BRITISH COLUMBIA
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Ministry of Forests, Lands
and Natural Resource Operations

WSA and Groundwater

BCGWA 2016

Representatives Here Today

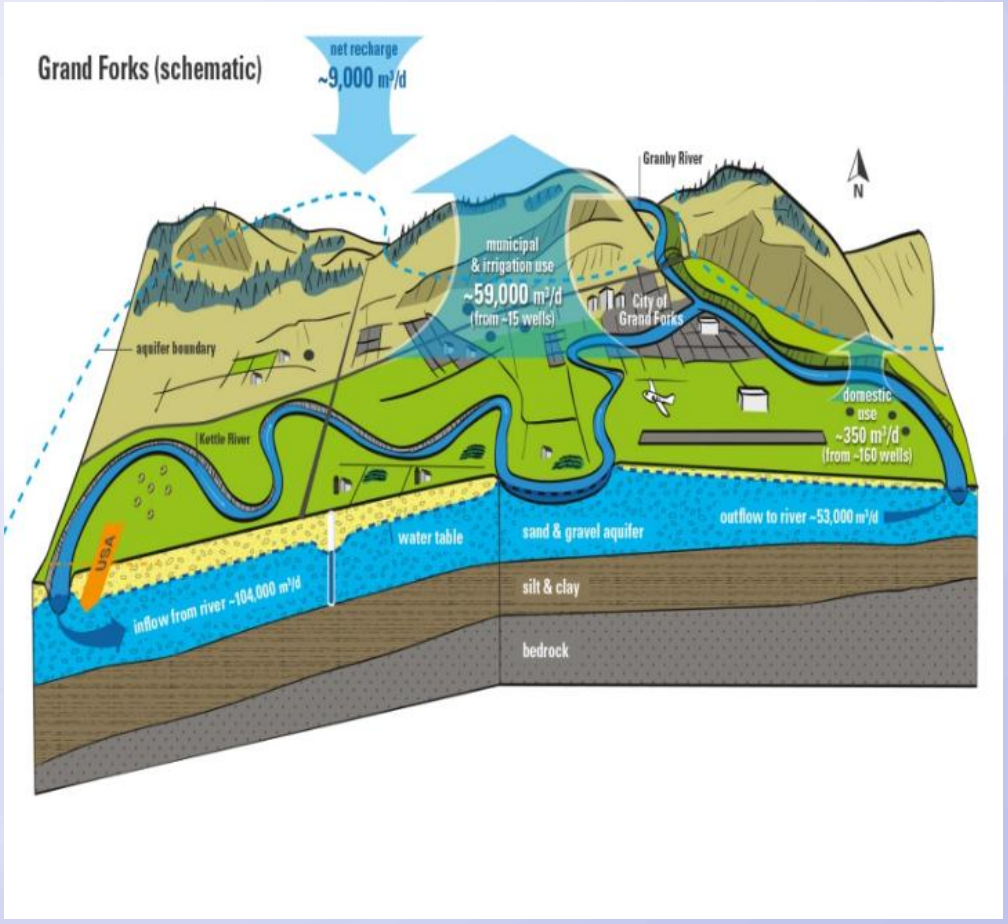
- Ross Kreye, Section Head
  Groundwater Authorizations
- Mike Simpson,
  Regional Hydrogeologist

Outline

- Water Sustainability Act and GW Licensing Update
- Groundwater Protection Regulation
- Other initiatives

Water Sustainability Act (WSA)

- Enacted February 29, 2016
- Ensure water now and in the future
- Managing groundwater and surface water as one resource
- Environmental Flow Needs
- Groundwater licensing



Water Sustainability

- Water licensing, diversion & use of water
- Transition of existing groundwater use
- Changes in & about a stream
- Use of water for well drilling
- Use of deep groundwater

Fees, Rentals & Charges Tariff

- Fees & rentals schedule
- Exemptions from fees & rentals
- Administration of fees & rentals

Groundwater Protection

- Registration of well drillers & well pump installers
- Well construction & identification
- Well pumps & related works
- Well operation & maintenance
- Well deactivation & decommissioning
- Well Reports

Dam Safety

- Dam failure consequence classification
- Responsibilities of dam owners
- Operation & maintenance
- Dam monitoring & safety review
- Emergency plans

