

SUBDIVISION Guideline



Prepared by Vancouver Coastal Health



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This guideline was developed out of the need for improved standards for subdivisions in rural areas that rely on septic tank and absorption field systems. Sited and designed properly these sub-surface systems can be an effective method of treating domestic waste. Improperly located systems can cause public and environmental health problems. With increased demand for development in the rural areas more marginal sites are considered for subdivision.

In 1994, the health units of Coast Garibaldi and the three health units on Vancouver Island, (which are presently Vancouver Coastal Health Authority and Vancouver Island Health Authority), commissioned a study entitled "Recommendations for Subdivision Standards for Onsite Sewage Disposal", which was completed by U.B.C. Department of Soil Sciences, Resource Management, and Environmental Studies. This report outlined many recommendations designed to improve the subdivision evaluation process and limit cumulative risks. The recommendations in the UBC report were instrumental in creating this guideline.

The purpose of this guideline is to:

- ❖ Provide a sustainable solution for residential onsite wastewater and to ensure that the creation of new lots will support a primary and reserve sewerage system to service one three-bedroom residence.
- ❖ Eliminate the need for costly extension of sewer connections until a comprehensive liquid waste management plan and servicing funding is in place.
- ❖ Address concerns of detrimental cumulative impact associated with increased density using onsite systems.
- ❖ Protect drinking water sources.

This guideline will not guarantee that this assessment process will secure future development on a parcel with sewage flows in excess of that generated by a single three-bedroom dwelling (300 imperial gallons/day). When zoning allows second dwellings or sewage flows beyond the 300 igpd are anticipated, the applicant may provide further assessment data in order to demonstrate additional absorption field sites and restrictive covenant areas. Otherwise, the covenant area will be restricted to serve as a primary and reserve site for a single three bedroom dwelling.

This guideline is considered to be a minimum standard for Vancouver Coastal Health Authority. Local government, Islands Trust, or other agencies may have additional requirements. Health Authority staff may consider specifications greater than the minimums to reduce anticipated health risks.

Vancouver Coastal Health is a referral agency only and final decision on preliminary layout approval (PLA) and final approval rests with the Approving Officer. For more information on subdividing in Vancouver Coastal Health Authority, refer to Section C; Overview of Subdivision Process (page 4).

This guideline is a public document for reference and information in the subdivision process and will undergo periodic review and update. A copy of the most recent Subdivision Guideline can be found at www.vch.ca.

“Approving Officer” Means an approving officer designated as such pursuant to the *Land Title Act*.

“Authorized Person” Is a registered practitioner or professional as defined in the Sewerage System Regulation (BC Reg 326/2004).

“Breakout Point” A location downslope of an absorption field area or a restrictive covenant area, where effluent may surface onto the land or into a roadside ditch, embankment, curtain drain, interceptor drain, or relief drain.

“Cumulative Effect” The combined environmental impact that can occur over time from a series of similar or related actions, contaminates, or projects. Although each action may seem to have a negligible impact, the combined effect can be detrimental.

“Drinking Water Officer” (DWO) A Medical Health Officer, Public Health Inspector or Environmental Health Officer appointed under the authority of the *Drinking Water Protection Act*.

“Ground Water Table Assessment” All subdivision proposals must address the seasonal or permanent ground water table. Assessments must also provide data concerning the impact of the proposed development on the quality of the ground water. A hydrogeological assessment may be required when the drainage of surface water, permeability of the soil, density of the development or any other condition indicates further study is necessary.

“Environmental Health Officer” (EHO) Environmental Health Officer or Public Health Inspector certified to work in Canada and delegated authority by the Medical Health Officer.

“Health Official” An Environmental Health Officer, Drinking Water Officer, or Medical Health Officer

“High Water Mark” A point on the shoreline, which corresponds:

- a) For a controlled lake, to the highest water level within the normal operating range.
- b) For any other body of tidal or non-tidal water, to the average highest water level calculated from measurements taken over a sufficient number of years to enable a reasonable estimate.

“Minimum Native Mineral Soil Depth” That portion of the native soil profile which *Does Not* include: forest litter, humus, prolonged saturated zones, highest seasonal water table, pans, crusts, alternating material stratification, cemented layers, bedrock, large cobbles, boulders, shale, fill material, reworked soil, and disturbed native soil.

“Overall Lot Slope” The natural slope of a proposed lot measured from the highest to lowest elevation and recorded in percentage. A B.C. Land Surveyor or Professional Engineer may have to verify this slope or provide topographical maps.

“Registered Practitioner” Is a person who is qualified to act as a registered practitioner under section 7 (1) or (2) of the Sewerage System Regulation (BC Reg. 326/2004).

“Public Health Engineer” An Issuing Official delegated authority under the Drinking Water Protection Act to issue Construction Permits for construction, alteration or extension of a water supply system.

“Restrictive Covenant Area” The area set aside on the lot to protect a primary and reserve absorption field, and downslope setback area (if necessary). The restrictive covenant is registered against the land title (Section 219, Land Title Act) to protect and restrict the site from uses other than the onsite system. All primary and reserve absorption field areas are to be delimited by reference plans and such plans are to be attached and form part of the restrictive covenant documents. Refer to Appendix 5 (page 25) for a sample restrictive covenant.

“Seasonal High Water Table” The high water table that persists in the soil for more than two weeks. The preferred procedure for determining the SHWT is through weekly or bi-weekly measurements in perforated or slotted standpipes (piezometer). Where this is not practical, the depth may be estimated from soil mottling and root depth.

