a property.

EMA sets up no-fault system for responsible persons - no need to demonstrate fault or causation.

Exemptions from liability for these categories are very limited: do not include due diligence or lack of “fault”.

Retroactive Liability

The *Act* reaches back in time and imposes liability on anyone who *ever* fell within the definition of owner or occupier of the property.

There is no limitation period until contamination is found and remediation is undertaken.

Doesn’t matter whether person acted in accordance with standards applicable at the time of ownership.

Joint and Separate Liability

A plaintiff can choose to seek compensation from one, some or all "responsible persons".

An owner or former owner can therefore be liable for up to 100% of the cost of cleanup even if they only owned the property for a small period of time.

Although a current or former owner may be able to seek contribution from other former owners, the onus to do so rests with them.

Exception to joint liability for minor contributors.

Innocent Acquisition Defence

Already contaminated but no reason to know or suspect contamination at time of acquisition.

Undertook all appropriate inquiries consistent with customary practice.

Didn’t transfer interest without disclosing any known contamination.

Onus is on responsible person to prove they meet all of these criteria.

Migration

No liability if can prove all contamination migrated from another property.

May have some liability if contamination spreads after discovery (goes to “reasonableness” of remediation costs)

Often no positive obligation on neighbour to remediate – just to reimburse for remediation.

Reasonableness

Generally where remediation undertaken by qualified professionals the court will assume reasonableness.

Can get into battles of experts questioning reasonableness.

Timing of remediation may be an issue.

Can serve to reduce recovery if an expense found to be unreasonable.

Part II - Tips

Conduct Proper Investigations prior to purchasing property.

Make sure client hires environmental consultant and legal counsel with required expertise.

Ensure client, consultant and lawyer work together and share information throughout the process.

Investigations

Purchasers and current homeowners need to conduct proper investigations

- Check municipal records (but don’t rely on them).
- Pay for a good tank scan.
- Know the neighbourhood and the home.

Tanks must be removed and soil tested.

- Use reputable companies and qualified professionals.

Special Expertise

Remediation Experts

- Need to be a “qualified professional”.
- Familiarity with conditions in that area and with EMA/CSR regime.
- May need to be an expert witness.

Legal Experts

- Must fully understand the statutory regime.
- Important for both plaintiff and defendant.
- Can otherwise cause increased/unnecessary litigation expenses or liability issues.

Working Together

Share information consistently throughout the process, but particularly:

- When first retained;
- When new defences are raised;
- When issues uncovered; and
- When settlement is contemplated.

Discuss evidentiary issues.

- How does this impact the testing that may be required?
- Are additional investigations warranted?
- Can you demonstrate “reasonableness”?

Professional Development for our Mind

Peter Reid
Susan Burak

Society in general is becoming more aware of our mental health and what we should do to support ourselves.

- Bell “Let’s Talk Canada”
- Healthy Minds Canada

- How much does our profession affect our mental health?
  - What we do is different than a typical engineer / scientist
  - Relates closer to that of a lawyer, an auditor, or dentist.
    - look for problems all day long

What do we do as CSAPs?

- Typical day in the Life of a CSAP
  - We need to review historical reports to look for past problems.
  - When we find one we need to tell someone the bad news that they have a contaminated site
  - Then we review reports to look for mistakes in the report.
  - Maybe an expert witness report

What do we do as CSAPs?

CSAP Society

- Typical day in the Life of a CSAP
  - When we do submit a report 1 in 8 are audited by two peers.
  - All reports go through detailed screening.
  - Then the MOE reviews the report.
  - If the MOE finds an issue they are required to report to our parent organization.
  - We are required to be:
    - Pessimistic – paid to look for problems
    - Paranoid – several levels of review
    - Survivors – no one is ever happy

What do we need to be aware of?

CSAP Society

- CSAP is new and there are few similar bodies around the world
- Need to look to similar professions to determine what we need to be aware of:
  - Research has shown that being paid to be pessimistic for long periods of time has serious effects on their mental health.

What do we need to be aware of?

CSAP Society

- This can manifest itself in many ways:
  - Depression
  - Chemical Addictions
  - Gambling Addictions
  - Marital Stress at Home
  - Stress with children at home
- Important thing is to recognize and get help to deal with it.
- How many people have you seen deal with the above or walk away from the profession.

What do we need to be aware of?

CSAP Society

- Accounting firms have large internal campaigns on mental health.
- Deloitte has internal “Mental Health Champions”
- Locally there is the Lawyers Assistance Program of BC.
  - Susan Burak, B.A., J.D., M.A.
  - Associate Director, LAP

    Registered Clinical Counsellor

- Presentation will be both Slides and Workbook
- Introduce Vicarious Trauma (“VT”) Characteristics and Signs and Symptoms
- Resilience and Protective Factors
- Coping Strategies
- Transformational Strategies

LAPBC

CSAP Society

Transforming Vicarious Trauma ("VT")

- Vicarious Trauma is more than merely a "Stress or Burnout Reaction" but can result from cumulative stress, burnout, and compassion fatigue as a result of repetitive exposure to toxic situations or consistently negative situations;
- Vicarious Trauma became increasingly recognized "as a cumulative process through which a working professionals inner mental experience is negatively transformed" (Pearlman & Saakvitne, 1995)

VT Characterized by the Erosion of Optimism

- The "Contagion Effect" of negativity
- Negativity sticks in our awareness like "Velcro" but Positive experiences wash off us like we are coated with "Teflon". (Hanson: *"Hardwiring Happiness")*

Common Signs and Symptoms of VT can include the following:

- Social withdrawal;
- Emotional lability;
- Aggression;
- Greater sensitivity to violence;
- Somatic symptoms including Anxiety and Panic Attacks;
- Sleep difficulties: hyperarousal and hypervigilance;
- Intrusive Imagery which could lead to avoidance behaviours and procrastination;
- Cynicism;
- Boundary issues;
- Relationship difficulties (security, trust, esteem)

Along with VT some of these typical PTSD signs and symptoms may be experienced concurrently:

- Emotional and physical exhaustion;
- Emotions arise suddenly without warning;
- Tendency to isolate and withdraw socially;
- Reluctance to discuss problems;
- High stress levels and irritability.

Some other symptoms similar to PTSD may include:

- Preoccupation, ie: obsessed with problematic situations;
- Avoidance, in which we try and reduce our exposure to new such events; and
- Hyperarousal or Hypervigilance

Resilience and Protective Factors

- Training and Preparation
- Coping Style (personality style)
- Manageable Workload
- Understanding Current Life Context
- Education about VT
- Sense of Control through setting healthy boundaries around work

Coping Strategies

- The ABC's of addressing VT
- Awareness
- Balance
- Connection

(see p.1 of workbook)

(Saakvitne & Pearlman, 1996)

Creating Healthy Boundaries

- Self Awareness
- Understanding Core Values
- Emotional Self Care

(p. 5 & 6 of Workbook)

Coping Strategies

- Self Care (Body, Mind, and Soul)
- Life Balance
- Rest
- Play
- Hobbies
- Humour (p. 7 & 8)

Transformational Strategies

To overcome the erosion of optimism and meaningfulness that accompanies VT:

- Create Community
- Practice Gratitude
- Cultivate Optimism
- Avoid Overthinking
- Increase Social Connectedness
- Practice Forgiveness
- Practice Mindfulness and Meditation

(p. 9-13)

Meaning is Transformational

CSAP Society

Creating Meaning is Transformational

- Finding Meaning in Work and Life

➢ It is normal to have some reaction or symptoms (anger, rage, fear, insomnia)

➢ Recall of trauma is often triggered by something in the present that needs attention. Get Talking – Get Counselling

➢ Constructive Group Sharing and Discussion

➢ Positive Outcomes can emerge such as growth, strength, hope.

Where do we go from here?

CSAP Society

- I would like to thank Susan for her talk.
- Where do you go from here:
  - Your company may have an Employee Assistance Program
  - We are setting up something with CSAP to provide access to a councillor
  - If you just need to talk.
    - ptryqx@me.com
    - 7783941442

Where do we go as CSAP?

- We need to find a way to ratchet down the audit / performance assessment stress.
  - More training so submissions are better.
  - Work with MOE to smooth out the process.
- We need to find a way to celebrate:
  - How many sites have we remediated?
  - How much have we been able to reduce the overall cost per site since we began doing this?
  - How many people are healthier because they are not exposed to these contaminants?

2016 CSAP Scholarship Awards

Guy Patrick

CSAP
Society of Contaminated Sites Approved Professionals of British Columbia

2016 CSAP Scholarship Awards

Paul Antonelli

Thompson River University

Restoration Ecology

CSAP
Society of Contaminated Sites Approved Professionals of British Columbia

2016 CSAP Scholarship Awards

Laurier Collette

UBC Geological Engineering

Hydrogeology

CSAP
Society of Contaminated Sites Approved Professionals of British Columbia

2016 CSAP Scholarship Awards

Marie Goddard

University of Utrecht

Hydrology

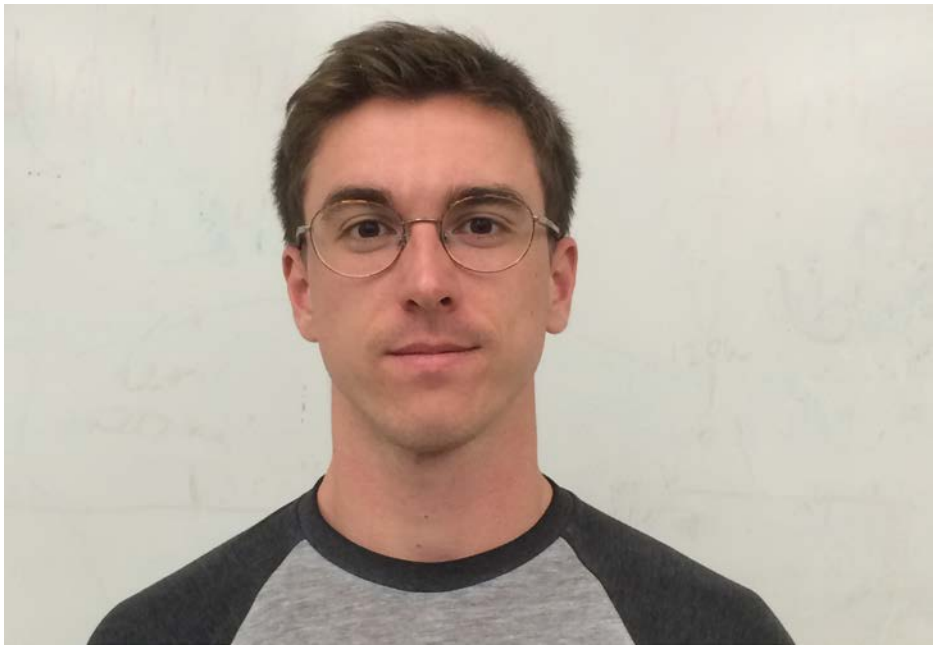
CSAP
Society of Contaminated Sites Approved Professionals of British Columbia

2016 CSAP Scholarship Awards

Matthew Simons

Simon Fraser University

Hydrogeology



CSAP
Society of Contaminated Sites Approved Professionals of British Columbia

12:00 – 1:30

LUNCH BREAK

12:00 – 1:30

LUNCH BREAK

Welcome to the Ministry of Environment of BC

CSAP
Society of Contaminated Sites Approved Professionals of British Columbia

OMNIBUS UPDATES

GLYN R. FOX
HEAD, SCIENCE & STANDARDS

CSAP 2016 AGM & PD Workshop
June 8, 2016

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DISCLAIMER

The following presentation provides information related to a proposed Stage 10 amendment to the Contaminated Sites Regulation. The primary focus of that proposed amendment is the updating and revision of the numerical environmental quality standards of the Regulation. The proposed Stage 10 amendment has not yet been approved, and as such, **all aspects of the presentation are subject to change and no reliance whatsoever can be placed on the content of the presentation**.