Regulations to Come

- Measuring and reporting
- Livestock watering
- Water Sustainability Plans
- Dedicated agricultural water
- Water objectives
- Designated areas for domestic groundwater licensing
- Licence reviews
- Alternative governance approaches

Licensing Wells

- Domestic use exempt
- Non-domestic – irrigation, industrial, waterworks, etc. will need a license
  - Both existing and new wells
- Similar licensing scheme as for surface water – fees, rentals
- FITFIR model
- Recognize hydraulic connection between surface water and groundwater (i.e. consider long term effects of well pumping on streams)

"Non-domestic"

- All non-domestic wells require a license
- "domestic":
  - household purposes (drinking, cleaning, food prep, etc)
  - Watering animals kept as pets or for household use
  - Irrigation of garden < 1,000 m^2 (0.25 acre)

Existing vs. New

- Existing (well in use pre-Feb 29, 2016) vs new wells
- Existing wells:
  - have until March 1, 2019 to apply for a license
  - can use the water in the meantime
  - until March 1, 2017 the application fee is waived ($250 to $10,000)
  - date of precedence based on date of first use
  - post March, 2019: priority rights are lost
  - water rental fees begin the date the *WSA* comes into force (February 29, 2016)
- New wells: can't use the water until a license is granted

Fees and Rentals

Example User	Volume (1000m3 /year)	Annual water rental ($)	Application Fee ($)
50 acres of blueberries drip irrigation	92	78	250
100 head of dairy cattle	5	50	250
Water bottler	200	450	5000
Municipal water supply	23,000	52,000	10,000

Water Rent Calculator

Agriculture Water Calculator

FLNRO Regional Outreach Activities

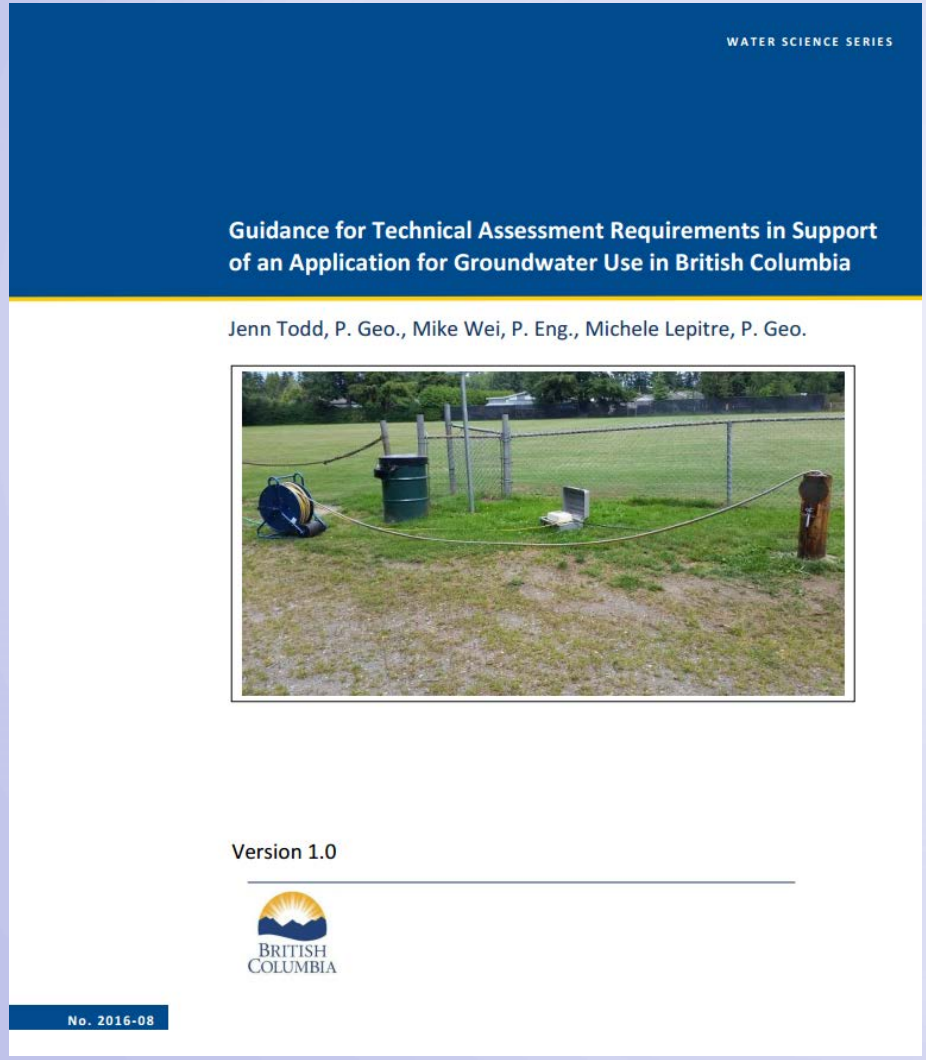
- Presentations
  - First Nations
  - Coast and Fraser Health Authorities
  - BCIA
- Mail outs to ~560 Small water systems
- Emails to local government departments
- Agriculture Water Forums
  - Richmond, Abbotsford
  - Ag Trade Show (January)