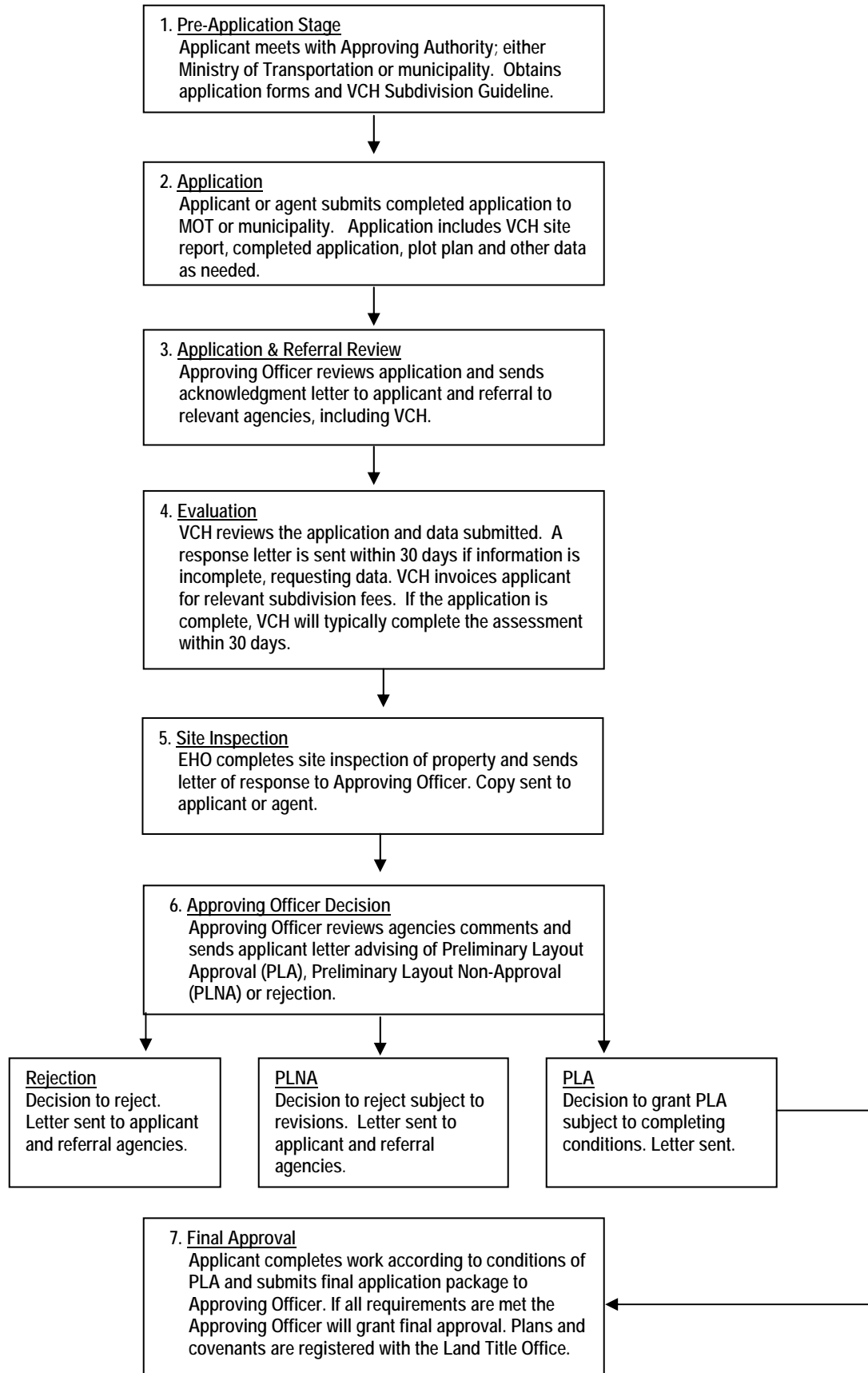
“Sewerage System” Is a system for treating domestic sewage that uses one or more treatment methods and a discharge area, but does not include a holding tank or pit privy.

“Treatment Method” Means a treatment method for a sewerage system classified as a Type 1, Type 2 or Type 3, where:

- a) Type 1 is treatment by septic tank.
- b) Type 2 is treatment that produces an effluent containing less than 45 mg/l of total suspended solids and a 5 day biochemical oxygen demand of less than 45 mg/l.
- c) Type 3 is treatment that produces an effluent quality containing less than 10 mg/l of total suspended solids and a 5 day biochemical oxygen demand of 10 mg/l and a median fecal coliform density of less than 400 colony forming units per 100 ml.

“Water Supply System” A system of water supply, approved pursuant to the Drinking Water Protection Act and Regulation. A water system includes its source, treatment, storage, transmission and distribution facilities, but does not include a water supply servicing only one single family residence. The system must be owned, operated and maintained by a regional district, a strata corporation or an improvement district under the Water Act or the Local Government Act.

“Wet Season Assessment” An assessment of the seasonal high water table during the wet season. The coastal wet season is generally from November 1st to March 31st. Some geographical areas may require special consideration. In areas such as the Pemberton Valley and Bella Coola Valley, the assessment would be from May to July or October to November respectively. Varying annual rainfall may allow assessment in different months and is at the discretion of the local Environmental Health Officer.



1. Treatment Method

All subdivision reviews are based on Type 1 treatment (septic tank system). Type 2 and 3 systems will be considered for community sewerage systems, please refer to Section L (page 18), or if all of the following conditions apply:

- a. The local government has enacted a bylaw for Operation and Maintenance of Type 2 and 3 systems.
- b. The local government has enacted a Holding Tank Bylaw.
- c. An approved Liquid Waste Management Plan is in place for the specific area and there is confirmation in writing from the local government confirming sanitary sewer service to the property within 10 years or a time period considered reasonable by VCH.
- d. Zoning is in place that limits the development on each parcel to one, single family dwelling.

2. Restrictive Covenants

All proposed parcels including parcels with existing dwellings, will require a restrictive covenant to protect the primary and reserve absorption field sites. The size must satisfy requirements of Table A or B. In the case of parcels with existing dwellings, a reserve covenant area is required. (Refer to Sec.D.7). The following applies to restrictive covenants:

- a. Minimum dimension across the slope of the restrictive covenant is 80 feet (25 M).
- b. Covenants must be registered with a Reference Plan.

3. Breakout Point

Where an area has been identified with a downslope breakout point, the proposed primary and reserve areas should be located at least 50 feet (15 m) from the breakout point. The additional 50 foot downslope area should be included in the proposed covenant to ensure this area remains as a protective treatment absorption area.

4. Setback Distances

The following are minimum setback distances for all subdivisions:

- a. 100 feet (30 m) from individual well to absorption field site.
- b. 10 feet (3 m) from the absorption field to any building or property line.
- c. 3 feet (1 m) from the septic tank to any building or property line.
- d. 100 feet (30 m) from high water mark of marine water or fresh water to absorption field site.
- e. 50 feet (15 m) from water suction lines to absorption field site.

5. Permeability of Soil

The maximum percolation rate in the proposed restrictive covenant area must not exceed 30 minutes per inch or be less than 1 minute per inch. The hydraulic conductivity rate must not be less than 4.5 cm/day or exceed 300 cm/day.

6. Wet Season Assessment

Wet season assessments may be required at the discretion of the local EHO to confirm the seasonal high water table.

7. Parcels With Existing Dwellings

For proposed subdivisions with an existing dwelling and sewerage system the following is required:

- a. A copy of the existing sewerage system permit or filing.
- b. A reserve absorption field site for each dwelling, meeting all conditions in Table A or B.
- c. The EHO may require an assessment of the existing sewerage system by an Authorized Person.
- d. The assessment by the EHO will determine any potential risks associated with the water and sewerage systems servicing existing dwellings and the EHO may provide recommendations to the Approving Officer for consideration in the PLA or PLNA.

8. Consideration of Smaller Parcels

Sensitive areas such as waterfront properties, properties with geotechnical concerns, high density in areas of sensitive domestic water sources or unconfined aquifers, areas with poor drainage, or properties within watersheds, may not be suitable for reductions in parcel size.

A smaller parcel may be considered by an EHO if all requirements in Table A or B are demonstrated and one of the following applies:

- a. One proposed parcel is physically severed by an existing gazetted road allowance.
- b. The Agricultural Land Commission restricts the area of one parcel.
- c. The local government has:
 - i. Operation and maintenance bylaws in place for onsite sewerage systems, and
 - ii. A holding tank bylaw, and
 - iii. An approved liquid waste management plan is in place that includes the property, and
 - iv. Confirmation is in writing from the local government that assures sanitary sewer connection to proposed lots within 10 years or a time period determined to be acceptable to the Health Authority.