OMNIBUS UPDATE - OUTLINE

1. **CSAP October 2015 Omnibus Update**
   a. General concerns
   b. Specific concerns

2. **Winter 2015 Omnibus activities**
   a. Response to Comment
   b. Supplemental proposal papers
   c. 1st Nations consultations

3. **Spring 2016 Omnibus activities**
   a. Final Stakeholder Information Session
   b. Final protocol papers
   c. Final checks to standards
   d. Final emerging contaminants
   e. New schedules format
   f. New standards statistics

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OMNIBUS UPDATE - OUTLINE

4. **CSAP Examples of New Standards Impacts**

5. **Status of Minister's and LGIC orders**
   a. Stage 10 Amendment to CSR (Minister's Order)
   b. Consequential HWR/OMRR Amendments (LGIC Order)

6. **Advice re: Casefile submission dates**

7. **Omnibus 2 – Transition Period**

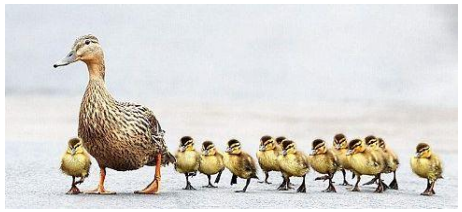
8. **Omnibus 3 – Next Cycle**

CSAP COMMENTS – NON-TECHNICAL

CSAP comments which have resulted in changes to proposals include:

General concerns

1. Concern for a “Coming into Force” provision
2. Concerns related to PHC fractions, analytical methods, possible adoption of CCME guidelines and derivation methods for updating MoE VPH/LEPH/HEPH soil and water standards
3. Concerns re: Human Health and Ecological TRVs
4. An opportunity to review/comment on draft standards



A NEW WAY FORWARD

BRITISH COLUMBIA Ministry of Environment

CSAP COMMENTS - TECHNICAL

Specific concerns

Concerns for proposed Environmental Health matrix stds:

1. WL concerns re: use of NOEC/LOEC data
2. combining of lethal and non-lethal data
3. refinement of new regression method
4. use of CL soil invert/plant standard for HDR land use
5. desire for early access to datasets used in derivations

Concerns for Human Health matrix stds:

1. will clinical adjustment factors be used for As, Cd & Pb ?
2. Human Health ET for WL – 52, 26 or 13 weeks ?
3. use of child receptor - too conservative for CL
4. desire for early access to TRVs, bioavailability factors, etc. used in derivations

CSAP COMMENTS - TECHNICAL

Specific concerns

Concerns for new GW model and matrix Soil to GW stds:

1. will result in less stringent stds for substances subject to bio-decay and absorption (e.g. benzene) but more stringent stds for substances with revised Kds and new water quality stds (e.g. metals)
2. need for P2 leachate test and new P2 linked parameter suites
3. desire for 2005 SABCS recommendations to be fully addressed for Stage 10

Concerns for water stds:

1. inconsistency between Hel Can and MoE tox-based DW stds
2. proposed new Hardness AW standard
3. need for Sch 10 DW standards to be media apportioned
4. proposed antimicrobial and E2 water standards will capture domestic waste water and septic fields
5. timing of Hel Can vs. MoE proposed PFOS/POFA water standards

MINISTRY RESPONSE TO COMMENT

Posted Ministry Response to Comment Received

Issued two supplemental protocol papers for comment:

1. Two tier ecological health protective Wildlands standards
2. Set human health protective standards for carcinogenic substances based on more stringent of non-carcinogenic or carcinogenic toxic endpoints

Initiated on-line poll re: length of time for "transition period"

http://www2.gov.bc.ca/assets/gov/environment/air-land-water/site-remediation/docs/archived-e-link-messages/2015-archived-cs-e-link-messages.pdf (Look for: Omnibus Updating of CSR Standards Related Documents Dec 18, 2015)

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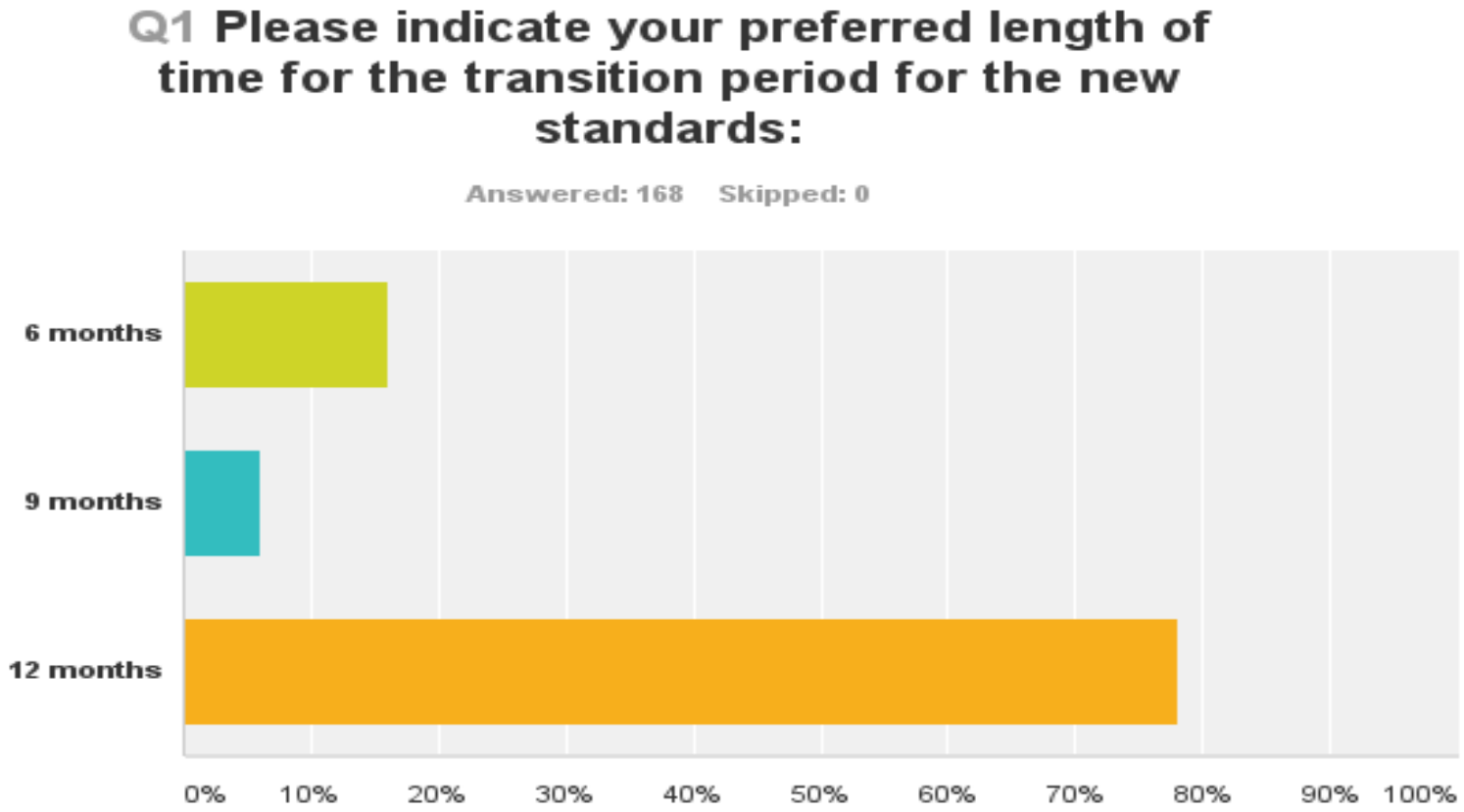
TRANSITION PERIOD – ON-LINE SURVEY RESULTS



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FINAL REVISED CSST PROTOCOL PAPERS

Final Protocols papers posted to web

1. Sch 4-5 HH – Protocol Summary – Matrix Soil Standards (Human Health)
2. Sch 4-5 EH – Protocol Summary – Matrix Soil Standards (Ecological Health)
3. Sch 6 – Protocol Summary – Water Standards
4. Sch 9 – Protocol Summary – Sediment Standards
5. Sch 10 – Protocol Summary – Generic Soil Standards
6. Sch 11 – Protocol Summary – Vapour Standards

Final Stakeholder Information meeting on Final Protocol papers - March 2, 2016

"The standards are simply the product of the protocol"

http://www2.gov.bc.ca/gov/content/environment/air-land-water/site-remediation/contaminated-sites/cs-e-link-recent-messages

(Look for: CSR Standards Protocol Papers released - March 8, 2016)

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SUMMARY PROTOCOL PAPERS – WHAT WAS CHANGED/DECIDED

CSR Sch X – Human Health Soil standards

Proposal Concern/Decision	Change/Decision
1. Exposure terms too conservative	- ET adjustment deferred to next cycle - changed RLHDR SIR from 80 to 40 mg/d
2. For Ca. substances - Set std to more stringent of Ca./non-Ca. endpoints	- Proposal adopted
3. Eliminate clinical adjustment factors for: arsenic, cadmium and lead	- clinical adjustment factors eliminated
4. Follow TG 7 hierarchy for TRVs	- Proposal adopted

Next cycle

1. Re-consider conservatism of Exposure terms
2. Revise/eliminate quantitative soil stds
   (e.g. NAPL – not present, odorous substances – not present)
3. Revise/replace VPH/LEPH/HEPH standards
   (possibly CCME Canada Wide Standard for PHC)

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SUMMARY PROTOCOL PAPERS – WHAT WAS CHANGED/DECIDED

CSR Sch X – Ecological Health Soil standards

Proposal Concern/Decision	Change/Decision
1. WL EC 15 standard too conservative for C/I sites reverting to Wildlands	- Adopted, 2 tier Wildlands standards ($WL_{Natural}$ and $WL_{Reverted}$)
2. RL_{HDR} (set = 1/2 CL) too conservative	- Agreed, RL_{HDR} (set = CL)
3. $WL_{Natural}$ (set = PL/2) too arbitrary	- Agreed, new empirically derived "divisor" = 1.6 used to set $WL_{Natural}$ (set = PL/1.6)
4. More toxicity data needed to set WL stds	- CSAP funded review to augment augment toxicity data

Next cycle

1. Consider wildlife soil/fodder stds to supplement livestock soil/fodder stds
2. Consider developing soil invert/plant bioavailability/bioaccumulation EH soil stds
3. Consider developing terrestrial vertebrate EH soil standards

SUMMARY PROTOCOL PAPERS – WHAT WAS CHANGED/DECIDED

CSR Sch X – Soil to Groundwater standards

Proposal Concern/Decision	Change/Decision
1. Some US EPA Kds unreliable	- Retained most US EPA soil-water distribution coefficient isotherms - adopted *Sauve et al,* 2000 isotherm for lead
2. Need for peer reviewed mixing model equations	- GW model changed to use peer reviewed US EPA 2002 Soil Screening Guidance mixing model
3. Adopt US EPA 1996 pH-dependent K_{oc} isotherm for pentachlorophenol	- Agreed US EPA PCP isotherm was adopted

Next cycle

1. Reassess assumptions for Dilution Attenuation Factor (DAF) value
2. For chlorinated solvents, evaluate ways to determine whether biodegradation occurs and consider concomitant potential for toxic daughter products in groundwater

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SUMMARY PROTOCOL PAPERS – WHAT WAS CHANGED/DECIDED

CSR Sch W – Water Standards

Proposal Concern/Decision	Change/Decision
1. For HC DW stds limit *de novo* derivation of tox-based DW stds to only those with aesthetic-based DW standards	- Agreed
2. For Ca. substances, derive *de novo* DW std based on more stringent of Ca. or non-Ca. toxic endpoints	- Agreed
3. Adjust Sch 10 DW stds to reflect CSST Protocol ILCR and default 20% DW exposure apportionment	- Agreed
4. For volatile substances include exposure from showering in DW tox-based derivations	- Deferred to next cycle

Next cycle

1. Update DW derivation protocol for volatile/semi-volatile substances, by including DW exposure via inhalation from showering or grooming

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SUMMARY PROTOCOL PAPERS – WHAT WAS CHANGED/DECIDED

CSR Sch V – Vapour Standards

Proposal Concern/Decision	Change/Decision
1. Wildlands vapour stds defined exposure scenario is premature and lacks sufficient scientific support	- Agreed, deferred to next cycle
2. Parkade assumed exposure term is too conservative	- PK ET retained, (SABCS and CSAP supported)

Next cycle

1. Re-consider "state of the science" for human health protective generic vapour stds for wildlands land use
2. Consider developing new soil vapour standards for additional substances (e.g., emerging volatile substances, semi-volatiles, mercury vapour, etc.).
3. Review options to possibility update VPHv std and possibly derive new vapour stds related to other petroleum hydrocarbon fractions

OMNIBUS – FINAL CHECKS

BCELTAC Checks

1. Substance naming convention check
2. Analytical method availability check
3. Analytical method detection limit check
4. “Dissociation” check
5. Flammability/Lower Explosive Limit check – vapours
6. Laboratory “Reality” check

   (e.g. prohibitive analytical cost, limited lab capacity, etc.)

LRS Checks

1. Solubility check
2. Provincial Background check
3. Regulatory Consistency check (HWR/OMRR consequential amendments)

OMNIBUS - EMERGING CONTAMINANTS SELECTION CRITERIA

Significantly toxic

Serious acute/chronic toxic effects

e.g. neurotoxin/developmental toxicant, carcinogen, endocrine disruptor, teratogen, etc.

Persistent/bioaccumulative

e.g. heavy metals, PAHs, pesticides, etc.

Substance is used in British Columbia

e.g. used in agriculture, commerce, industry, etc.