Types of Applications being received

- Waterworks
  - Local government
  - Smaller systems
- Water Bottling
- Irrigation
- Stock Watering
- Camps/public facilities; golf courses; water delivery

Some early challenges for licensing

- Bedrock aquifers
- Unmapped aquifers
- Connectivity and Environmental Flow Needs
- Salt water intrusion
- Artesian areas
- Notifications (proximity to proposed licence)
- Adequate technical information
- Low application rate



Tech Assessment

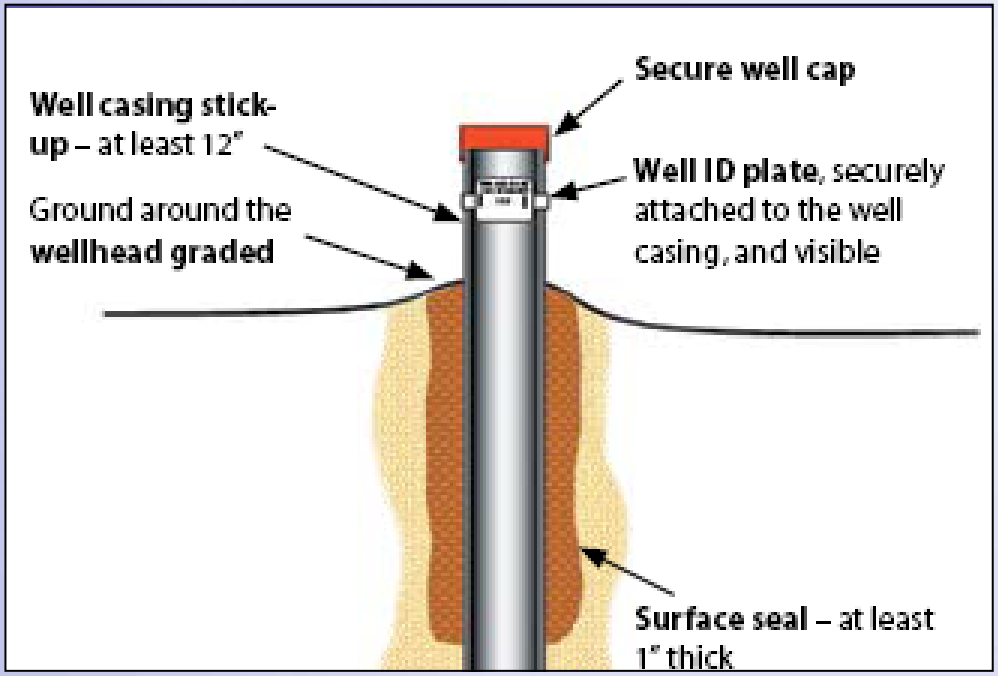
- Likely required by the SDM for new, licensable wells
- May be required in some cases for existing wells (e.g. connection with sensitive streams, aquifer mining)
- Desktop or Desktop + field tests