9. Section 946, Local Government Act for lots with individual wells

Under Section 946 of the Local Government Act an EHO may consider the following restrictions for parcels not serviced by an approved water supply system:

- a. The minimum parcel size to be subdivided must be at least 2 hectares.
- b. The average size of the two proposed parcels must be at least 1 hectare, with the smallest parcel not less than .75 hectare.
- c. The parcel less than 1 hectare must have optimum site conditions with a minimum of 36 inches (91 cm) of native mineral soil depth and overall lot slope less than 30%.
- d. The parcel less than 1 hectare will be limited to one, single family dwelling by registration of a restrictive covenant.
- e. The parcel greater than 1 hectare may be limited to one, single family dwelling by registration of a restrictive covenant, based on the assessment of the EHO.
- f. Parcels may be limited from future subdivision by registration of a restrictive covenant.
- g. An EHO may consider a hydrogeological assessment, Section I (page 15). As part of the hydrogeological assessment, the EHO may request that the professional determine the risk associated with the cumulative impact of the parcel size in relation to neighbouring parcel density.

1. Minimum Lot Size

The minimum lot size for proposed parcels on approved water supply system $\frac{1}{2}$ acre (2000 m²).

2. Table A

Slope Within Covenant Area (%)	Native Mineral Soil Depth (Inches)	Professional Assessment & Reduced Soil Depth (Inches) See (3) below	Minimum Lot Size	Minimum Covenant Area Based On Soil Permeability. (Combined primary and reserve covenant area).		
				Sands-Gravels 1-5 Min/Inch	Loams 6-15 Min/Inch	Silts 16-30 Min/Inch
Up to 15%	48"	36"	$\frac{1}{2}$ acre (2000 m ²)	5760 ft ² (535 m ²)	7700 ft ² (715 m ²)	9580 ft ² (890 m ²) May not be applicable for $\frac{1}{2}$ acre parcels
	36"	30"	$\frac{3}{4}$ acre (3000 m ²)			
	30"	24"	1 acre (4000 m ²)			
	24"	18"	2.5 acres (8000 m ²)			
	18"	18"	5 acres (2 ha.)			
16 to 30%	48"	48"	$\frac{1}{2}$ acre (2000 m ²)			
	36"	36"	1.00 acre (4000 m ²)			

3. Professional Assessment & Reduced Soil Depth

A reduction in the minimum native soil depth in Table A will be considered if a professional engineer or geoscientist submits a report addressing the limitations of the site. The following conditions apply and must be detailed in the engineering report.

- The number of dwellings on the parcel is restricted to one, either by zoning or covenant.
- Lot size is consistent with Table A; e.g. 30" of native soil = $\frac{3}{4}$ acre lot.
- Uniform and continuous soil coverage throughout the entire parcel.
- Overall lot slope is less than 15%.
- Slope within the covenant area is less than 15%.
- There are no breakout points, seepage areas or other limiting factors 50 feet down gradient of the covenant area.
- Design recommendations of the lot or sewerage system that address limitation of the site. (eg: interceptor ditches)

1. Minimum Lot Size

The minimum parcel size considered for properties that are serviced by a private well is 2.5 acres (1 ha).

2. Table B

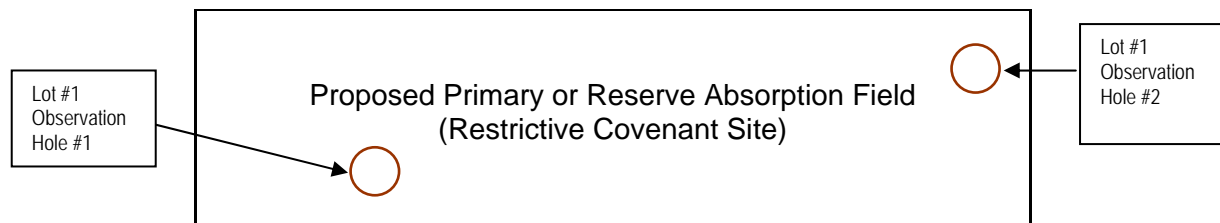
Slope Within Covenant Area (%)	Minimum Native Mineral Soil Depth (Inches)	Minimum Lot Size	Minimum Covenant Area Based On Percolation Rate (combined primary and reserve covenant area)		
			Sands-Gravels 1-5 Min/Inch	Loams 6-15 Min/Inch	Silts 16-30 Min/Inch
Up to 15%	36"	2.5 acres (1 ha.)	5760 ft ² (535 m ²)	7000 ft ² (715 m ²)	9580 ft ² (890 m ²)
	24"	3.75 acres (1.5 ha.)			
	18"	5 acres (2 ha.)			
16 to 30%	48"	2.5 acre (1 ha.)	5760 ft ² (535 m ²)	7000 ft ² (715 m ²)	9580 ft ² (890 m ²)
	36"	5 acres (2 ha.)			

1. Background

In order to complete the application and submit the necessary data to VCH, the applicant is required to undertake a site investigation and complete soil suitability tests (observation holes and soil permeability), record slope, and complete a detailed drawing of the property.

Subsurface soil conditions are demonstrated by observation holes and soil permeability tests. The observation holes define the soil texture, soil characteristics, and establish the presence of bedrock, limiting layers, and water table. Soil permeability tests determine the suitability of the soil to absorb sewage effluent.