Known to have environmental impact in BC

e.g. nonylphenol, EE2, PFOS, etc.

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OMNIBUS – FINAL EMERGING CONTAMINANTS

Standards Derived for Following Emerging Contaminants

Soil – Emerging Contaminant

1. cyanide
2. DIPA (diisopropanolamine)
3. anthracene/fluoranthene
4. nonylphenol & nonylphenol ethoxylates
5. PFOS (perfluorooctane sulfonate
6. sulfolane [1]
7. uranium

Water – Emerging Contaminant

1. cyanide
2. DIPA (diisopropanolamine)
3. EE2 (17-α-ethinylestradiol)
4. nonylphenol & nonylphenol ethoxylates
5. PFOS (perfluorooctane sulfonate)
6. PFOA (perfluorooctanoic acid)
7. sulfolane [1]

[1] Sulfolane is 2,3,4,5-tetrahydrothiophene-1,1-dioxide

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WATER STANDARDS – DIFFERENTIAL APPLICATION

Water Standards for emerging contaminants

1. are not universally applicable to all CSR Sch 2 uses
2. rather have been assigned differential CSR Sch 2 applications

GENERIC NUMERICAL WATER STANDARDS				
Substance	**Aquatic Life (AW)**	**Irrigation (IW)**	**Livestock (LW)**	**Drinking water (DW)**
magnesium				100 mg/L[11]
manganese		200[60,61]		550[56,57,60,61]
mercury	1	1	2	1

[60] Standard applies to a site used for an industrial or commercial purpose or activity set out in Schedule 2 as

(a) item B1,	battery manufacture – bulk storage
(b) item C1, C3 or C4,	smelting, metal plating, metal salvage
(c) item D2, D3, D5, or D6,	coal mining/bulk storage, nonferrous metal mining/smelting
(d) item E4, or	coal gasification
(e) item H3 or H14	battery recycling, mine tailings waste

OMNIBUS – NEW SCHEDULES FORMAT

Sch X All Parts

8 land uses vs 5 existing land uses

Sch X Part 1 – Matrix soil standards

19 new matrices (41 vs existing 22 matrices)

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NEW MATRIX FORMAT

MATRIX NUMERICAL SOIL STANDARDS[1]
ETHYLBENZENE (CHEMICAL ABSTRACT SERVICE NUMBER 100-41-4)

COLUMN I	COLUMN II	COLUMN III	COLUMN IV	COLUMN V	COLUMN VI	COLUMN VII	COLUMN VIII	COLUMN IX	Note
Site-specific Factor	Wildlands Natural (WL_N)	Wildlands Reverted (WL_R)	Agricultural (AL)	Urban Park (PL)	Residential Low Density (RL_{LD})	Residential High Density (RL_{HD})	Commercial (CL)	Industrial (IL)	2
HUMAN HEALTH PROTECTION									
Intake of contaminated soil	8 500	8 500	4 000	8 500	4 000	8 500	25 000	700 000	3
Groundwater used for drinking water	10	10	10	10	10	10	10	10	
ENVIRONMENTAL PROTECTION									
Toxicity to soil invertebrates and plants	100	200	200	200	200	650	650	650	
Livestock ingesting soil and fodder			NS						4
Major microbial functional impairment			NS						4
Groundwater flow to surface water used by aquatic life									
Freshwater	150	150	150	150	150	150	150	150	5
Marine	200	200	200	200	200	200	200	200	5
Groundwater used for livestock watering			NS						4
Groundwater used for irrigation			NS	NS	NS	NS			4

Notes

1. All values in µg/g unless otherwise stated. Substances must be analyzed using methods specified in: the 2015 British Columbia Environmental Laboratory Manual, as updated from time to time, a director's protocol, or alternate methods acceptable to the director.
2. The site-specific factors of human intake of contaminated soil and toxicity to soil invertebrates and plants specified in this matrix apply at all sites.
3. Intake pathway of exposure modeled is inadvertent ingestion of soil.
4. NS – no standard. Insufficient acceptable scientific data exists to calculate a standard, or no appropriate standard, guideline or criterion exists to use to develop a soil quality standard.
5. Standard has been adjusted based on a modelled leachate concentration equivalent to the substance solubility limit for use in the soil to groundwater transport model.

OMNIBUS – NEW SCHEDULES FORMAT

Sch X All Parts

8 land uses vs 5 existing land uses

Sch X Part 1 – Matrix soil standards

19 new matrices (41 vs existing 22 matrices)

Sch X Part 2 – Generic HH soil standards

Consolidates/updates existing CSR Sch 4 & 10 substances

New HH standards for Sch 4 substances

Updated HH standards for Sch 10 substances

Sch X Part 3 – Generic EH soil standards

Consolidates/updates existing CSR Sch 4 & 10 substances

A few updated/new EH standards for Sch 4 substances

NEW SCH X PART 2/3 FORMAT

SCHEDULE X – PART 2

GENERIC NUMERICAL SOIL STANDARDS TO PROTECT HUMAN HEALTH[1,2]

COLUMN I	COLUMN II	COLUMN III	COLUMN IV	COLUMN V	COLUMN VI	COLUMN VII	COLUMN VIII	COLUMN IX	COLUMN X
Substance	Chemical Abstract Service Number (CAS)	Wildlands Natural (WL_N)	Wildlands Reverted (WL_R)	Agricultural (AL)	Urban Park (PL)	Residential Low Density (RL_{LD})	Residential High Density (RL_{HD})	Commercial (CL)	Industrial (IL)
acenaphthene	83-32-9	2 000	2 000	950	2 000	950	2 000	15 000	15 000
acephate	30560-19-1	100	100	60	100	60	100	750	750
acetic acid, 2-methyl-4-chlorophenoxy-[MCPA]	94-74-6	15	15	8	15	8	15	100	100
acetochlor	34256-82-1	650	650	300	650	300	650	4 500	4 500
acetone	67-64-1	30 000	30 000	15 000	30 000	15 000	30 000	200 000[3,4]	200 000[3,4]
acetophenone	98-86-2	3 000[3]	3 000[3]	1 500[3]	3 000[3]	1 500[3]	3 000[3]	25 000[3,4]	25 000[3,4]
acrolein	107-02-8	15	15	8	15	8	15	100	100
acrylamide	79-06-1	1	1	0.6	1	0.6	1	15	15
acrylic acid	79-10-7	15 000	15 000	8 000	15 000	8 000	15 000	100 000	100 000
acrylonitrile	107-13-1	5	5	2.5	5	2.5	5	10	10
adipic acid	124-04-9	65 000[4]	65 000[4]	30 000[4]	65 000[4]	30 000[4]	65 000[4]	450 000[4]	450 000[4]
alachlor	15972-60-8	50	50	25	50	25	50	100	100
aldicarb	116-06-3	30	30	15	30	15	30	250	250
aldicarb sulfone	1646-88-4	30	30	15	30	15	30	250	250
aldrin	309-00-2	0.15	0.15	0.08	0.15	0.08	0.15	0.4	0.4
allyl alcohol	107-18-6	150	150	80	150	80	150	1 000	1 000
allyl chloride	107-05-1	150	150	65	150	65	150	300	300
aluminum	7429-90-5	30 000	30 000	15 000	30 000	15 000	30 000	250 000[4]	250 000[4]
ametryn	834-12-8	300	300	150	300	150	300	2 000	2 000
aminobiphenyl, 4-	92-67-1	0.15	0.15	0.065	0.15	0.065	0.15	0.3	0.3
aminophenol, 3-	591-27-5	2 500	2 500	1 500	2 500	1 500	2 500	20 000	20 000
aminophenol, 4-	123-30-8	650	650	300	650	300	650	4 500	4 500
amitraz	33089-61-1	80	80	40	80	40	80	600	600
aniline	62-53-3	200	200	100	200	100	200	1 000	1 000
anthraquinone, 9,10-	84-65-1	65	65	30	65	30	65	150	150
antimony	7440-36-0	500[5]	500[5]	250[5]	500[5]	250[5]	500[5]	1 500[5]	40 000[5]

OMNIBUS – NEW SCHEDULES FORMAT

Sch W – Water standards

Same 4 water uses: Aquatic Life, Irrigation, Livestock, and Drinking water

New emerging toxicants added

New toxicologically derived drinking water standards for substances

a. Lacking drinking water standards
b. Having only aesthetic based Canadian Drinking Water Guidelines

Sch 10 Drinking water standards now CSST media apportioned

Sch S – Sediment standards

No change – Some minor formatting changes

CHANGE IS GOOD, BUT TRANSFORMATION IS BETTER

Sch V – Vapour standards

Sch 11 standards updated

New “Parkade” vapour standards

NEW SCH V FORMAT

SCHEDULE V

GENERIC NUMERICAL VAPOUR STANDARDS [1,2,3,4,5]

COLUMN I	COLUMN II	COLUMN III	COLUMN IV	COLUMN V	COLUMN VI
Substance	Chemical Abstract Service Number (CAS)	Agricultural, Urban Park, Residential Use Standard [6]	Commercial Use Standard [7]	Industrial Use Standard [8]	Parkade Use Standard [9]
acetaldehyde	75-07-0	4.5	15	40	35
acetone	67-64-1	2 500	7 000	25 000	20 000
acetone cyanohydrin	75-86-5	2	6	20	15
acetonitrile	75-05-08	60	200	550	500
acrolein	107-02-8	0.2[10]	0.2[10]	0.2[10]	0.2[10]
acrylonitrile	107-13-1	0.5[10]	0.5[10]	1.5	1
allyl chloride	107-05-1	1	3	9	8
ammonia (as N)	7664-41-7	100	300	900	800
benzene	71-43-2	1.5	4	10	10
benzotrichloride	98-07-07	1[10]	1[10]	1[10]	1[10]
benzyl chloride	100-44-7	0.2	0.6	2	1.5
bis(2-chloro-1-methylethyl) ether	108-60-1	100	300	1 000	850
bis(2-chloroethyl) ether	111-44-4	1[10]	1[10]	1[10]	1[10]
bis(2-chloromethyl) ether	542-88-1	1[10]	1[10]	1[10]	1[10]
bromobenzene	108-86-1	60	200	550	500
bromodichloromethane	75-27-4	50	150	550	400
bromoform	75-25-2	9	30	85	75
bromomethane	74-83-9	5	15	45	40
butadiene, 1,3-	106-99-0	2[10]	2[10]	3	2.5
carbon disulfide	75-15-0	700	2 000	6 500	5 500
carbon tetrachloride	56-23-5	1.5	5	15	15

OMNIBUS STATISTICS – HOW MANY NEW SUBSTANCES ?

Schedule		Number of New Substances*
X	Soil Part 1 – Matrix Standards (19 new matrices)	8
X	Soil Part 2 – Generic Human Health Standards	113
X	Soil Part 3 – Generic Ecological Health Standards	0
X	Soil Parts 1, 2, 3	**122**
W	Water Standards	4
V	Vapour Standards	0
S	Sediment Standards	0
Total new substances		**126**

*A new substance is a substance that has not previously been prescribed under the CSR

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OMNIBUS STATISTICS – HOW MANY STANDARDS ?

Schedule	Part	Number of Substances	Number of Standards
X Soil	1 matrix	41 (8 new*)	2305
X Soil	2 HH	534 (113 new*)	4272
X Soil	3 EH	535 (0 new*)	552
X Soil	1, 2, 3	**576** (41+ 535)	**7129**
W Water		578 (4 new*)	936
V Vapour		116 (30 unique)	462
S Sediment		33 (6 unique)	132
Total omnibus		**616** (576+4+30+6)	**8659** (7129+936+462+132)

*A new substance is a substance that has not previously been prescribed under the CSR

*A unique substance is a substance that is only prescribed in a single schedule under the CSR

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OMNIBUS STATISTICS - COMPARISON TO EXISTING CSR STANDARDS

Schedule	Type of Standard		↑ % Becoming less stringent	↓ % Becoming more stringent	N/C %
X Soil Part 1	Matrix	Human health	27	50	23
	Matrix	Ecological health	18	23	59
	Matrix	Soil to Groundwater	28	56	16
Part 2	Generic	Human health	24	75	1
Part 3	Generic	Ecological health	5	0	95
W Water	Aquatic Life		8	5	87
	Drinking water		16	19	66
V Vapour	Residential		37	29	34
	Commercial		42	31	27
	Industrial		48	26	26
S Sediment	All standards		0	0	100

*The majority of these substances are extremely uncommon and it is likely that these standards would apply to only a very few sites in BC

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CSAP EXAMPLES OF NEW STANDARDS IMPACTS

Industry Sector	Change/Impact	Positive Advantages	Negative Disadvantages
Gas stations / Parkades 	Less stringent PHC vapour standards Less stringent Parkade vapour standards	Increase in number of PHC sites obtaining standards-based CofCs Parkade standards will reduce/eliminate parkade-related construction constraints and need for RA-based CoCs	Some standards will be more stringent (e.g. soil to groundwater standards) Likely more sites will be assessed using new leachate test procedures
Dry cleaners 	Less stringent TCE vapour standards	New vapour standards will: • Reduce delineation costs and the number of high risk sites • Many notices of off-site migration due to vapours may no longer be required • Many high risk sites will likely be re-classifiable as low risk	Some chlorinated hydrocarbon vapour standards (typically not associated with dry cleaning sites) will become more stringent
Mining / Historic metal sites 	Soil to groundwater standards for several metals will be more stringent	New leachate test procedures will provide relief for many metal sites	More stringent metal standards will likely increase initial scope/scale of metal impacted sites (e.g. mines, smelters, etc.)