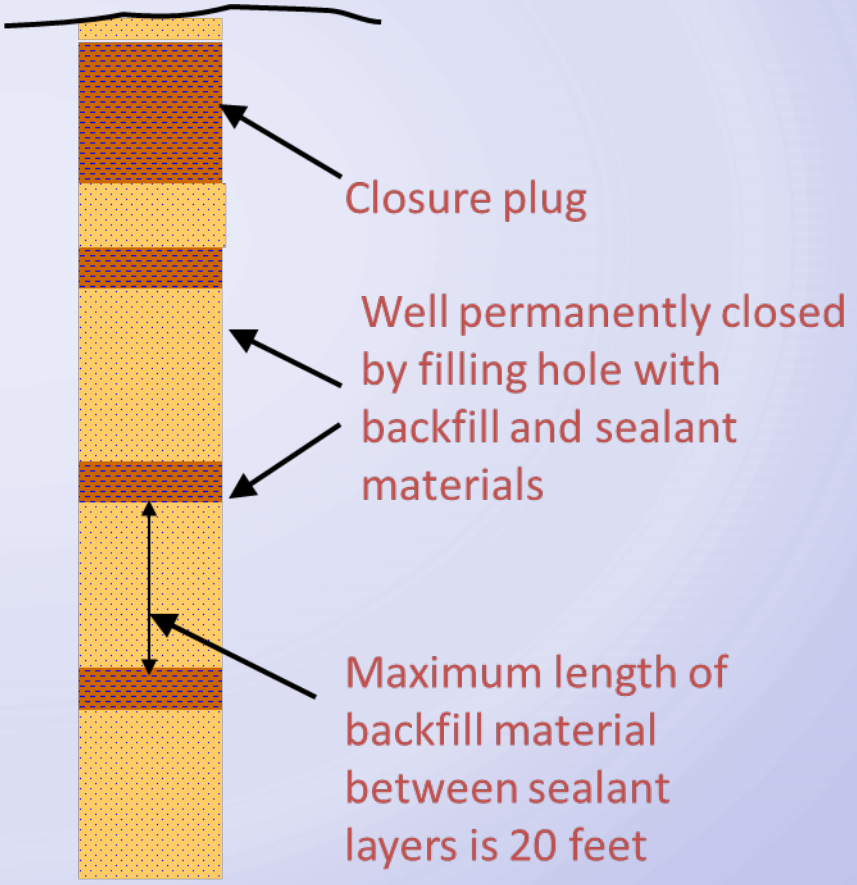
Proposed quantity of water use[1]	**Type of aquifer**	**Existence of other users[2] within a 1 Km distance of the proposed *point of diversion***
≤ 10 m^3/day (0 Points)	Unconsolidated sand and gravel (0 Points)	None (0 Points)
> 10 m^3/day but not exceeding 100 m^3/day (1 Point)	Bedrock (1 Point)	Present (1 Point)
>100 m^3/day (2 points)	-	-
Points:	Points:	Points:
	TOTAL POINTS:	

NOTES: 1: Average daily use
2: Domestic wells and licensed stream water or groundwater diversions

Total Points from Table 1	**Guidance on the need for a technical assessment**
0 Points	A technical assessment is not necessary, unless required by the SDM.
1-2 Points	Desktop technical assessment is sufficient, unless specific field-based testing is required by the SDM
> 2 Points	Desktop technical assessment and field-based testing is necessary as part of the technical assessment.