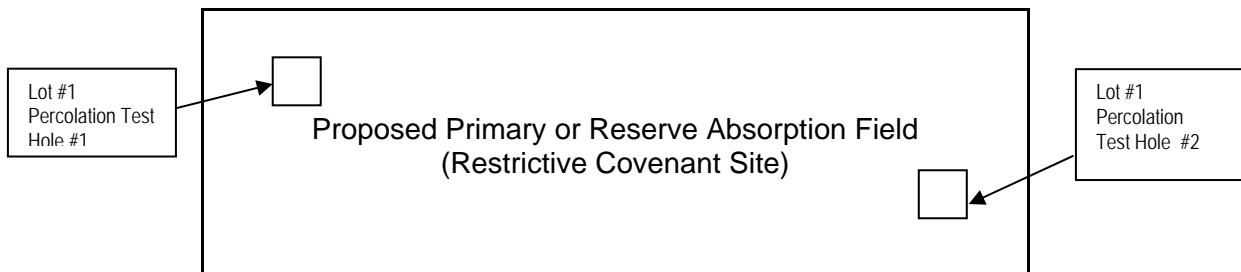
2. Observation Holes



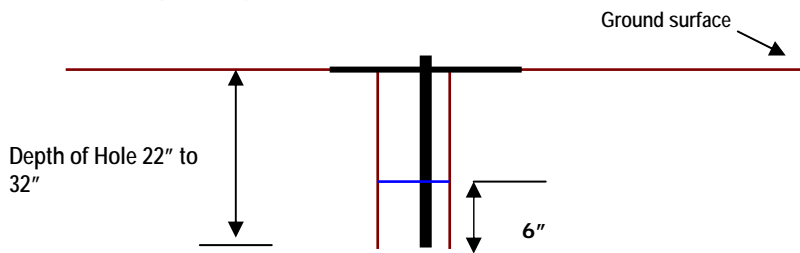
- a. To demonstrate soil conditions and depth within each primary and reserve absorption field site, dig or bore at least two holes to a minimum of 48 inches (1.2 m). Locate the observation holes at each end of the site to represent soil conditions. Further holes may be required depending on the nature of the soil and the size of the proposed absorption field or at the discretion of the EHO.
- b. If there is a potential breakout point below the proposed primary/reserve absorption field site (such as bedrock, exposed bank with hardpan layer, etc) then dig or bore at least 2 additional holes to represent the soil conditions 50 feet (15 m) downslope of the site. Refer to Sample Plot Plan, page 14.
- c. The holes must be a minimum diameter of 2 feet so the EHO can clearly see the sides and bottom of the holes.
- d. Describe the conditions* in the observation holes on the Site Report (Appendix 2, page 21). Leave the excavated material beside the test holes for the EHO inspection. Cover the holes to prevent injury.
 - *Describing conditions:
 - soils; e.g. loam, gravel, sand, clay, silt, colour and depth
 - depth of root system
 - depth of water table or limiting layer such as hardpan or rock
- e. Clearly flag each observation hole using fluorescent surveyors tape with numbers that correspond to the lot and to the Site Report (Appendix 2, page 21).
- f. An EHO may request additional observation holes or testing.
- g. For sites with variable soils or inconsistent depths of soil, additional observation holes and permeability testing is necessary.

3. Soil Permeability

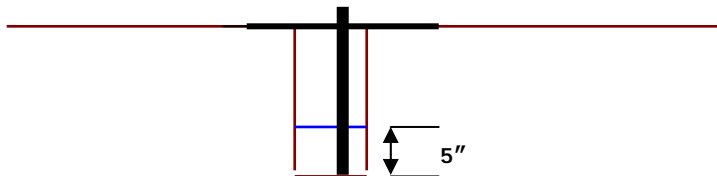
Method #1; Percolation Test



- Dig a minimum of 2 percolation test holes 12" (30 cm) square to a depth of 22"-32" (56-81 cm) in the proposed primary and reserve absorption field site.
- The location of the percolation holes must be representative of the site and spaced to define the area.
- Remove any smeared soil from the walls and bottom of the holes.
- If the soil contains considerable amounts of silt or clay the holes must be pre-soaked before proceeding with the test. Pre-soaking is accomplished by keeping the hole filled with water for a minimum of 4 hours. If the holes do not have clay or silt, proceed to the next step.
- To complete the test; fill the test hole with water. When the water level is 5" (13 cm) or less from the bottom of the hole, refill the hole to the top. No recording of time is necessary at this stage.
- When the water level drops below 5" (13 cm) after the second filling, add water to bring the level to 6" (15 cm) or more.



- Observe the water level until it drops to the 6" (15 cm) depth and begin recording at precisely 6" until the water drops to 5" (12.5 cm). Stop timing and record the time in minutes.

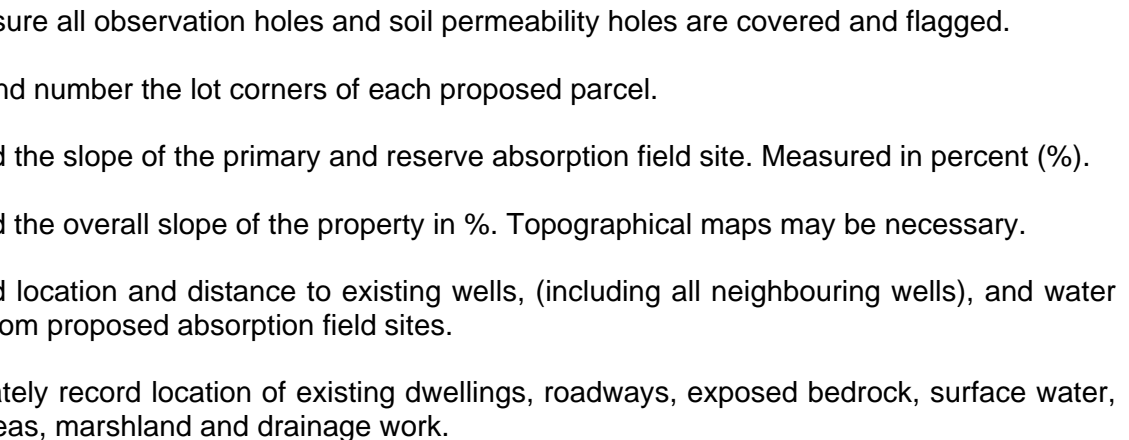


- Repeat procedures f) and g) until the last 2 tests do not vary more than 2 minutes per inch (per 2.5 cm).
- Determine the percolation rate for the proposed absorption field by averaging the slowest rate for each of the test holes.
- Cover the percolation test holes to prevent injury and flag the location for the EHO inspection. Number the holes such that the numbers correspond to the Subdivision Plot Plan and the Site Report.
- Complete the Site Report with the relevant permeability or percolation test data. Appendix 2, page 21.
- For sites with variable soils or inconsistent depths of soil additional observation holes and permeability testing is necessary

3. Soil Permeability...continued**Method #2; Soil Hydraulic Conductivity**

- a. An Authorized Person as defined in the Sewerage System Regulation must complete this method for field tests of hydraulic conductivity or soil permeability. Several test methods can be used, including the constant head permeameter, double ring infiltrometer and the trench pump-in test.
- b. The hydraulic conductivity test must be conducted in the proposed primary/reserve absorption field site, in unsaturated native soil and at the depth of a typical infiltrative surface.
- c. Complete the test procedure in the proposed primary/reserve absorption field site and record the value referred to as the field-saturated soil hydraulic conductivity (Kfs).
- d. At least 4 field tests should be completed calculating the design Kfs using the 2nd lowest value.
- e. Flag the Hydraulic Conductivity test holes and number the holes to correspond with the Subdivision Plot Plan and the Site Report.
- f. The Authorized Person must complete the Site Report indicating the hydraulic conductivity data. The AP must seal the report with the pertinent stamp.

4. Completing the Site investigation

- 
- a. Make sure all observation holes and soil permeability holes are covered and flagged.
 - b. Flag and number the lot corners of each proposed parcel.
 - c. Record the slope of the primary and reserve absorption field site. Measured in percent (%).
 - d. Record the overall slope of the property in %. Topographical maps may be necessary.
 - e. Record location and distance to existing wells, (including all neighbouring wells), and water lines from proposed absorption field sites.
 - f. Accurately record location of existing dwellings, roadways, exposed bedrock, surface water, wet areas, marshland and drainage work.

1. Compiling the Data

Once the site investigation is complete the data collected from the assessment will be used to complete the Application (Appendix 1, page 20); Site Report (Appendix 2, page 21) and Plot Plan (Sample Plan, page 14).