OMNIBUS – TWO SEPARATE TYPES OF ORDERS*

Omnibus Updating of CSR:

1. Revised CSR Schedules of Numeric Standards
2. Revised CSR text – various sections

Consequentials to:

Hazardous Waste Regulation

1. Updated - Schedule 1 Dioxin Toxicity Equivalency Factors
2. Updated - Schedule 1.1 PAH Toxicity Equivalency Factors

Organic Matter Recycling Regulation

1. Repeal – Schedule 9 Generic Soil Standards for Cobalt, Molybdenum, Nickel and Selenium Where Managed Organic Matter Has Been Applied
2. Repeal & Replace – New Schedule 10 Matrix Soil Standards for Arsenic, Cadmium, Chromium, Copper, Lead, Mercury (Inorganic) and Zinc Where Managed Organic Matter Has Been Applied

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* Subject to necessary approvals

OMNIBUS – COMING INTO FORCE

CSR Stage 10 Amendment & HWR/OMRR Consequentials

1. Proposed implementation date for orders are identical – i.e. 1 year after approval

Casefile Submission Processing dates (CSAP or MoE)

1. A submission for a numerical CSR instrument received prior to the implementation date for the Stage 10 Amendment will be processed using the old (i.e. existing) CSR standards.

2. A submission for a numerical CSR instrument received after the implementation date for the Stage 10 Amendment will be processed using the new (i.e. omnibus) CSR standards.

OMNIBUS – CASEFILE SUBMISSION DATES

Casefile Submission Processing dates (CSAP or MoE)

1. All submissions must be complete and of required quality.
2. Director may reject submissions that are incomplete or not of required quality.
3. Submissions based on new standards will be processed after new standards take legal effect (i.e. after end of omnibus transition period).
4. Submissions will be processed in the order received.

OMNIBUS – CASEFILE SUBMISSION DATES

Casefile Submission Processing dates (CSAP or MoE)

Ministry Review times

Ministry review/approval of high risk site submissions may take up to 6- 8 months

CSAP Review times

CSAP review/recommendation to approve low risk site submissions may take up to 3-4 months

OMNIBUS PHASE 2 – TRANSITION PERIOD

Protocol Updating

Need to Draft*:

1. Consolidated 2016 Updated CSST Protocol
2. New Protocol "C27" – Leachate testing procedures

Need to Update:

1. CSR Protocol 02 – Site Specific Numerical Soil Standards
2. CSR Protocol 11 – Upper Cap Concentrations for Substances
3. CSR Protocol 13 – Screening Level Risk Assessment

*There is also a need to draft a new Administrative Bulletin – Update for CSR Instrument Submission Dates and Submission Completion and Quality Requirements

OMNIBUS PHASE 2 – TRANSITION PERIOD

Technical Guidance Updating

Need to Update:

1. CSR TG 03 – Environmental Quality Guidelines
2. CSR TG 04 – Vapour Investigation and Remediation
3. CSR TG 07 – Supplemental Guidance for Risk Assessment
4. CSR TG 09 – Chlorophenol Aquatic Life Water Quality Standards
5. CSR TG 13 – Groundwater Model (version 2009)
6. CSR TG 17 – Background Soil Quality Database

Need to Repeal:

1. CSR TG 19 – Assessing and Managing Contaminated Sediments

OMNIBUS PHASE 3 – NEXT CYCLE

Protocol Updating

Need to Update:

1. CSR Protocol 04 – Determining Background Soil Quality
2. CSR Protocol 10 – Hardness Dependent Site-specific Freshwater Standards for Cadmium and Zinc
3. CSR Protocol 18 – Criteria for Establishing Multiple Land Uses at Sites
4. CSR Protocol 20 – Detailed Ecological Risk Assessment Requirements

OMNIBUS PHASE 3 – NEXT CYCLE

Technical Guidance Updating

Need to Update:

1. CSR TG 11 – Checklist for Reviewing a Detailed Site Investigation
2. CSR TG 15 – Concentration Limits for the Protection of Aquatic Receiving Environments
3. CSR TG 16 – Soil Sampling Guide for Local Background Reference Sites
4. CSR TG 19 – Assessing and Managing Contaminated Sediments
5. CSR TG 24 – Groundwater Modeling User Guides

QUESTIONS ?

GLYN FOX

GLYN.FOX@GOV.BC.CA OR (250) 356-8374

2:15 – 2:30

COFFEE BREAK

WATER POLICY UPDATE

CSAP Annual General Meeting
June 8, 2016

Peggy Evans
Manager, Risk Assessment and Remediation

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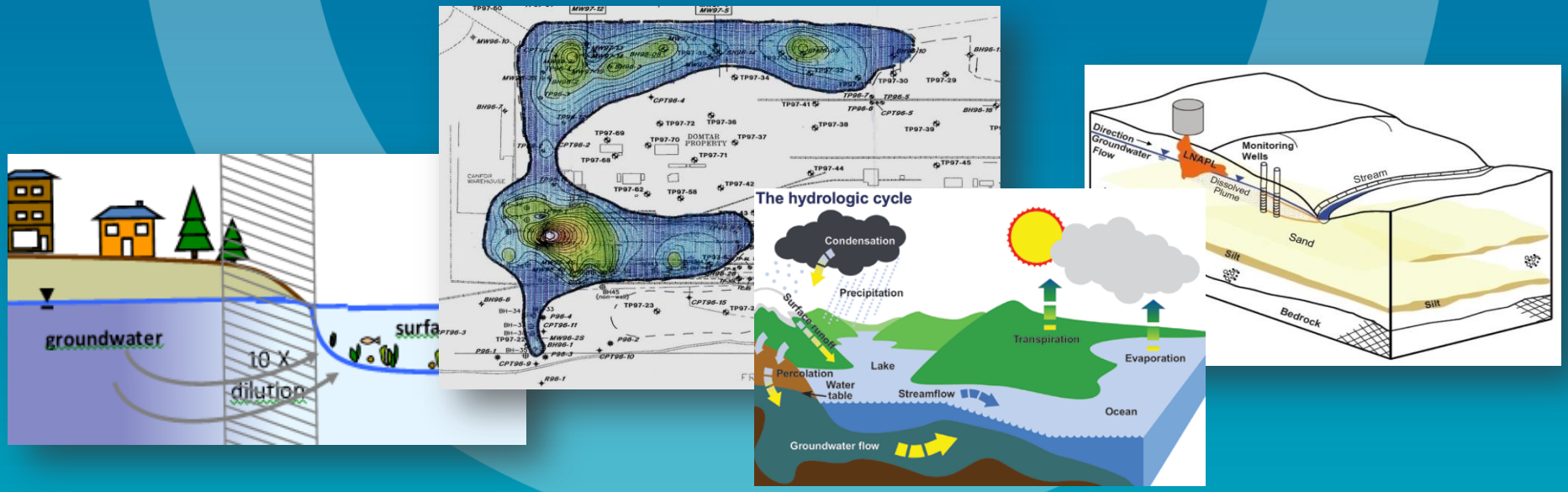
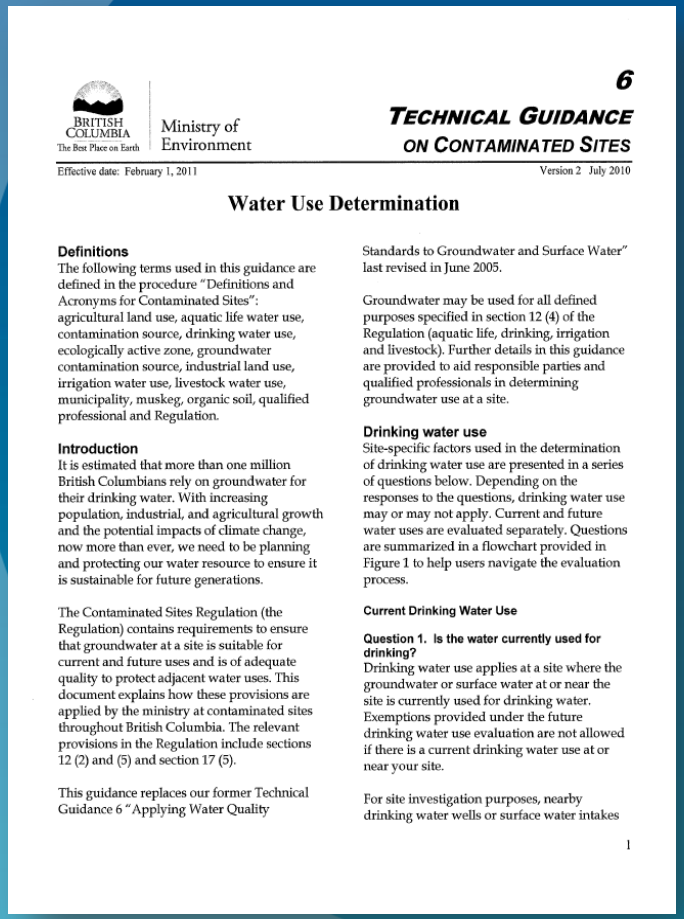
OUTLINE

- Protocol 21 – Determining Water Use
- Groundwater Mapping
- Draft Protocol 5 - Groundwater Remediation
- Draft Technical Guidance 22



PROTOCOL 21 – WATER USE DETERMINATION



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TECHNICAL GUIDANCE ON CONTAMINATED SITES

Effective date: February 1, 2011 Version 2 July 2010

Water Use Determination

Definitions
The following terms used in this guidance are defined in the procedure "Definitions and Acronyms for Contaminated Sites": agricultural land use, aquatic life water use, contamination source, drinking water use, ecologically active zone, groundwater contamination source, industrial land use, irrigation water use, livestock water use, municipality, muskeg, organic soil, qualified professional and Regulation.

Introduction
It is estimated that more than one million British Columbians rely on groundwater for their drinking water. With increasing population, industrial, and agricultural growth and the potential impacts of climate change, now more than ever, we need to be planning and protecting our water resource to ensure it is sustainable for future generations.

The Contaminated Sites Regulation (the Regulation) contains requirements to ensure that groundwater at a site is suitable for current and future uses and is of adequate quality to protect adjacent water uses. This document explains how these provisions are applied by the ministry at contaminated sites throughout British Columbia. The relevant provisions in the Regulation include sections 12 (2) and (5) and section 17 (5).

This guidance replaces our former Technical Guidance 6 "Applying Water Quality Standards to Groundwater and Surface Water" last revised in June 2005.

Groundwater may be used for all defined purposes specified in section 12 (4) of the Regulation (aquatic life, drinking, irrigation and livestock). Further details in this guidance are provided to aid responsible parties and qualified professionals in determining groundwater use at a site.