Groundwater Protection Regulation

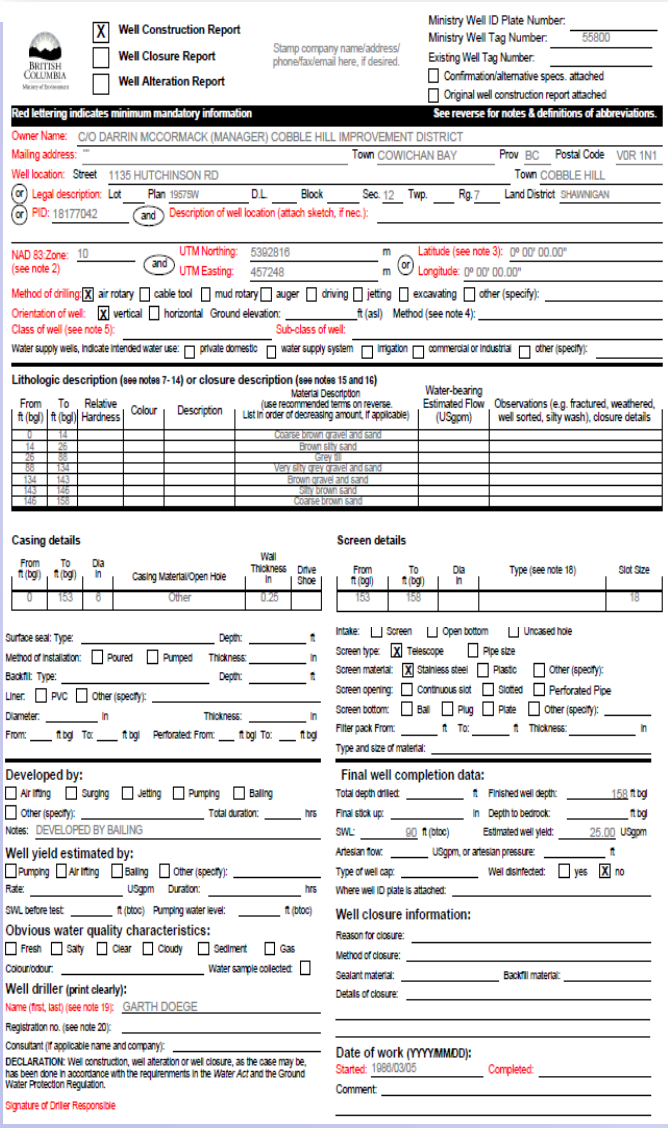




Some New Requirements

- Classes for well drillers and pump installers
- Well reports
- Well siting
- Well pits
- Alternative Specs
- Well maintenance
- Pump/pipe standards
- Testing and disinfection

	Water well driller	Geotech / env driller	GX driller	Well pump installer
Water supply well	✓			
Monitoring well	✓	✓		
Recharge/injection well	✓			
Dewatering well	✓			
Remediation well	✓	✓		
Geotechnical well	✓	✓		
Closed-loop geoexchange well			✓	
Well pump in water supply, injection or dewatering well	✓			✓



[X] Well Construction Report
[ ] Well Closure Report
[ ] Well Alteration Report

Stamp company name/address/ phone/fax/email here, if desired.

Ministry Well ID Plate Number:
Ministry Well Tag Number: 55800
Existing Well Tag Number:
[ ] Confirmation/alternative specs. attached
[ ] Original well construction report attached

Red lettering indicates minimum mandatory information — See reverse for notes & definitions of abbreviations.

Owner Name: C/O DARRIN MCCORMACK (MANAGER) COBBLE HILL IMPROVEMENT DISTRICT
Mailing address: — Town COWICHAN BAY Prov BC Postal Code V0R 1N1
Well location: Street 1135 HUTCHINSON RD Town COBBLE HILL
(or) Legal description: Lot — Plan 19575W D.L. — Block — Sec. 12 Twp. — Rg. 7 Land District SHAWNIGAN
(or) PID: 18177042 (and) Description of well location (attach sketch, if nec.):

NAD 83:Zone: 10 (see note 2) (and) UTM Northing: 5392816 m UTM Easting: 457248 m (or) Latitude (see note 3): 0° 00' 00.00" Longitude: 0° 00' 00.00"

Method of drilling: [X] air rotary [ ] cable tool [ ] mud rotary [ ] auger [ ] driving [ ] jetting [ ] excavating [ ] other (specify):
Orientation of well: [X] vertical [ ] horizontal Ground elevation: ft (asl) Method (see note 4):
Class of well (see note 5): Sub-class of well:
Water supply wells, indicate intended water use: [ ] private domestic [ ] water supply system [ ] irrigation [ ] commercial or industrial [ ] other (specify):

Lithologic description (see notes 7-14) or closure description (see notes 15 and 16)

From ft (bgl)	To ft (bgl)	Relative Hardness	Colour	Description	Material Description (use recommended terms on reverse. List in order of decreasing amount, if applicable)	Water-bearing Estimated Flow (USgpm)	Observations (e.g. fractured, weathered, well sorted, silty wash), closure details
0	14				Coarse brown gravel and sand		
14	25				Brown silty sand		
25	68				Grey till		
68	134				Very silty grey gravel and sand		
134	143				Brown gravel and sand		
143	146				Silty brown sand		
146	158				Coarse brown sand		