2. The Subdivision Plot Plan

The proposed subdivision plan must be completed to scale and include:

- a. The location of all observation holes and percolation or soil hydraulic conductivity test holes with numbering or coding corresponding accurately to the onsite flagging.
- b. All proposed lot boundaries and lot areas drawn to scale. Indicate the scale on the plan.
- c. The slope within the restrictive covenant areas (measured in %).
- d. Scale plan showing dimension of restrictive covenant areas.
- e. Location and area of all surface water, wet areas, marshland, existing and proposed ditches and drainage work.
- f. Location of all existing and proposed well sites, including wells on neighbouring properties.
- g. Location of all existing water lines and identifying any water supply suction lines
- h. Location of all existing buildings and roadways.
- i. Location of easements or covenants and note their purpose.
- j. Location of all exposed bedrock within 15 metres of a proposed covenant area.
- k. North arrow.

3. Topographical Maps and Slope Confirmation

Topographical mapping and/or confirmation from a B.C. Land Surveyor or Professional Engineer of overall lot slope and/or slope within covenant areas should be provided if:

- a. Overall slope exceeds 15%.
- b. The property is covered with dense vegetation.
- c. Requested by the Environmental Health Officer.

4. Application Submission

Forward the completed information to the Approving Officer (Ministry of Transportation or local government); include the Plot Plan, Application (Appendix 1), Site Report (Appendix 2), topographical maps, slope confirmation and all other relevant data.

A referral from the Approving Officer will then be sent to Vancouver Coastal Health for review. If application information or onsite works are lacking, a written request for the additional information or testing will be sent to the applicant by the EHO.

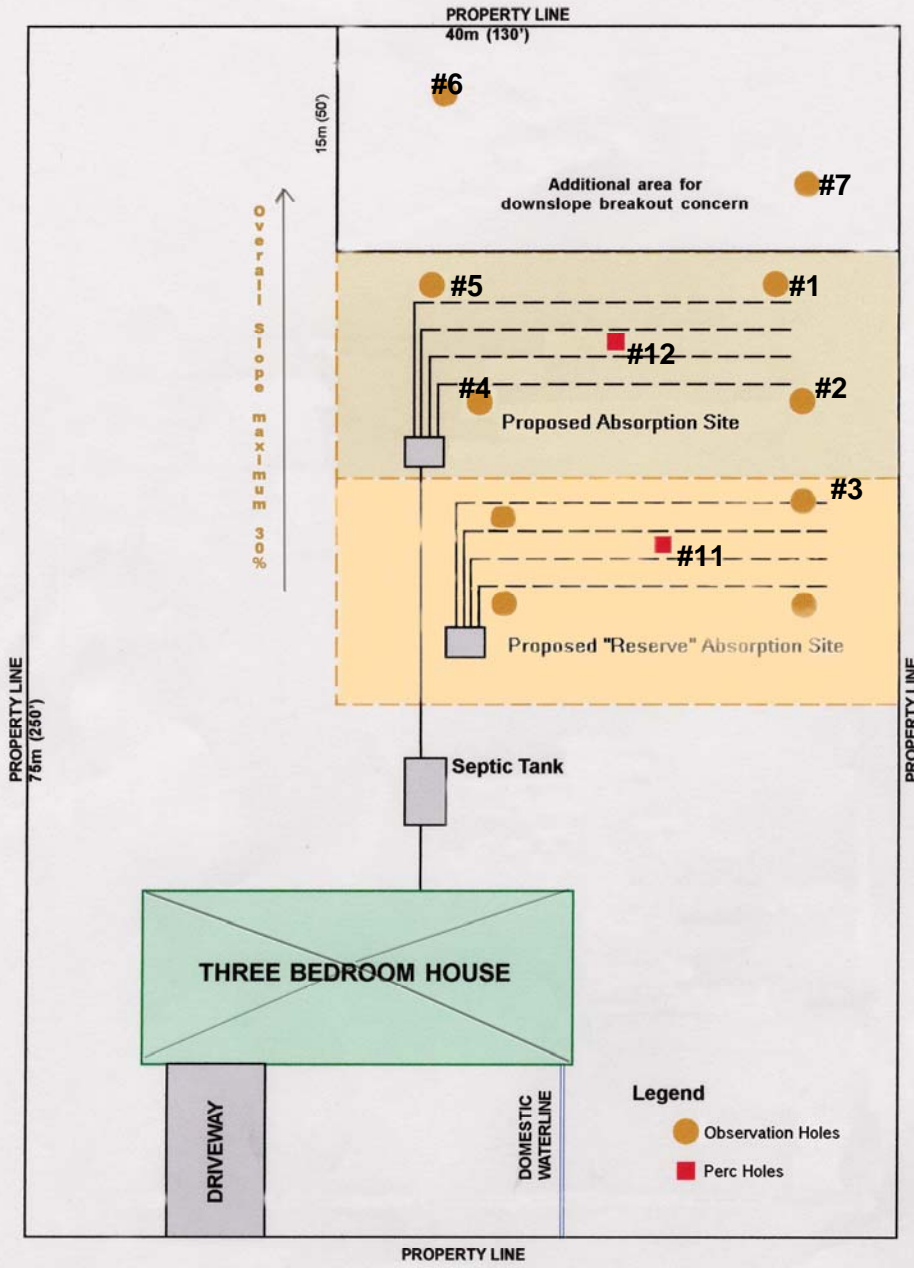
5. Subdivision Fees

- ❖ VCH charges a fee of \$200 for each lot to be assessed.
- ❖ Other fees apply if the subdivision is to be serviced by a community sewerage system and/or a new water supply system.
- ❖ Once VCHA receives the referral from the Ministry of Transportation, an invoice will be mailed to the applicant.

6. Vancouver Coastal Health Offices

- | | | |
|-------------------|---|----------------|
| ❖ Powell River | 3 rd floor – 5000 Joyce Avenue | (604) 485-3310 |
| ❖ Sechelt | 5571 Inlet Ave. | (604) 885-5164 |
| ❖ Squamish | 1140 Hunter Place | (604) 892-2293 |
| ❖ Whistler | 202-4380 Lorimer Rd. | (604) 932-3202 |
| ❖ North Vancouver | 5 th Floor, 132 West Esplanade | (604) 983-6793 |

LABEL TEST HOLES



Sample Plot Plan

A hydrogeological assessment can be defined as an evaluation of human exposure and risk assessment relating to contaminated soil and ground water flow. A hydrogeological assessment is required under the following conditions or at the discretion of the EHO:

- a. Potential for ground water contamination in areas not serviced by an approved water supply. Concerns may be due to an unconfined aquifer and rapidly draining soil.
- b. Concern for cumulative effects on sloping properties, on neighbouring properties and potential for ground water or surface water contamination.
- c. Historical or existing circumstances in the area of the proposed subdivision, for example, malfunctioning sewerage systems, drainage problems, or contaminated ground water table or aquifers.
- d. Increased density, for example, developments greater than 10 parcels, phased developments exceeding a total of 10 parcels, or average parcel density of less than 2.5 acres.
- e. For all subdivisions proposing a Community Sewerage System under the jurisdiction of the Health Act, Section L (page 18).
- f. Assess potential breakout points and to address other critical site conditions.

A geoscientist or engineer (licensed in British Columbia), qualified through training and experience in hydrogeological assessments, must complete the report.

The establishment of a new water supply system or community water system must comply with the Drinking Water Protection Act, and Local Services Act respectively. Please refer to the **Guidelines for Approval of a Water Supply System** for complete instructions. Available on web site: www.vch.ca or at VCH offices.