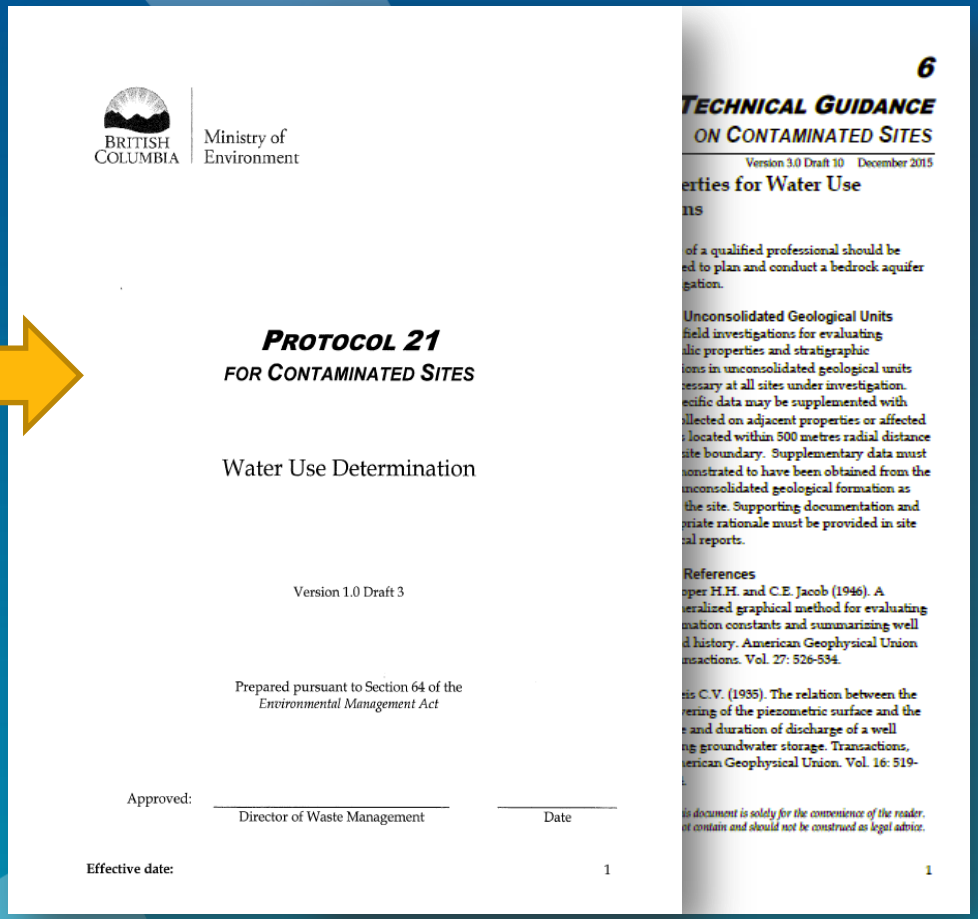
Drinking water use
Site-specific factors used in the determination of drinking water use are presented in a series of questions below. Depending on the responses to the questions, drinking water use may or may not apply. Current and future water uses are evaluated separately. Questions are summarized in a flowchart provided in Figure 1 to help users navigate the evaluation process.

Current Drinking Water Use

Question 1. Is the water currently used for drinking?
Drinking water use applies at a site where the groundwater or surface water at or near the site is currently used for drinking water. Exemptions provided under the future drinking water use evaluation are not allowed if there is a current drinking water use at or near your site.

For site investigation purposes, nearby drinking water wells or surface water intakes

1



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PROTOCOL 21 FOR CONTAMINATED SITES

Water Use Determination

Version 1.0 Draft 3

Prepared pursuant to Section 64 of the *Environmental Management Act*

Approved: _____ Director of Waste Management _____ Date

Effective date:

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TECHNICAL GUIDANCE ON CONTAMINATED SITES

Version 3.0 Draft 10 December 2015

erties for Water Use
ns

of a qualified professional should be
ed to plan and conduct a bedrock aquifer
gation.

Unconsolidated Geological Units
field investigations for evaluating
lic properties and stratigraphic
ions in unconsolidated geological units
essary at all sites under investigation.
ecific data may be supplemented with
llected on adjacent properties or affected
located within 500 metres radial distance
ite boundary. Supplementary data must
onstrated to have been obtained from the
nconsolidated geological formation as
the site. Supporting documentation and
priate rationale must be provided in site
al reports.

References
per H.H. and C.E. Jacob (1946). A
eralized graphical method for evaluating
nation constants and summarizing well
d history. American Geophysical Union
nsactions. Vol. 27: 526-534.

is C.V. (1935). The relation between the
ering of the piezometric surface and the
and duration of discharge of a well
ng groundwater storage. Transactions,
erican Geophysical Union. Vol. 16: 519-

is document is solely for the convenience of the reader.
ot contain and should not be construed as legal advice.

1

July 2010

December 2015

PROTOCOL 21 – WATER USE DETERMINATION

Protocol 21 provides criteria for determining water uses and water standards for assessing contamination at sites

Water Uses (CSR 12(4)):

Drinking water (DW)

Irrigation (IW)

Livestock (LW)

Aquatic life (AW)

No Specified Use

Factors considered in determining water use (CSR 12(2) & (4)):

- Current and reasonable potential future use
- Protection for use at a site and on neighbouring lands
- Prevention of pollution
- Policies of government or municipality

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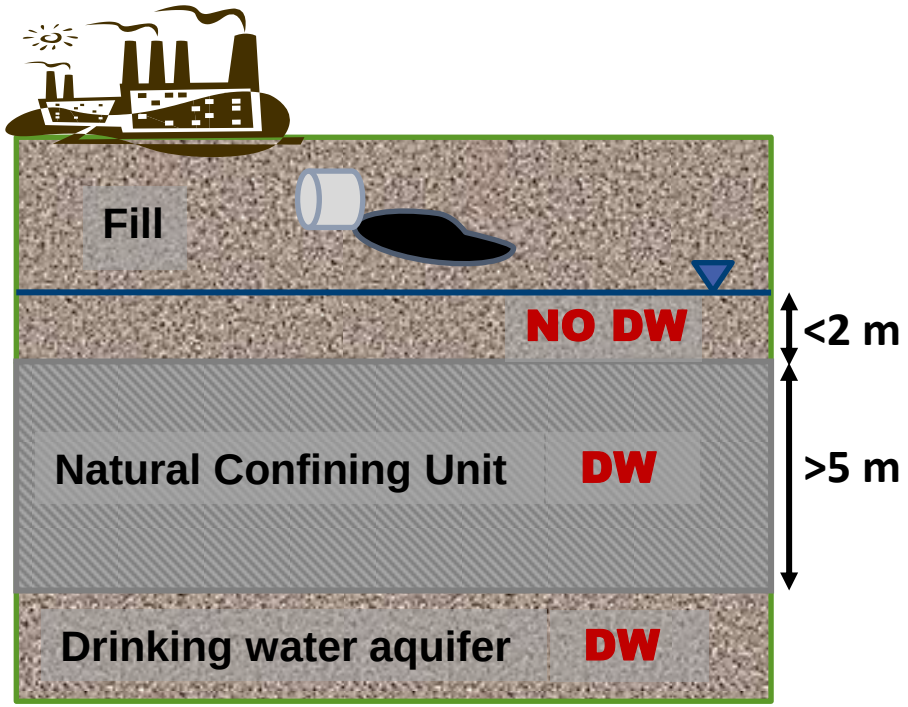
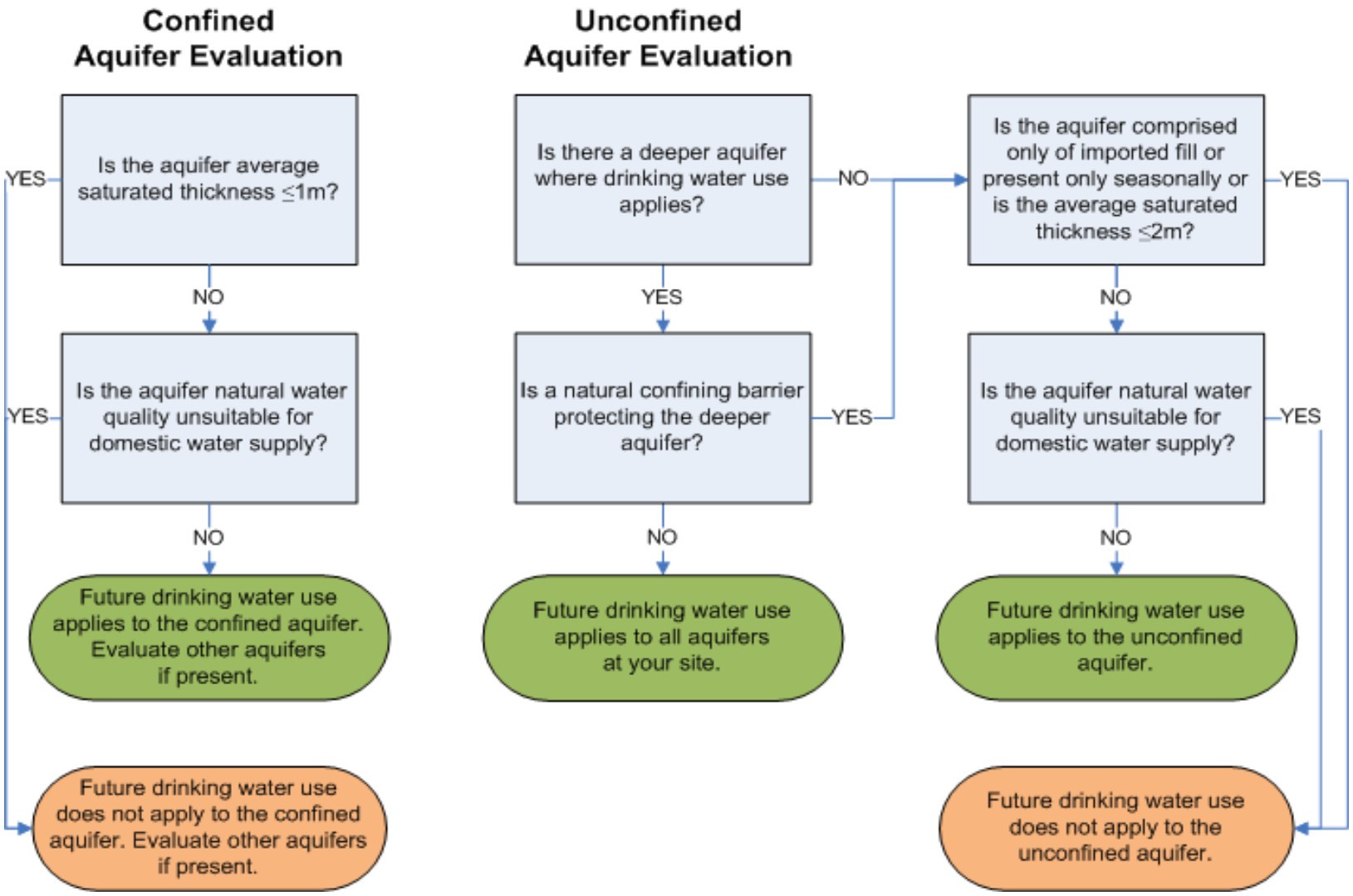
TECHNICAL GUIDE 6 TO PROTOCOL 21 – CHANGES

TG6 ⇨ **P21**

- **Shallow aquifers** – greater relief
  - Saturated thickness < 2m
  - Composed of fill
- **Irrigation & Livestock water**
  - based on current use only
- **Bedrock water**
  - Mapped aquifers **–>** DW
  - Yield data required
  - Use of bedrock data within 500 m
- **Natural confining units** – expanded scope
  - equivalent thickness allowed
  - free of contamination (soil only if soil standards)
- **Filled marine & estuarine foreshore –>** no DW



PROTOCOL 21 – FUTURE DRINKING WATER USE



PROTOCOL 21 – FILLED MARINE & ESTUARINE EXEMPTION

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PROTOCOL 21 – DIRECTOR`S DETERMINATIONS

Determinations under Protocol 21

Relief from specific water uses determined under P21 based on site-specific data

↓

Data and arguments presented in DSI & summarized in SoSC in CS instrument application

Director's Determinations

No relief from specific water uses determined under P21 based on site-specific data but water use(s) is unlikely or unreasonable to anticipate

↓

Data and arguments presented in application for Director's determination of water use (Appendix 1)

PROTOCOL 21 – STATUS & WHAT'S NEXT

2016 to date

- 4 applications for Director`s Determinations (down from 2015)

2016/2017

- Monitor the effect of changes in Protocol 21 on sites in BC
- Capture data from no DW use sites for mapping initiatives
- Process Director's Determinations of Water Use

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GROUNDWATER MAPPING

Groundwater mapping to support determinations of water use

- Short term: hydrogeological data to augment site-specific determinations:
  - Presence of drinking water aquifers
  - Presence of natural confining barriers
- Long term: geographic limits of DW and no DW use areas (target areas)
- Benefits
  - Consistent application of water standards
  - Reduced time & cost of environmental investigations

Available Mapping

- **MOE – WELLS database and aquifer mapping on iMapBC**
- **MOE – Langley pilot DW use mapping** (extraction from WELLs database)
- **MOE – Borehole lithology mapping on iMapBC** (Lower Mainland)
- **CSAP – Contaminated Sites Legal Instrument Mapping**