Casing details

From ft (bgl)	To ft (bgl)	Dia in	Casing Material/Open Hole	Wall Thickness in	Drive Shoe
0	153	6	Other	0.25	

Screen details

From ft (bgl)	To ft (bgl)	Dia in	Type (see note 18)	Slot Size
153	158			18

Surface seal: Type: Depth: ft
Method of installation: [ ] Poured [ ] Pumped Thickness: in
Backfill: Type: Depth: ft
Liner: [ ] PVC [ ] Other (specify):
Diameter: in Thickness: in
From: ft bgl To: ft bgl Perforated: From: ft bgl To: ft bgl

Intake: [ ] Screen [ ] Open bottom [ ] Uncased hole
Screen type: [X] Telescope [ ] Pipe size
Screen material: [X] Stainless steel [ ] Plastic [ ] Other (specify):
Screen opening: [ ] Continuous slot [ ] Slotted [ ] Perforated Pipe
Screen bottom: [ ] Ball [ ] Plug [ ] Plate [ ] Other (specify):
Filter pack From: ft To: ft Thickness: in
Type and size of material:

Developed by:
[ ] Air lifting [ ] Surging [ ] Jetting [ ] Pumping [ ] Bailing
[ ] Other (specify): Total duration: hrs
Notes: DEVELOPED BY BAILING

Well yield estimated by:
[ ] Pumping [ ] Air lifting [ ] Bailing [ ] Other (specify):
Rate: USgpm Duration: hrs
SWL before test: ft (btoc) Pumping water level: ft (btoc)

Obvious water quality characteristics:
[ ] Fresh [ ] Salty [ ] Clear [ ] Cloudy [ ] Sediment [ ] Gas
Colour/odour: Water sample collected: [ ]

Well driller (print clearly):
Name (first, last) (see note 19): GARTH DOEGE
Registration no. (see note 20):
Consultant (if applicable name and company):
DECLARATION: Well construction, well alteration or well closure, as the case may be, has been done in accordance with the requirements in the *Water Act* and the Ground Water Protection Regulation.
Signature of Driller Responsible

Final well completion data:
Total depth drilled: ft Finished well depth: 158 ft bgl
Final stick up: in Depth to bedrock: ft bgl
SWL: 90 ft (btoc) Estimated well yield: 25.00 USgpm
Artesian flow: USgpm, or artesian pressure: ft
Type of well cap: Well disinfected: [ ] yes [X] no
Where well ID plate is attached:

Well closure information:
Reason for closure:
Method of closure:
Sealant material: Backfill material:
Details of closure:

Date of work (YYYY/MM/DD):
Started: 1986/03/05 Completed:
Comment:

Well Reports

- Mandatory submission as of Feb 29, 2016
- eWELLS preferred (alternative: Ministry form)
- Submit to well owner
- Submit to comptroller: water supply, permanent dewatering, 1/geoexchange system, & all artesian flow

Important for:

- Pre-drilling assessments
- Delineation & classification of aquifers
- Water Licensing
- Domestic user rights
- Water budgets

Well Siting Requirement

- A new water supply or permanent dewatering well must be >15m away from an existing water supply well
- Purpose: minimize risk of excessive well interference (particularly domestic wells).
- The owner of an existing water supply well can drill one additional well within 15 metres of the existing well.
- If not feasible to meet siting requirements, a professional can recommend an alternative setback distance that is acceptable to the engineer