Approval for new water systems and alterations or extensions to an existing water system to service a proposed subdivision (such as water main extensions) will require a Construction Permit as a condition of Preliminary Layout Approval. The Regional Public Health Engineer (Issuing Official) issues the Construction Permit under Section 7 of the Drinking Water Protection Act. Refer to the Guidelines for Approval of a Water Supply System for further details.

Under the Local Services Act, a water supply system must be owned, operated, and maintained by:

- a. An Improvement District regulated under the Water Act or the Local Government Act, or,
- b. A Regional District, or
- c. A Strata Corporation regulated under the Water Utility Act.

The Water Utility Act refers to servicing of 5 or more parcels. Under the Water Utility Act, a Certificate of Public Convenience and Necessity is required. Subdivision proposals that do not meet this requirement will require individual private water supplies for each parcel.

The Drinking Water Officer must approve the water quality of the proposed water supply. Parameters and requirements for water testing are referred to in the VCH Guidelines for Approval of a Water Supply System.

Before a water supply system can be put into use, a valid Operating Permit issued by the Drinking Water Officer is required (Section 8, Drinking Water Protection Act).

In areas with naturally occurring arsenic in groundwater, the Approving Officer has requested VCH to provide comments regarding water quality. Refer to Appendix 3; "Guidelines for Wells With Elevated Arsenic" (page 22) and Appendix 4; "Guidelines for Shallow Wells" (page 24).

Local governments may have subdivision or servicing bylaws that address water quality and/or quantity for individual dwellings at the time of subdivision.

Surface water sources (such as lakes, rivers, and springs), and shallow wells that are under the influence of surface water are not considered to be potable without further treatment to assure disinfection from microbial pathogens (including viruses, bacteria, and protozoa organisms).

Point of Entry (POE) treatment devices are commercially available for effective treatment. However, care is required in the selection of POEs to ensure they have been accredited by a recognized independent agency (such as NSF, UL or equivalent).

POE treatment devices require regular maintenance as prescribed by the manufacturer, and monitoring should be conducted to confirm satisfactory performance. Furthermore, it is important to regularly review the source water quality for chemical and physical parameters that may necessitate pre-treatment (for example; filtration to remove turbidity) or to provide additional treatment barriers (such as nitrate removal).

A community sewerage system (under the Health Act) is defined as a sewerage system for more than one lot, or servicing more than one single family dwelling in a strata plan, with a maximum daily sewage flow of 5000 imperial gallons per day (22,730 litres/day). The following conditions will apply if proposing a community sewerage system:

1. A community system must comply with the Sewerage System Regulation; including the following conditions:
 - a. A primary and 100% reserve absorption field area must be demonstrated that meets all conditions specified in Table C and D (page 19).
 - b. A Professional Engineer, licensed to practice in BC, must design the system and provide working drawings. The design engineer shall supervise the installation of the approved system and provide a sealed certificate of the installed works.
 - c. A hydrogeological assessment is required for all community sewerage systems. A professional geoscientist, licensed to practice in British Columbia, must complete this assessment. The following are minimum parameters the geoscientist is expected to address:
 - Ability of site to treat and dispose of effluent.
 - Protection of groundwater aquifers and drinking water sources. Refer to the Ministry of Environment standards for well separation as specified in the Municipal Sewage Regulation.
 - The groundwater mound effect and implications.
 - The cumulative impact the sewerage system will have on neighbouring properties and the receiving environment.
 - d. A restrictive covenant is required to protect the primary and reserve absorption field areas. The following conditions apply:
 - The size of the covenant is based on the absorption field length requirements in Table C and D plus a 10 foot separation from all portions of the designed system, including the toe of the slope or mound.
 - Additional covenant area may be necessary if the hydrogeological report specifies further setbacks due to the groundwater mound effect, breakout, or impact to the receiving environment.
 - The grantee of the covenant is Vancouver Coastal Health Authority.
 - The covenant area is to be delimited by a reference plan, which is to accompany the final covenant documents. See Appendix 5, page 25 for a sample covenant document.
 - e. Community systems must be owned and operated by a Regional District, Municipality, or a Strata Corporation. A local government may have additional requirements and it is recommended that local governments have servicing bylaws that address the long term operation and maintenance of these public systems.

Table "C" – Septic Tank Effluent

Septic Tank (Type 1) Treatment Servicing Community Sewerage System				
Minimum natural porous soil depths and absorption field length requirements for every 1,000 imp. Gal. (4500 L) of estimated daily sewage flow				
Slope within Absorption Field Area	Minimum Depth of Native Mineral Soil (inches)	Sands & Gravels 1-5 Min/Inch	Loams 6-15 Min/Inch	Silts 16-30 Min/Inch
0% - 10%	36 "	1300' (390m)	2000' (600m)	3000' (900m)
11 – 30 %	48"			
All absorption field areas are to be at least 50 feet (15m) from a possible breakout point. The length requirements include 100% reserve				

Table "D" – Package Treatment Plant Effluent

Package Treatment Plant or Extended Treatment (Type 2 and 3) Servicing Community Sewerage System				
Minimum natural porous soil depths and absorption field length requirements for every 1000 imp. Gal. (4550 L) of estimated daily sewage flow Treated effluent – Maximum 45/60 (BOD/TSS)				
Slope within Absorption Field areas	Minimum Depth of Native Mineral Soil (inches)	Sands and Gravels	Loams	Silts
0 – 10%	36"	500' (150m)	700' (215m)	1000' (305m)
11- 30%	48"			
All absorption field areas are to be at least 50 ft. (15m) from a possible breakout point. The length requirements include 100% reserve.				

Site Information	Lot Number _____	Lot Number _____	Lot Number _____			
Lot Size						
Lot Dimension						
Covenant Info	PRIMARY	RESERVE	PRIMARY	RESERVE	PRIMARY	RESERVE
Slope Within Covenant Area (%)						
Covenant Area (m ²)						
Covenant Dimensions						
Depth of Native Mineral Soil	PRIMARY	RESERVE	PRIMARY	RESERVE	PRIMARY	RESERVE
Observation Hole #1						
Observation Hole #2						
Permeability Test Results	PRIMARY	RESERVE	PRIMARY	RESERVE	PRIMARY	RESERVE
Test #1						
Test #2						

****Attach description of the soil profile from the observation holes to this report****

- Describing conditions:
- soils; e.g. loam, gravel, sand, clay, silt, colour and depth
 - depth of root system
 - depth of water table or limiting layer such as hardpan or rock

Date(s) of Observations/Tests: _____

Observations and testing performed by: _____

Signature: _____ **Seal:** _____

In the rural areas of Vancouver Coastal Health, deep wells or drilled wells that finish in bedrock may contain naturally occurring arsenic. The Approving Officer has requested that VCH provide guidance with subdivision proposals that rely on independent drilled wells for the potable water supply.