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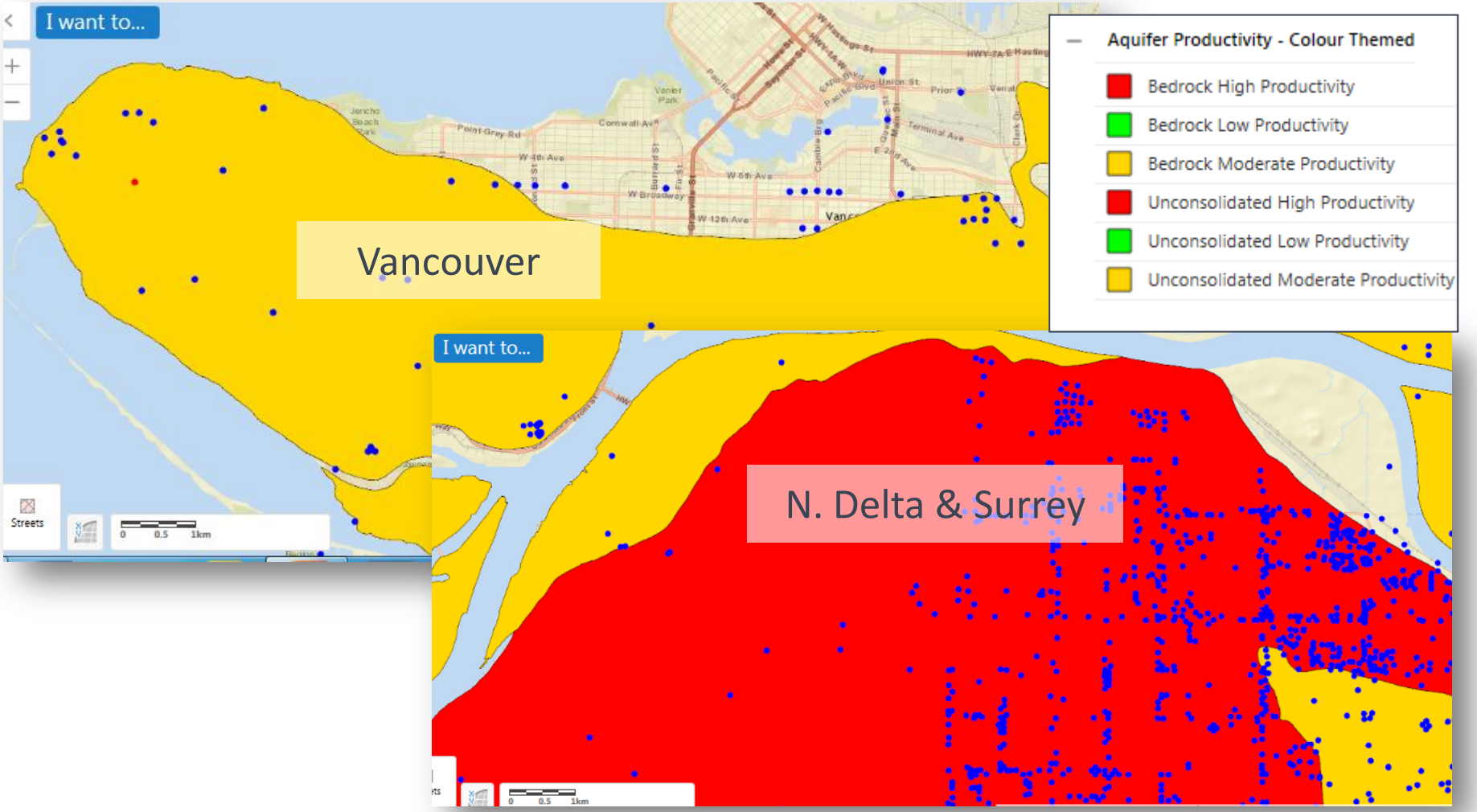
GROUNDWATER MAPPING – WELLS & AQUIFERS

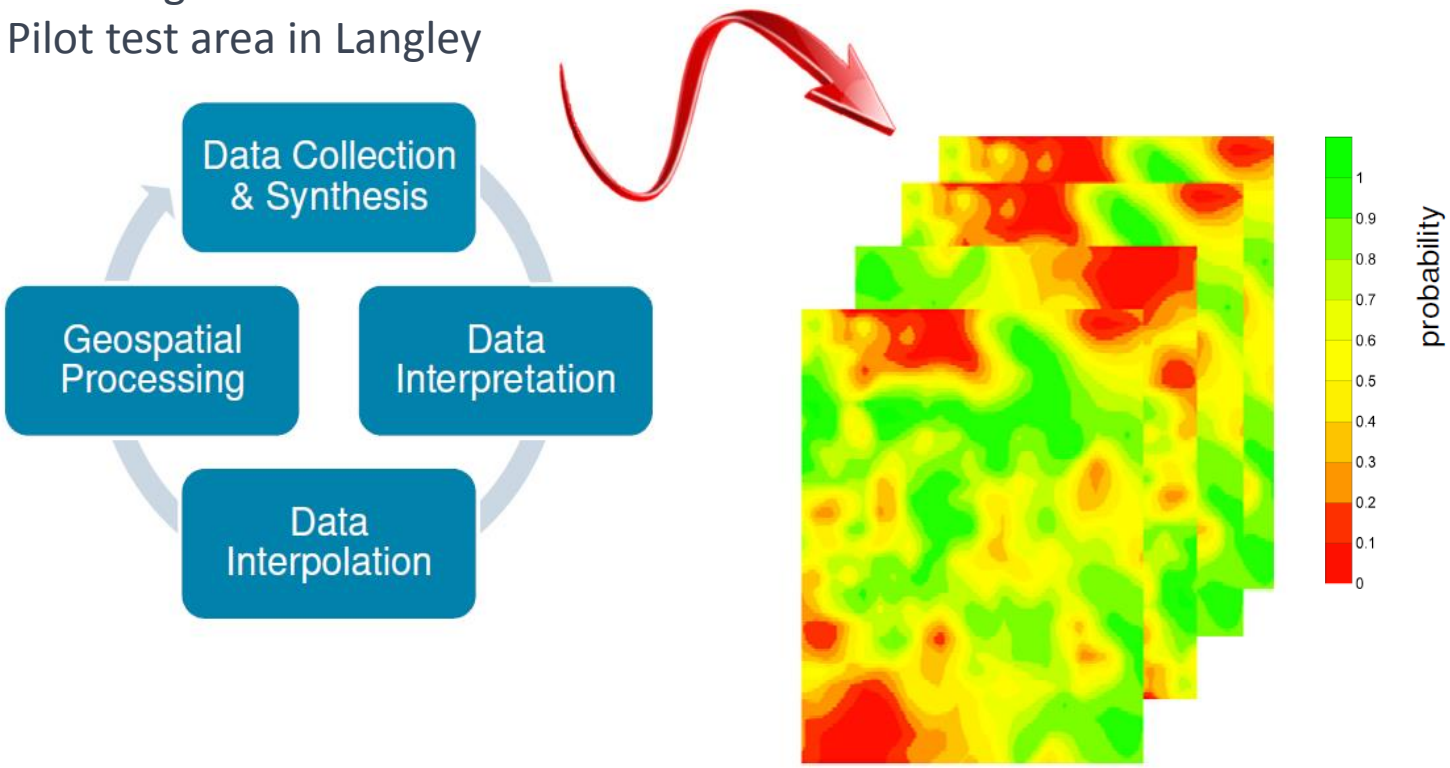
Aquifer Mapping – iMapBC



GROUNDWATER MAPPING – LANGLEY DW USE PILOT

Drinking water use mapping

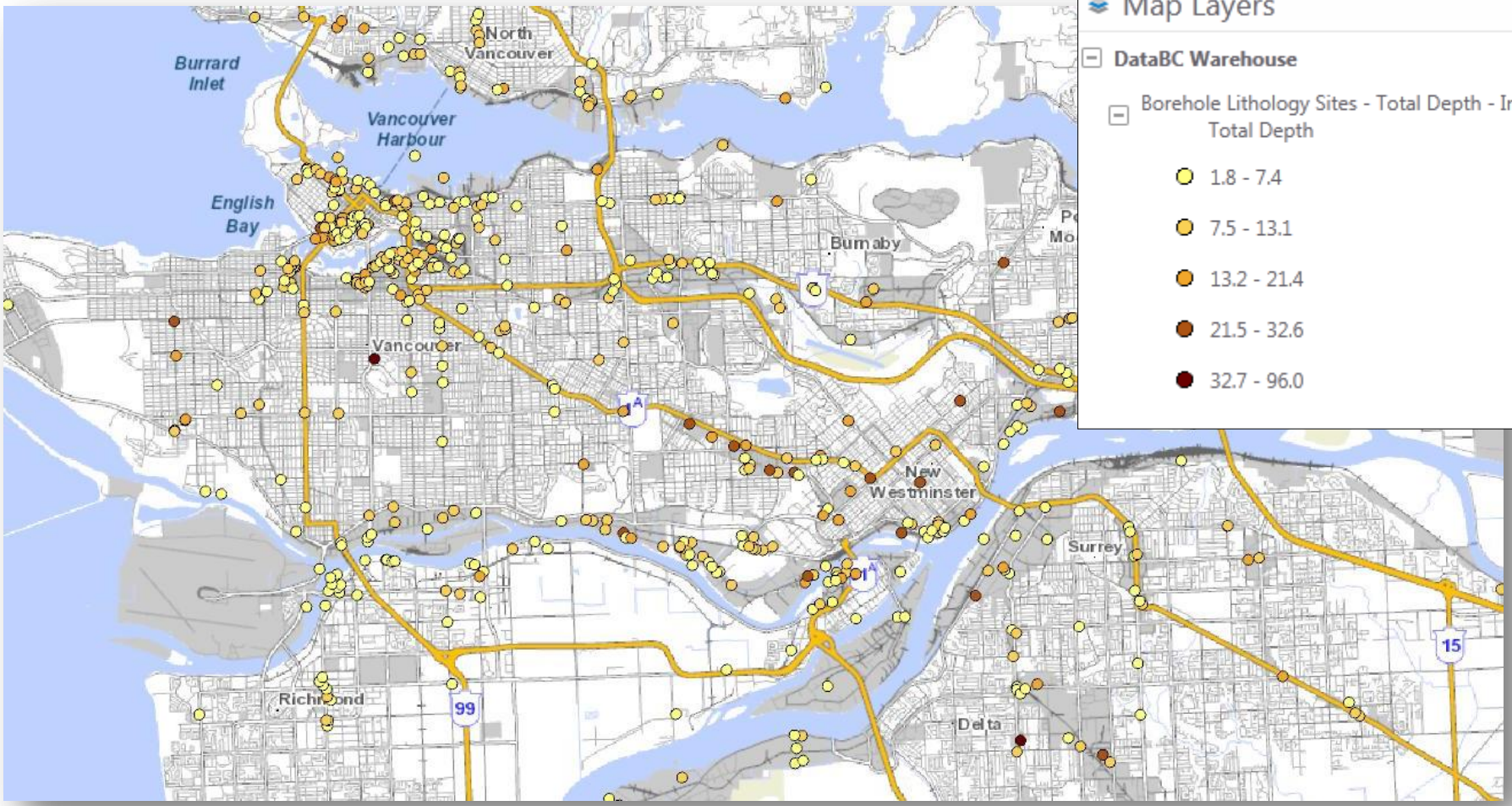
- MoE Drinking Water Use Determination Mapping (Worley Parsons)
  - WELLS Database
  - Geospatial processing to identify probability of drinking water aquifers/natural confining barriers
  - Pilot test area in Langley