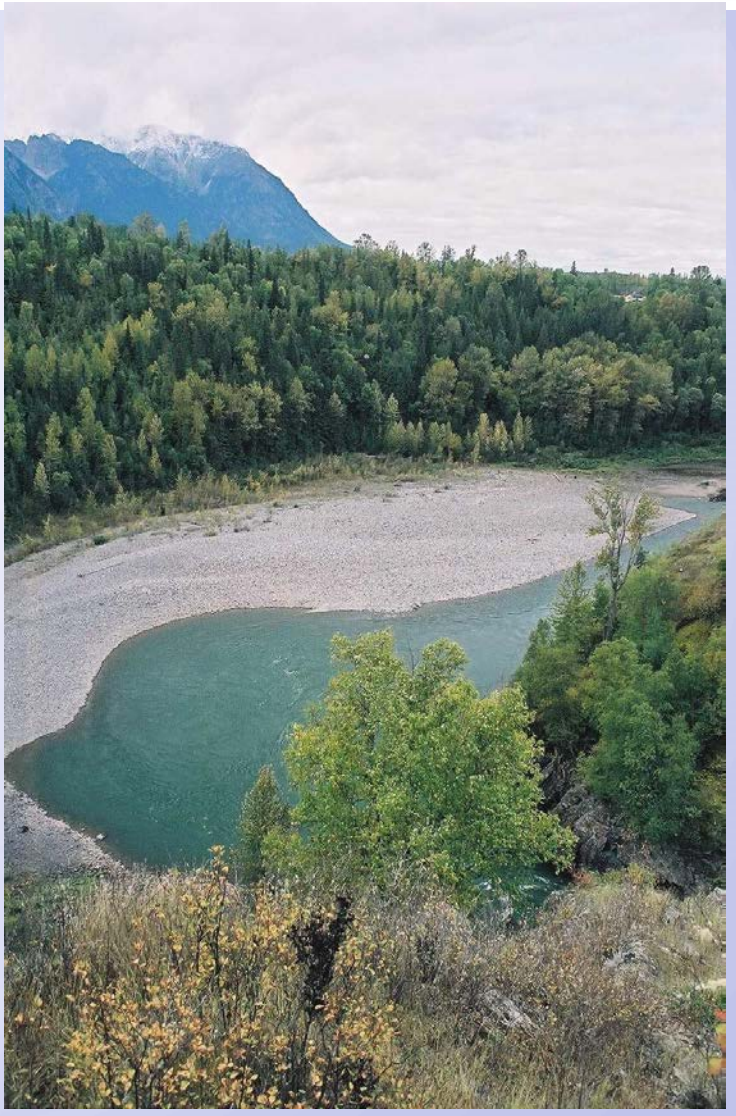
Must not construct well pit for new/altered water supply wells

Except when designed/constructed:

- By a professional;
- So water that enters the well pit does not pond in the well pit and is conveyed away;
- Under supervision of the professional who designed it;
- Design and as-built drawings must be submitted to the comptroller.

Alternative Specifications

- Alternative specifications for siting and decommissioning only
- Must be prepared by a P.Eng. or P.Geo.
- Must be submitted to, and accepted by engineer (government)
- Engineer may apply terms and conditions
- Well owner must operate the well in accordance with the conditions



Well Maintenance Requirements

- Prohibiting storage of foreign matter within 3m of the wellhead of a water supply well, or allow any foreign matter to travel within 3m of the well.
- Maintain and protect equipment installed to control artesian flow.
- Protecting the sounding tube in a well.
- Maintaining clear, safe access to the well.

Pump & pipe standards

- Pump installation must not cause movement of the casing.
- Requirements for installing pitless adaptors (e.g., water tight seal, prevent corrosion of different metals), and backflow prevention (permanent well pumps).
- Requirement to repair surface seal.
- Hand pumps must meet all requirements of a well cap (existing water supply wells have 2 years to upgrade)
- Thermoplastic casings, liners, sounding tubes in water supply wells must be certified for use for drinking water

Developing, yield testing & disinfecting wells

- developing a water supply well must not cause significant collapse of the ground near the well nor damage to the surface seal.
- must install a screen in unconsolidated sediments; however, open bottom completions are acceptable if the bottom can be developed to be stable.
- well driller must perform a well yield test on a water supply well or permanent dewatering well after drilling or alteration.