The following factors were taken into consideration:

- a. The demonstrated unreliability of point of use treatment for arsenic.
- b. The concern for an increase or proliferation of properties with elevated arsenic in rural areas where a regional community supply is not available in the foreseeable future.
- c. The recent reduction in the maximum acceptable concentration (MAC) for arsenic to 10 parts per billion (ppb) from 25 ppb in the Guidelines for Canadian Drinking Water Quality.
- d. The Guidelines for Canadian Drinking Water Quality include precautionary wording for arsenic that states the concentration should be “as low as reasonably achievable”, below 10 ppb.
- e. Possible laboratory error of up to + or - 25%.
- f. The quality of water from initial pump tests may not be indicative of eventual or long term water quality.
- g. Arsenic concentrations can change over time.
- h. Arsenic is a known carcinogen.

Test Results: 5 – 25 ppb

Based on these factors and uncertainties the following will apply:

- a. Proposed subdivisions with arsenic concentrations exceeding 25 ppb will not be considered acceptable for subdivision approval. The EHO will recommend to the Approving Officer that the subdivision be rejected.
- b. If testing results range between 5-25 ppb, additional sampling and assessment is required. The subdivision proponent must retain the services of a professional geoscientist licensed in BC, a professional engineer licensed in BC with expertise in ground water assessment, or a qualified well driller registered in the Province of B.C. This assessment will include comprehensive sampling and prolonged pump tests of the wells. The assessment will provide the Drinking Water Officer with sufficient data to assure him or her that the ground water quality is safe by not exceeding 25 ppb in the foreseeable future and the supply with less than 25 ppb is sustainable for the purpose intended.

After submission of the above assessment that confirms arsenic concentrations are consistently below 25 ppb and the supply is sustainable for that concentration of arsenic, consideration may be given for a preliminary layout approval in respect to water quality. The preliminary approval in respect to water quality will be conditional on the registration of restrictive covenants entered into with VCH as the grantee. The restrictive covenants should express cautionary advise, including:

1. That a point of entry or point of use treatment device capable of removing arsenic below the maximum acceptable concentration (MAC) in the Guideline for Canadian Drinking Water Quality must be installed at each residence.
2. That the treatment device requires regular maintenance in order to ensure potable water.
3. The water treatment device includes a fail safe alarm.
4. That the water should be tested annually to ensure proper operation and maintenance of the treatment units. The analysis for arsenic to include a detection limit below the maximum acceptable concentration in the Guidelines for Canadian Drinking Water Quality.
5. That if the property owner drills additional deep wells on the parcel, there is a risk that naturally occurring arsenic may be prevalent in the water and may pose health risks to consumers of the water.
6. That the grantee of the covenant be released from liability and costs.

Test results: 0.2 – 10 ppb

If arsenic is present in the well water, but the concentration does not exceed 10 ppb, the restrictive covenant should provide cautionary advise, including:

1. That drinking water guidelines and health risk knowledge can change over time.
2. Record the level of arsenic determined at the time of subdivision registration and the present maximum acceptable concentration (MAC) in the Guidelines for Canadian Drinking Water Quality.
3. That VCH recommends the installation of treatment units to reduce the arsenic concentration to a level “as low as reasonably achievable” as recommended in the Guidelines for Canadian Drinking Water Quality.
4. Potential changes in the concentration of arsenic from the well due to the development of a depression cone and migration of ground water from greater distances over time.
5. Include an annual analysis for arsenic from an accredited lab that includes a detection limit below the maximum acceptable level for arsenic in the Guidelines for Canadian Drinking Water Quality.
6. That the grantee of the covenant be released from liability and costs.

The DWO may recommend additional limitations in the restrictive covenants above which limits the number of dwellings permitted on the parcel. Dwellings limitations may be warranted due to a minimal amount of water available at acceptable arsenic concentrations, cumulative impacts of water use in the area, excessive demands on an aquifer, or potential well water contamination.

Shallow or dug wells (less than 15 m) may be considered an alternate water source on proposed individual parcels that have unacceptable levels of naturally occurring arsenic from drilled wells, provided that the water source is sustainable year round and drinking water is treated. Shallow wells pose concerns of ongoing supply during dry periods and microbiological contamination from surface water influences. Shallow wells may require treatment for other parameters.

It is therefore recognized that shallow wells cannot provide potable water without further treatment. This guideline is intended to address shallow well proposals for subdivision approval only in areas where elevated arsenic in ground water is known to exist or potentially could exist in the opinion of a qualified professional or Environmental Health Officer. Deep or drilled wells are the preferred option in areas that do not have arsenic problems or other parameters that pose significant health risks.

Assessment Criteria

Subdivision applicants that propose shallow wells as the water source for proposed parcels must provide a report from a geoscientist, professional engineer licensed to practice in British Columbia or a certified well driller. The report must include sealed documentation submitted to the Approving Officer to confirm:

1. That the proposed well will provide a minimum of 2720 liters/day (500 gallons/day) on a sustained basis throughout the year for each proposed parcel.
2. Recognizing that treatment will be necessary for microbiological parameters; a water analysis by an accredited laboratory, which confirms water quality in accordance with the Guidelines for Canadian Drinking Water Quality.

Preliminary Layout Approval

If the report from the geoscientist, professional engineer or certified well driller confirms a sustainable water supply from the shallow well and acceptable water quality (with microbiological treatment), a restrictive covenant will be considered by VCH and recommended to the Approving Officer for consideration in a Preliminary Layout Approval. A restrictive covenant (Section 219, *Land Title Act*) registered against the title of each property in this case would include the following:

1. That a shallow well has been assessed for year round use on the property by a licensed geoscientist, professional engineer or certified well driller.
2. That a point of entry or point of use treatment device must be installed at each residence to provide potable water.
3. That the water treatment device requires regular maintenance in order to ensure potable water.
4. That the water should be tested annually to ensure proper operation and maintenance of the treatment units.
5. That if the property owner drills a deep well on the parcel, there is a risk that naturally occurring arsenic may be prevalent in the water and may pose health risks to consumers of the water.
6. Limits the number of dwellings permitted on the parcel based on the amount of water available, cumulative impacts of water use in the area and demands on an aquifer, or potential for contamination.
7. That the grantee of the covenant be released from liability and costs.

This is a sample document for the convenience of subdivision proponents. It is strongly recommended that restrictive covenants be prepared by a lawyer.

