SECTION 2

2 SITE ASSESSMENT

2.1 INTRODUCTION

Site assessment includes evaluation of a lot at the subdivision stage, or at the time that an on-site system is selected or designed.

This section of the Guidelines outlines:

- approval procedures, including information that must be assembled and reported
- site assessment reports
- basic considerations that are involved in assessment of a lot
- soil assessment
- determination of minimum area and width of a lot
- minimum clearance distances from wells, boundaries, and other features.

Later sections of the Guidelines deal with selection and design of systems.

2.2 APPROVAL PROCEDURES

When a property is subdivided, or when approval is sought to construct or install an on-site system, information about the site and the proposed system must be submitted, by a subdivider or a person proposing to install an on-site system.

2.2.A When a property is subdivided:

1. A subdivider must submit documentation to the development officer that includes:

    a. the name, address, including civic number, and telephone number of the owner of the lot to be subdivided;
    b. the name, address, including civic number, and telephone number of the subdivider;
    c. the name and address, including civic number, of all owners of land abutting the lot to be subdivided;
    d. for a subdivider who is not the owner of the lot, proof from the owner that the subdivider is appointed as the agent of the owner to make the application;
    e. a plan or sketch of the lot to be subdivided showing all of the following:
        (i) the dimensions and area of the lot,
        (ii) the lot layout, including all of the following, whether proposed or existing:
            (A) buildings,
            (B) systems,
            (C) driveways,
            (D) water wells,
        (iii) the location of all the following:
            (A) surface watercourses,
            (B) wetlands,
            (C) marine water bodies,

(D) any features that may influence the selection or design of the system including any ditches, roads or easements,

(iv) the surface slopes and directions,

(v) the location of any test pits,

f. an explanation of all of the following:

(i) the extent to which the system will be used,

(ii) the expected volume for the system,

(iii) what uses the system will be subjected to.

2. In addition to the information provided under subsection (1), a subdivider must provide the Department with an assessment report prepared by a level 1 qualified person or a level 2 qualified person that assesses the lot's suitability to support a system and includes an evaluation of the results of a soil assessment, the proposed system selected or designed for the lot and any other information required by the Department.

3. The lot size and width must satisfy requirements of Section 7 of the *On-Site Sewage Disposal Systems Regulations.*

4. Submission Standards must be in accordance with the department's "Submission Standards for Applications"; refer to **Appendix H.**

5. The role of the department is to determine whether the lot(s) are suitable based on the information provided.

2.2.B When an application is made to construct or install a system:

1. The applicant must complete and submit an "Application for Approval - On-site Sewage Disposal" form or a form that includes:

a. the name, address, including civic number, and telephone number of the owner of the lot;

b. a plan or sketch of the lot to be subdivided showing all of the following:

(i) the dimensions and area of the lot,

(ii) the lot layout, including all of the following, whether proposed or existing:

(A) buildings,

(B) systems,

(C) driveways,

(D) water wells,

(iii) the location of all the following:

(A) surface watercourses,

(B) wetlands,

(C) marine water bodies,

(D) any features that may influence the selection or design of the system including any ditches, roads or easements,

(iv) the surface slopes and directions,

(v) the location of any test pits,

c. an explanation of all of the following:

(i) the extent to which the system will be used,

(ii) the expected volume for the system,

(iii) what uses the system will be subjected to.

d. information about the proposed water supply on the lot and existing supplies on adjacent properties.
e. locations that indicate compliance with clearance distances.
f. details indicating that selection/design specifications in the Regulations and Guidelines are met.
g. any other information required by an inspector, which may include a plan of survey or additional test pits.

2. In addition to the information provided under subsection (1), an applicant must provide the Department with an assessment report prepared by a level 1 qualified person or a level 2 qualified person that assesses the lot's suitability to support a system and includes an evaluation of the results of a soil assessment, the proposed system selected or designed for the lot.

The plan or sketch of a lot that is submitted by an applicant to construct or install a system must include:

(i) lot dimensions and area
(ii) lot layout, including buildings, proposed system, proposed driveway, and wells
(iii) location of features that may influence the design of the system, including watercourses, wetlands, wells, ditches, roads, and driveways within 60 m of any part of the proposed system.
(iv) surface slopes and directions
(v) design capacity of the on-site system and;
(vi) must be in accordance with the departments "Submission Standards for Applications" **(Appendix H)**

This information will also be required by a qualified person or an inspector who prepares an assessment report or selects or designs an on-site system.