What is not covered by the GWPR

- Setback of a well from contamination sources (Health Hazards Regulation)
- Setback of a well from a creek, river, lake, etc.
- Contamination issues (still all under EMA – MoE)

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http://www.env.gov.bc.ca/wsd/data_searches/obswell/map/

Abbotsford & Chilliwack Aquifer Mapping Study

- Refine/update original interpretation done in 1993
- Develop three-dimensional conceptual hydrogeological understanding
- Updated aquifer boundaries (vertical / lateral)
- Correlate well records in WELLS Database (15 - 20 % goal) to mapped aquifers (Future work: correlate the rest of the records in WELLS)
- Provide basis for future groundwater flow model development

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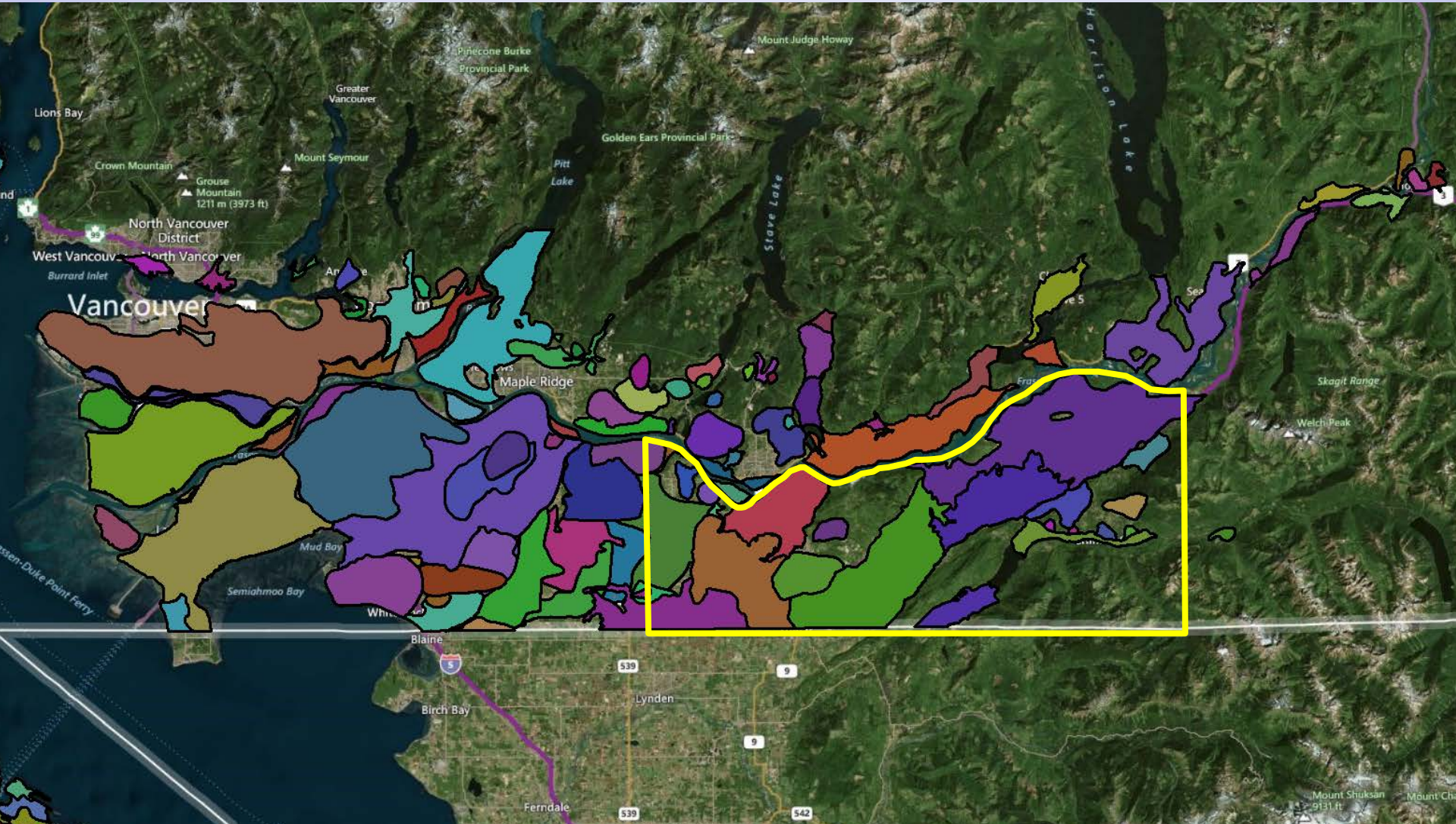

QUESTIONS?

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