GROUNDWATER MAPPING – CS BOREHOLE LITHOLOGY

Borehole Lithology

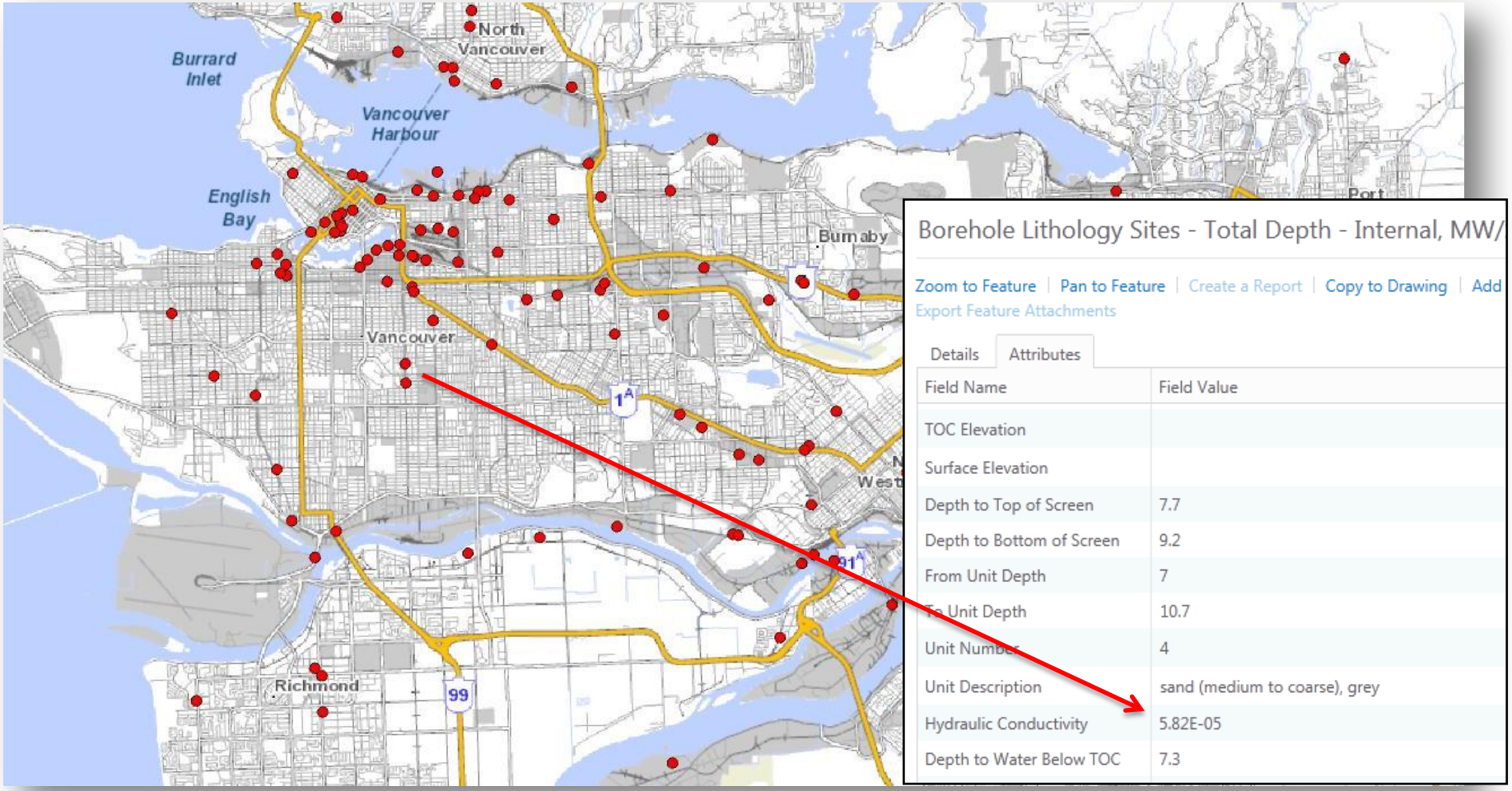
- >900 contaminated sites borehole logs in Lower Mainland



GROUNDWATER MAPPING – CS BOREHOLE LITHOLOGY

Borehole Lithology

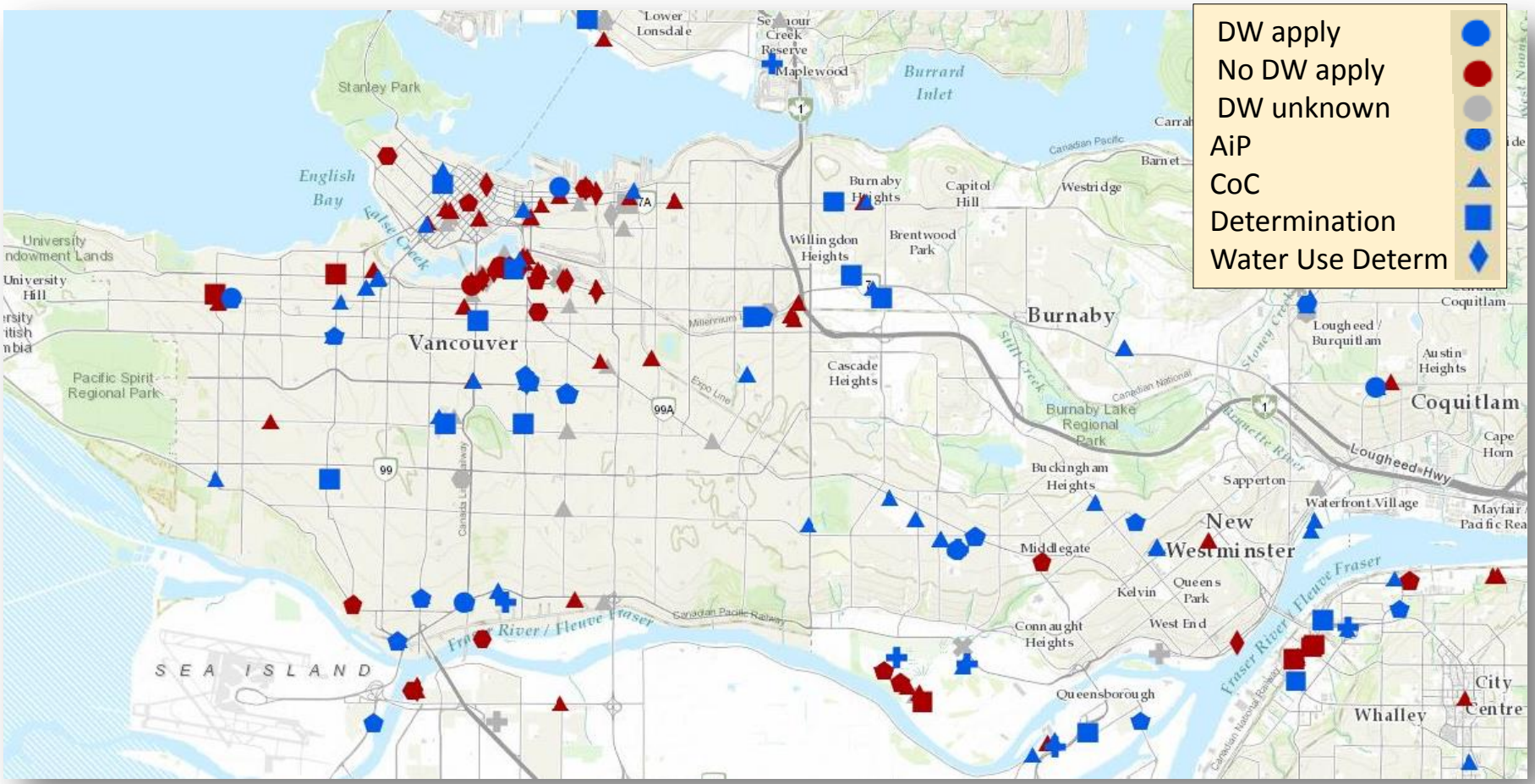
- >215 borehole logs with hydraulic conductivity values



GROUNDWATER MAPPING – CSAP MAPPING

CSAP Contaminated Sites Legal Instrument Mapping

- Map of drinking water use from MoE Legal Instruments



GROUNDWATER MAPPING – STATUS & WHAT'S NEXT

2016

- Borehole logs now submitted with instrument applications

2016/2017 & beyond

- Upload BH logs onto the Borehole Lithology layer on imap.
- Data sharing with MOE Water Protection and Sustainability Branch (consolidation of WELLS and BH Lithology)
- Exploring partnerships for mapping pilot – e.g. Downtown Vancouver

DRAFT PROTOCOL 5 – GROUNDWATER REMED'N REQUIREMENTS

Draft Protocol 5 provides requirements for remediating groundwater at sites where drinking, irrigation or livestock water uses apply

Selection of remediation options (EMA 56(1)):

Remediation must give preference to alternatives that provide *permanent solutions to the maximum extent practicable,* taking into account factors such as:

a) Risks to human health or the environment;
b) Technical feasibility and risks of remediation;
c) Remediation costs and potential economic benefits, costs & effects;
d) other prescribed factors.

Groundwater Sustainability

- Living Water Smart (2008)
- Water Sustainability Act (2014)
  - Water Objectives

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DRAFT PROTOCOL 5 – POLICY INTENT

Policy Intent

- Ensure remediation of viable aquifers to the extent practical to support applicable water uses.

"Remediation concentration goal" (Procedure 8 – Definitions & Acronyms)

A concentration of a substance in soil, water, sediment or vapour which must be met in order for a site to be considered to meet the remediation standards of the CSR and includes:

- a numerical standard
- a site-specific numerical standard
- a background concentration
- a site-specific risk-based concentration (back-calculated concentration assuming complete exposure pathways)

DRAFT PROTOCOL 5 – PROCESS

Contaminated Groundwater

Administrative Controls

Usable Groundwater

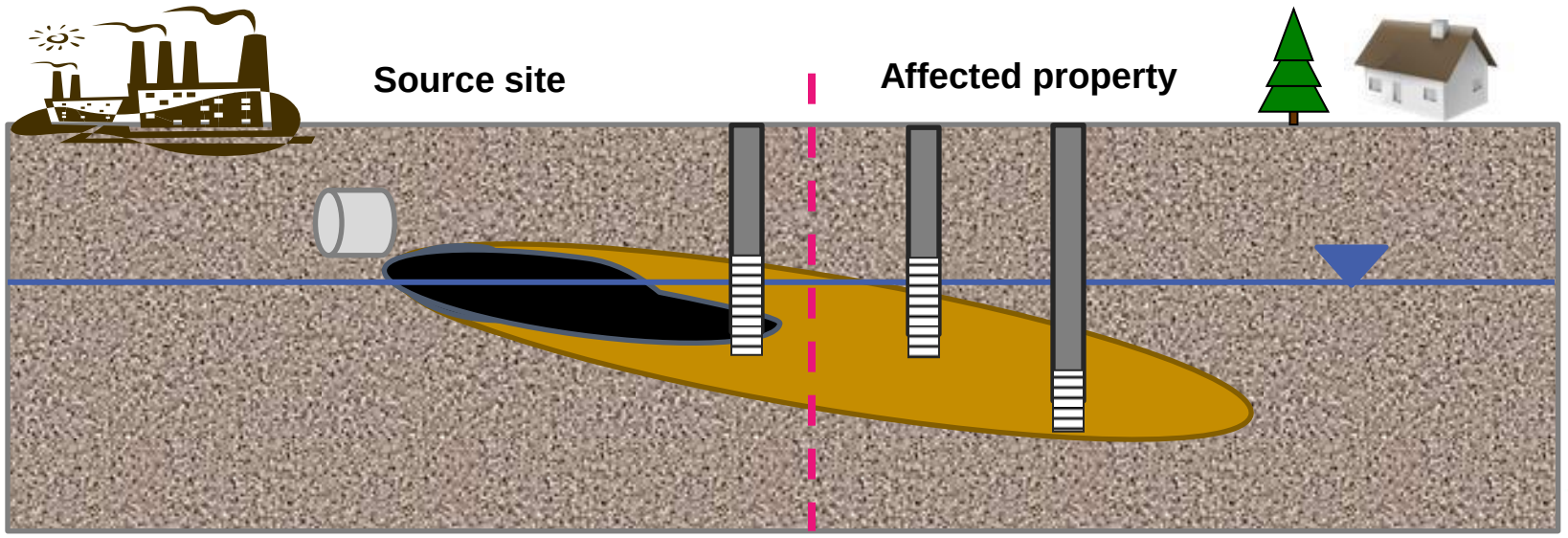
DRAFT PROTOCOL 5 – REMEDIATION STRATEGIES

Short-term Remediation Strategy – current use/no affected supply wells

- Remediate contamination source and plume to meet the remediation concentration goals for the entire site within 5 years of issuance of an AIP or COC or as quickly as practicable thereafter

Long-term Remediation Strategies (A & B) – viable aquifers

- Remediate contamination source and plume to meet the remediation concentration goals for the entire site (A) or for affected properties (B) within **20 years** of issuance of an AIP or COC



DRAFT PROTOCOL 5 – DIRECTOR'S DECISION

Long-term Remediation Strategy (C)

- Request approval from a Director to implement an alternative remediation strategy
- Not feasible to implement remediation strategy A or B
- Technical &/or cost impracticality is established through a *feasibility assessment*
- Remediation of contamination source to maximum extent practical

Limited Use Aquifer

Eligibility Criteria

- Marginal aquifers with no current use & limited potential for future use
- Petroleum hydrocarbons (<10 X DW stds) with demonstrated degradation trend

Relief

- Early closure on long term monitoring
- Permanent closure by institutional controls (e.g. GW must not be used for drinking)

DRAFT PROTOCOL 5 – STATUS & WHAT'S NEXT

2015/2016

- CSAP Working Group Recommendations
- Internal LRS – WPSB Policy Coordination (EMA and WSA)

2016/2017 & beyond

- Finalize Draft Protocol for public comment
- Water objectives development under WSA (WPSB)

Issues

- Remediation strategies
- Uncertainty
- Limited Use Aquifer
- Technical impracticality (20 year timeframe)
- Feasibility assessment guidance (Draft Technical Guidance 21)
- CSR instrument approval – AiP or CoC

DRAFT TECH GUIDE 22: USE OF MONITORED ATTENUATION

Draft Technical Guidance 22 provides guidance for remediating groundwater using monitored natural attenuation (MNA) and enhanced attenuation (EA)

"remediation" means action to eliminate, limit, correct, counteract, mitigate or remove any contaminant…..and includes:

- monitoring, verification and confirmation of whether the remediation complies with applicable standards and requirements imposed by a director (EMA, (1))

Protocol 5 – MNA and EA are viable remediation methods for groundwater

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DRAFT TECH GUIDE 22: USE OF MONITORED ATTENUATION

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22

TECHNICAL GUIDANCE ON CONTAMINATED SITES

Version 1.0 Draft 15 November 2014

Using Monitored Natural Attenuation and Enhanced Attenuation for Groundwater Remediation

This document provides guidance on the use of monitored natural attenuation (MNA) and enhanced attenuation (EA) for the remediation of contaminated groundwater in B.C.