2.3 SITE ASSESSMENT REPORTS

A site assessment report that is required at the subdivision or system approval stage deals with the suitability of a site to support an on-site system, and must include results of a soil assessment at the location of the proposed disposal field.

The site assessment must therefore take into consideration all of the information that is detailed in Section 2.

2.4 BASIC CONSIDERATIONS IN SITE ASSESSMENT

Basic considerations in the assessment of a site(s), for their suitability to install an on-site system include:

- slopes and surface drainage
- bedrock
- changes in grade
- watercourses and wetlands
- traffic areas
- types of natural vegetation
- well locations
- soil assessment
- groundwater elevation

Each of these considerations is discussed below. **Table 2.5 (A and B)** lists other features that should be identified and located during assessment of a lot.

2.4.1 Slopes

There are exceptions, but the typical soil type in Nova Scotia is glacial till with increasing compaction with depth. The top few feet of soil are typically more permeable than subsequent depths due to root penetration, weathering, etc. As a result, water either from rainfall or from an on-site sewage disposal system, tends to flow downslope through this permeable layer until such time as it is able to penetrate the deeper soil, evaporate, break to the surface, or enter a watercourse.

Steep slopes in combination with poor soil conditions make the design, installation and operation of an acceptable on-site disposal system difficult or even unacceptable. For example, a system installed in a very shallow soil on a lot with a steep slope is more likely to malfunction than a system in similar soil conditions on a lot with only a moderate slope.

Surface slopes also affect the type of on-site system that can be installed. **Table 4.2** lists maximum and minimum slopes that apply to systems discussed in these Guidelines.
The location of a disposal system on a slope is important. Groundwater moving down the slope too near the surface can be contaminated by intercepting the effluent before the latter is adequately treated. Run-off from up-slope areas may flood the disposal field.

Thus poorly drained soils, shallow soils, areas of high groundwater level or areas receiving large volumes of run-off should be avoided.

Assuming all other parameters are constant, the best location for a system on a slope is at or near the crest. Areas further down the slope may require upslope interceptor trenches to catch and divert surface run-off and/or groundwater away from the disposal field. **(Figure 1.B)**.

The overall slope on the lot also can affect the foundation elevation, whether or not pumping is required, and the type and design of the disposal system. For example, on a lot with little slope, plumbing could not be installed in a full basement without pumping to the disposal system. However, on a sloping lot pumping may not be necessary. A long narrow system installed parallel to the contour is preferred on a sloping lot. It not only blends into existing grades, but spreads the effluent across a longer slope interface and as a result is more likely to function satisfactorily.

2.4.2 Bedrock

If untreated effluent enters fractures in bedrock, it can easily contaminate wells hundreds of feet away. Rock outcrops on a lot may indicate limited soil cover over bedrock. The depth to bedrock is a key consideration in determining the type of system which may be placed on the property. The *On-Site Sewage Disposal Systems Regulations* require a minimum vertical separation distance of 1 metre between the bottom of the distribution trench and any bedrock.

2.4.3 Changes in Grade

Distance from a disposal system to abrupt changes in grade is also an important consideration on a lot. Effluent from the system may break out at the surface if it has not already entered the subsoil. Adequate separation distances from breaks in slope (cliffs, banks, etc.) are therefore required (**Table 2.5**).

2.4.4 Watercourses and Wetlands

Contamination of watercourses and wetlands can threaten public health (e.g. swimming areas or water supplies) and/or the environment. (**Table 2.5**)

2.4.5 Traffic Areas

Care should be taken to avoid pre-existing roads or traffic areas on a lot for the location of the disposal field, because soil compaction can severely limit the operation of the field.

Heavy machinery should be kept off the disposal field and the immediate downslope area during construction. Automobiles and all heavy traffic should be kept off the completed disposal field to avoid crushed pipes, broken joints, or soil compaction.