⇒ Insert Form C and D

TERMS OF INSTRUMENT - PART 2

WHEREAS:

A. The Grantor is the registered owner in fee simple of:

P I D

(the "Land")

- B. The Grantee is the Vancouver Coastal Health Authority with offices at _____
- C. The Grantee has been designated by the Minister of Sustainable Resource Management under section 219 (3) (c) of the *Land Title Act*;
- D. The Grantee has agreed to register this covenant under Section 219(4) of the *Land Title Act* to facilitate approval of the subdivision of the Land and to effect the filing, prior to construction of a sewerage system required under Section 8 of the Sewerage System Regulation of the *Public Health Act* (the "Regulation"), and
- E. The Agricultural Land Commission has consented to the registration of this Agreement. (delete if not applicable)

NOW THEREFORE, in consideration of the premises and the covenants herein contained and for other valuable consideration, receipt and sufficiency of which is hereby acknowledged by the parties, the parties hereto covenant and agree with the other as follows:

1. The Grantor covenants and agrees that
 - a) The part of the Land shown outlined in black or otherwise designated as "sewerage system and discharge area" on Reference Plan [insert Land Title Office plan number] referred to as the "Covenant Area" will be used for sewerage system purposes only;
 - b) The Grantor's use of the Covenant Area is further restricted to installation, repair and replacement of a Type 1 sewerage system, as defined in the Regulation; which accommodates limited sewage flow from no more than one single family dwelling, to a maximum of a three bedroom dwelling;
 - c) The use of the Covenant Area will continue to be restricted as set out in subparagraph (b) despite permission given to the Grantor by other authorities having jurisdiction to construct or occupy more than one dwelling on the Land;
 - d) That any sewerage system installed, constructed or brought on to the Land shall be located only within the Covenant Area unless other locations are available on the Land for additional systems that comply with the Regulation or the Municipal Sewerage Regulation under the *Environmental Management Act*, and;
 - e) If, under subparagraph 1(d) of this Agreement, there are locations available for a sewerage system other than in or on the Covenant Area, the Covenant Area shall nevertheless continue to be set aside and reserved in accordance with subparagraph 1(a) hereof.
 - f) For the purposes of this Agreement, the terms "discharge area", "filing" and "sewerage system" shall have the meaning ascribed to them by the Sewerage System Regulation under the British Columbia Public Health Act and or any successor legislation.

2. The Grantor and the Grantee agree that the enforcement of this Agreement shall be entirely within the discretion of the Grantee and that the execution and registration of this covenant against the title to the Land shall not be interpreted as creating any duty on the part of the Grantee to the Grantor or to any other person to enforce any provision, or the breach of any provision, of this Agreement.
3. Nothing contained or implied herein shall prejudice or affect the rights and powers of the Grantee in the exercise of its functions under any public or private statutes, bylaws, orders and regulations, all of which may be fully and effectively exercised in relation to the Land as if the Agreement had not been executed and delivered by the Grantor.
4. The Grantor hereby releases and forever discharges the Grantee of and from any claim, cause of action, suit, demand, expenses, costs and legal fees whatsoever which the Grantor can or may have against the said Grantee for any loss or damage or injury that the Grantor may sustain or suffer arising out of the issuance of a Permit or acceptance of a filing under this Agreement or arising out of any breach, violation or non-performance of any term, condition, covenant or other provision of this Agreement.
5. The Grantor covenants and agrees to indemnify and save harmless the Grantee from any and all claims, causes of action, suits, demands, expenses, costs and legal fees whatsoever that anyone might have as owner, occupier or user of the Land, or by a person who has an interest in or comes onto the Land, or by anyone who suffers loss of life or injury to his person or property, that arises out of the issuance of a Permit or the acceptance of a filing under this Agreement or arising out of any breach, violation or non-performance of any term, condition, covenant or other provision of this Agreement.
6. It is mutually understood, acknowledged and agreed by the parties hereto that the Grantee has made no representations, covenants, warranties, guarantees, promises or Agreements (oral or otherwise) with the Grantor other than those contained in this Agreement.
7. This Agreement shall be registered as a first charge against the Land and the Grantor agrees to execute and deliver all other documents and provide all other assurances necessary to give effect to the covenants contained in this Agreement.
8. The Grantor shall pay the legal fees of the Grantee in connection with the preparation and registration of this Agreement and shall provide the Grantee with a registered copy of it.
9. The Grantor covenants and agrees for itself, its heirs, executors, successors and assigns, that it will at all times perform and observe the requirements and restrictions hereinbefore set out and they shall be binding upon the Grantor as personal covenants only during the period of its respective ownership of any interest in the Land.
10. The restrictions and covenants herein contained shall be covenants running with the Land and shall be perpetual, and shall continue to bind all of the Lands when subdivided, and shall be registered in the Victoria Land Title Office pursuant to Section 219 of the *Land Title Act* as covenants in favour of the Grantee as a first charge against the Land.
11. This Agreement shall ensure to the benefit of the Grantee and shall be binding upon the parties hereto and their respective heirs, executors, successors and assigns.

12. Wherever the expressions "Grantor" and "Grantee" are used herein, they shall be construed as meaning the plural, feminine or body corporate or politic where the context or the parties so require.
13. The Grantor agrees to do or cause to be done all things and execute all other documents and provide all other assurances necessary to give effect to the covenants contained in this agreement.
14. This Agreement will be interpreted according to the laws of the Province of British Columbia.
15. _____, the registered holder of a charge by way of _____ against the within described property which said charge is registered in the Land Title Office at Victoria, British Columbia, under number _____, for and in consideration of the sum of One Dollar (\$1.00) paid by the Grantee to the said Chargeholder (the receipt whereof is hereby acknowledged), agrees with the Grantee, its successors and assigns, that the within Section 219 Covenant shall be an encumbrance upon the within described property in priority to the said charge in the same manner and to the same effect as if it had been dated and registered prior to the said charge.
16. This Agreement will not be modified or discharged except in accordance with the provisions of Section 219 of the Land Title Act.

AND IT IS UNDERSTOOD AND AGREED by and between the parties hereto that the words "Grantee" and "Grantor" wherever used in this Agreement shall include the parties hereto and their respective heirs, executors, administrators, successors and assigns.

This is the instrument creating the condition of covenant entered into under Section 219 of the *Land Title Act* by the registered owner referred to herein and shown on the print of the plan annexed hereto and initialled by me. Plans are to include the subdivision plan and any applicable reference plans.

Approving Officer

IN WITNESS WHEREOF the parties hereto hereby acknowledge that this Agreement has been duly executed and delivered by the parties executing Form C (page(s)1 and 2) attached hereto.

A restrictive covenant was registered on title of the property at the time of the original subdivision to protect the primary and reserve absorption field sites. Consideration will be given to amend the restrictive covenant on a parcel provided that the amended area is equal or better to the existing covenant site and meets the requirements in Tables A and B in the Subdivision Guideline.

The application to amend the covenant must include:

1. A completed Application and Site Assessment Information form (page 29).
2. A copy of the existing Section 215 or 219 covenant and Reference Plan.
3. A detailed plot plan of the parcel drawn to scale.

Once the application is complete, submit all the documents to the local VCH office. Submit a fee of \$200 per covenant area revision (make the cheque payable to Vancouver Coastal Health).

The Environmental Health Officer will review the application, complete a site assessment to confirm the site conditions and provide a written response. If the information is insufficient, the EHO will contact you for further details.

Upon receipt of approval from the EHO, a new restrictive covenant can be prepared for the site (contact a lawyer or notary public for assistance). The new area designated as the "Covenant Area" must be completed as a Reference Plan. The existing covenant must be released from title and both documents executed at the same time. The Environmental Health Officer will sign the new covenant as "the grantee on behalf of the Vancouver Coastal Health Authority".

For further information on restrictive covenants refer to Appendix 5 (page 25), of the Subdivision Guideline or contact an EHO in your area.

Vancouver Coastal Health Offices

Powell River:	604-485-3310
Sechelt:	604-885-5164
Squamish:	604-892-2293
Whistler:	604-932-3202
North Vancouver:	604-983-6793