Definitions

Acronyms and terms used in this guidance are defined in the ministry's Procedure 8, "Definitions and Acronyms for Contaminated Sites":

Act
Approval in Principle
Certificate of Compliance
enhanced attenuation
independent remediation
natural attenuation
monitored natural attenuation
performance verification plan
Regulation
remediation concentration goal
site-specific risk-based concentration

Monitored natural attenuation

MNA is a passive approach to remediation that monitors natural attenuation processes which reduce the levels of contaminants and bring contaminated environmental media into compliance with the remediation standards of the Contaminated Sites Regulation (the Regulation).

Natural attenuation

Natural attenuation refers to a variety of physical, chemical, or biological processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil, sediment or groundwater.

The effectiveness of natural attenuation is determined by the rate of contaminant loading versus the rate of contaminant attenuation. When natural attenuation is not effective within a reasonable time frame, enhanced attenuation may be a viable alternative remedial strategy.

Enhanced attenuation

Enhanced attenuation refers to any type of intervention used to sustainably increase the magnitude of remediation occurring by natural attenuation. EA includes both chemical and biological enhancement techniques.

Chemical enhancement

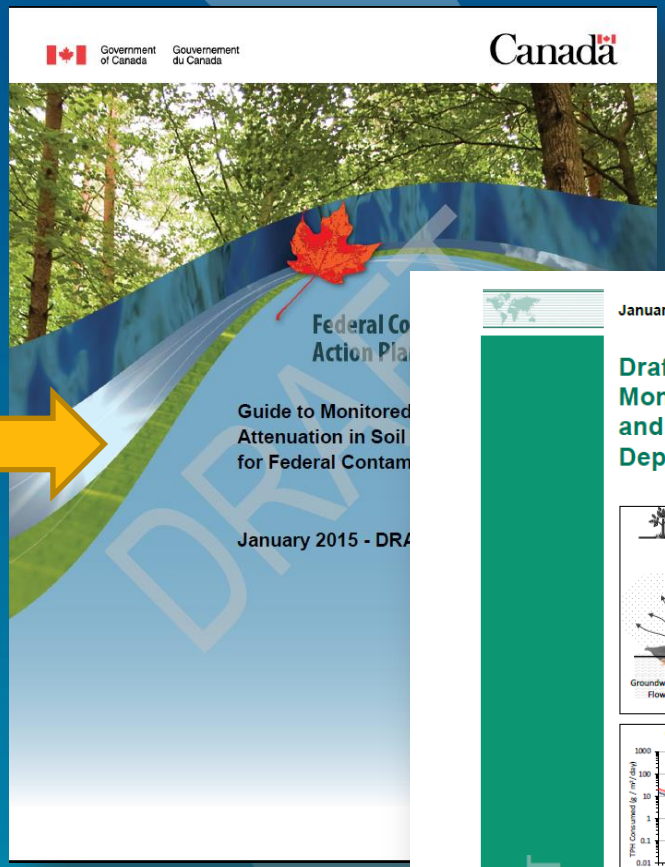
Supplementing the hydrogeological system with additional electron acceptors and donors can enhance and maintain biological degradation processes by:

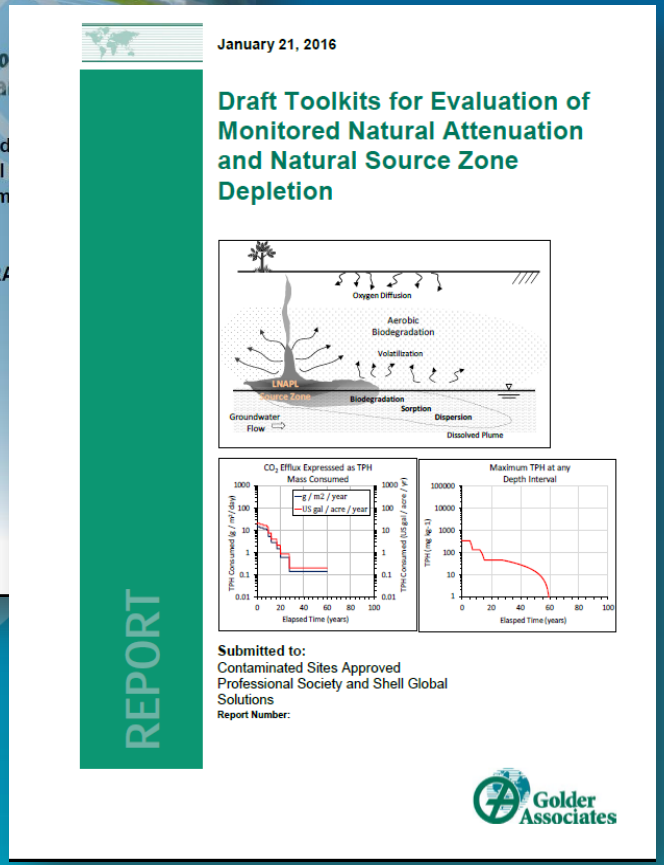
- Increasing the availability of electron acceptors (e.g., dissolved oxygen, nitrate, and sulphate) to facilitate the breakdown of substances amenable to aerobically mediated degradation (e.g., petroleum hydrocarbons), or
- Increasing the availability of electron donors (e.g., hydrogen, carbohydrates, fatty acids) to facilitate the breakdown of substances amenable to anaerobically mediated degradation (e.g., chlorinated organics).

Biological enhancement

Bioaugmentation can be used to supplement the natural biological capacity and longevity within the source-plume system by:

- Adding nutrients (e.g., nitrogen, phosphorus, trace minerals, and vitamins) to stimulate the naturally occurring bacteria/microorganisms, and
- Adding species of microorganisms that are not naturally present in the hydrogeological system, but are necessary to facilitate biodegradation.





November 2014

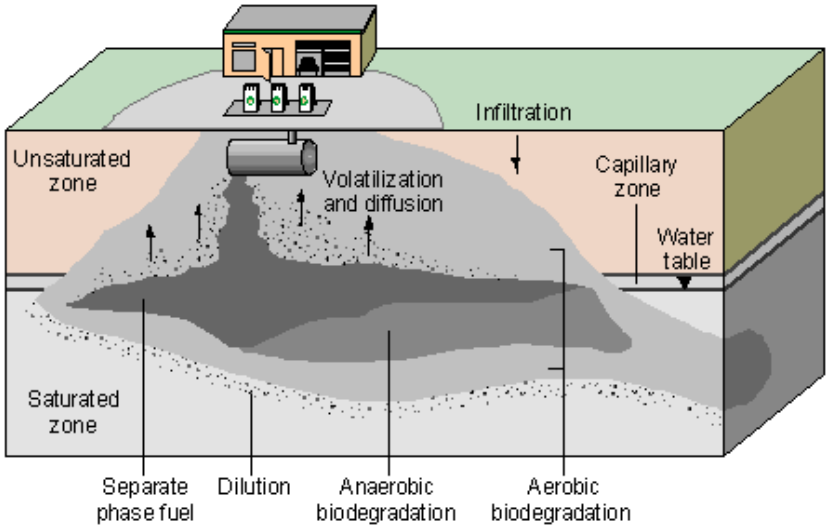
TECHNICAL GUIDANCE 22 – SELECTION OF MNA OR EA

Monitored Natural Attenuation or Enhanced Attenuation can be used alone or in conjunction with other remediation measures

- Source removal/control
- Hydraulic control
- Groundwater extraction
- Reactive barriers

Supplemental guidance for MNA/EA

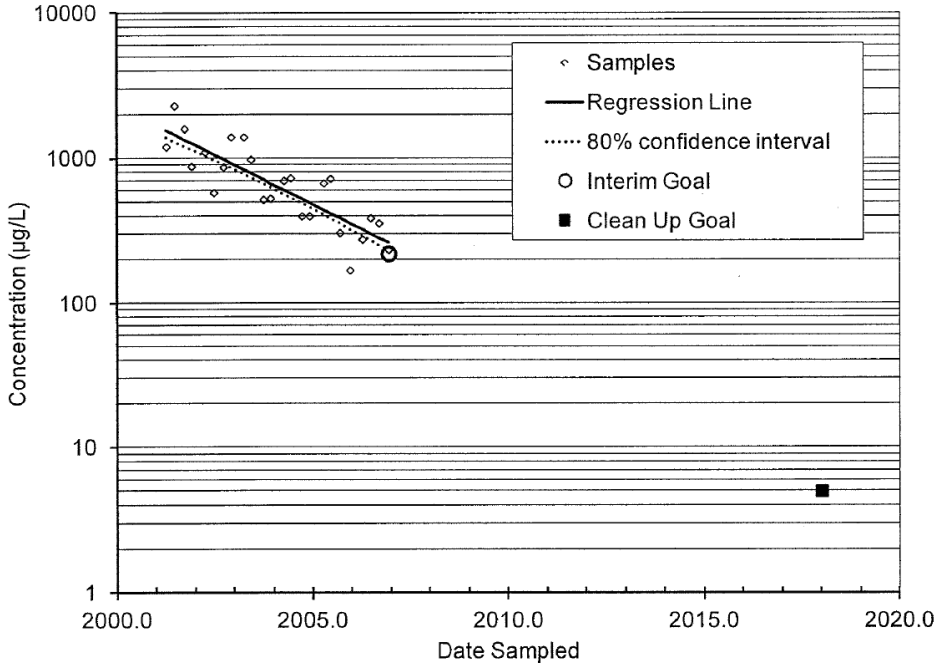
- TG22 is not prescriptive
- Incorporate other guidance
  - e.g., EPA, ITRC, Golder Toolkits



TECHNICAL GUIDANCE 22 – CONDITIONS OF USE

MNA and EA conditions

- No unacceptable risks to human health or the environment
- Groundwater contamination sources are remediated or contained
- Groundwater contamination is shrinking
- MNA/EA will achieve the *remediation concentration goal* within 20 years
- Long term performance monitoring and validation
- Contingency plan with implementation trigger(s) & response



DRAFT PROTOCOL 5 – STATUS & WHAT'S NEXT

2015/2016

- CSAP Draft Toolkit Development (ministry participation)
- Federal Govt Guide to Monitored Natural Attenuation of federal sites

2016/2017

- Revise Draft Guidance for public comment

THANK YOU

peggy.evans”gov.bc.ca

2016 Site Remediation in B.C. Conference

September 21st -22nd, 2016, Vancouver Convention Centre

siteremediationinbc.com

Thank You

Workshop presentations will be posted at the CSAP Society website:

http://csapsociety.bc.ca/about

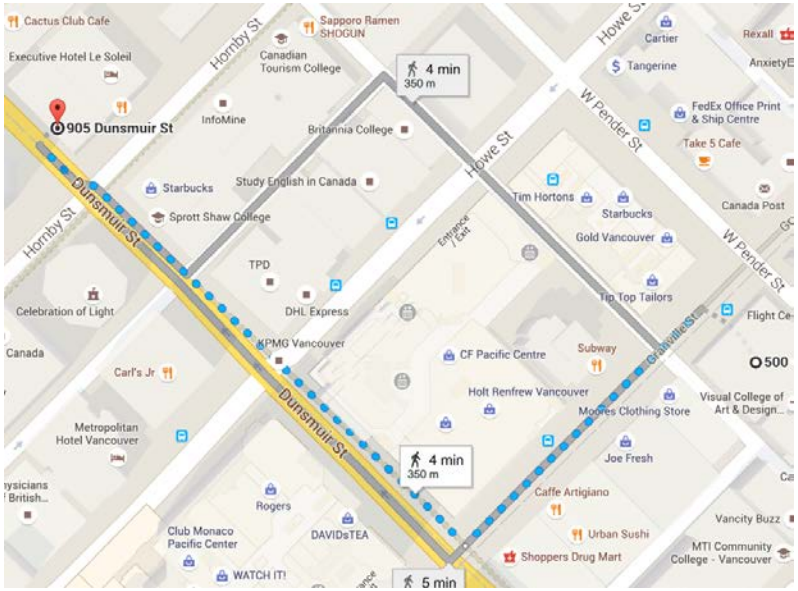
CSAP
Society of Contaminated Sites Approved Professionals of British Columbia

No host happy hour

The Blackbird Public House

905 Dunsmuir St., Vancouver

[Upstairs]



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