2.4.6 Type of Natural Vegetation

An assessment of the vegetation type on a lot may give an indication of the soil conditions. The presence of alders and rushes may be evidence that a lot has saturated soils.

2.4.7 Well Locations

Locations and types of existing or proposed wells on the lot, or existing wells on adjacent properties, must be determined and taken into consideration in siting an on-site system.

2.5 SOIL ASSESSMENT

Assessment of soil conditions is the most important consideration in site evaluation and system selection or design. Only soils that are in their natural state are to be utilized in the evaluation process; locations where soils have been removed, added/infilled, compacted, etc., should not be considered in the evaluation process unless approval to do so is received from the Department.

2.5.1 Soil Assessment Methods

Soil assessment involves:

- Examination of test pits
- Testing of soil permeability

2.5.1.a Test Pits

Test pits provide information about the soil profile at the proposed location of a disposal field. Test pits are assessed from the top ground surface downward and in most cases the permeable soils utilized in determining lot sizing or system type are those located directly below the organic layer. This information must include the following **(Figure 2A)**:

- Organic layer
- Total soil depth over water table and/or bedrock
- Depth of permeable soil
- Total depth of test pit
- Root penetration
- Depth to bedrock
- Depth to layer of soil with unacceptable permeability (refer to **Table 2.1**)
- Determination of highest seasonal water table
  - Presence and depth of mottling
  - Depth to water
  - Moisture content (saturated, moist, dry, etc.)
  - Perched water table
- Soil profile:
  - Description of soil (including all soil encountered in the test pit)
  - Depth of each layer
  - Texture of soil **(Table 2.2)**
  - Moisture content (saturated, moist, dry, etc.)
  - Density (loose, medium, compact, tight)
  - Colour
  - Structure

For safety, the pit should be no more than 1.2 m deep, with sloping sides and an entrance ramp for easy access and escape in the event of a soil slide. All soil removed from the pit should be placed a minimum of 1 m from the edge of the pit. If the pit is dug by backhoe and verification of subsoil conditions is required, the pit may be taken to a greater depth, but inspection should be carried out from the surface with the aid of samples of soil recovered by the machine bucket. A soil profile can then be recorded based on the variation in soil characteristics with depth.

ALL TEST PITS MUST BE DUG IN COMPLIANCE WITH THE OCCUPATIONAL HEALTH AND SAFETY REQUIREMENTS OF NOVA SCOTIA LABOUR AND WORKFORCE DEVELOPMENT.

2.5.1.b In-situ Permeability Tests

These tests can be used to confirm the estimation of soil permeability based on the visual assessment of soil properties in the test pit. When using these tests to verify results, a minimum of three tests should be done. If the three tests are not of similar order of magnitude, more tests should be conducted.

These tests may also be used for the:

- Determination of a particular sandy gravel as a soil with acceptable or unacceptably high permeability.
- Determination of a particular soil as an unacceptably low or an impermeable soil.
- Confirmation of visual assessment of soils for higher flow systems, such as commercial and institutional buildings.

An example of an in-situ test is provided in **Appendix C**. Other in-situ tests can be used, provided they are approved by the department.

2.5.2 Soil Types

Assessment of soil in which on-site systems are to be installed must recognize two roles that soils play in the performance of these systems

- Providing a pathway for effluent to move away from the disposal field.
- Removal of some contaminants as effluents pass through the soil.

Table 2.1 summarizes the permeability of each soil type. **Appendix D** provides additional information about the movement of water through soils.

The depth of permeable soil is critical in the determination of minimum lot dimensions. Soils are assessed from the top ground surface downward and in most cases the permeable soils utilized in determining lot sizing are those located directly below the organic layer. **A permeable soil is a soil, in its natural state, with a saturated hydraulic conductivity (permeability) between 0.000003 (3×10^{-6}) and 0.0005 (500×10^{-6}) m/sec. Table 2.1**, which lists values of permeability for various soil types, indicates soils that this definition would include as:

- medium to coarse sand

- fine sandy gravel
- silty sand
- sandy silt

Natural soils with permeabilities greater than 0.0005 m/sec are considered to have unacceptably high permeability and are so coarse that they may permit the passage of contaminants. These include:

- rock, clean gravel

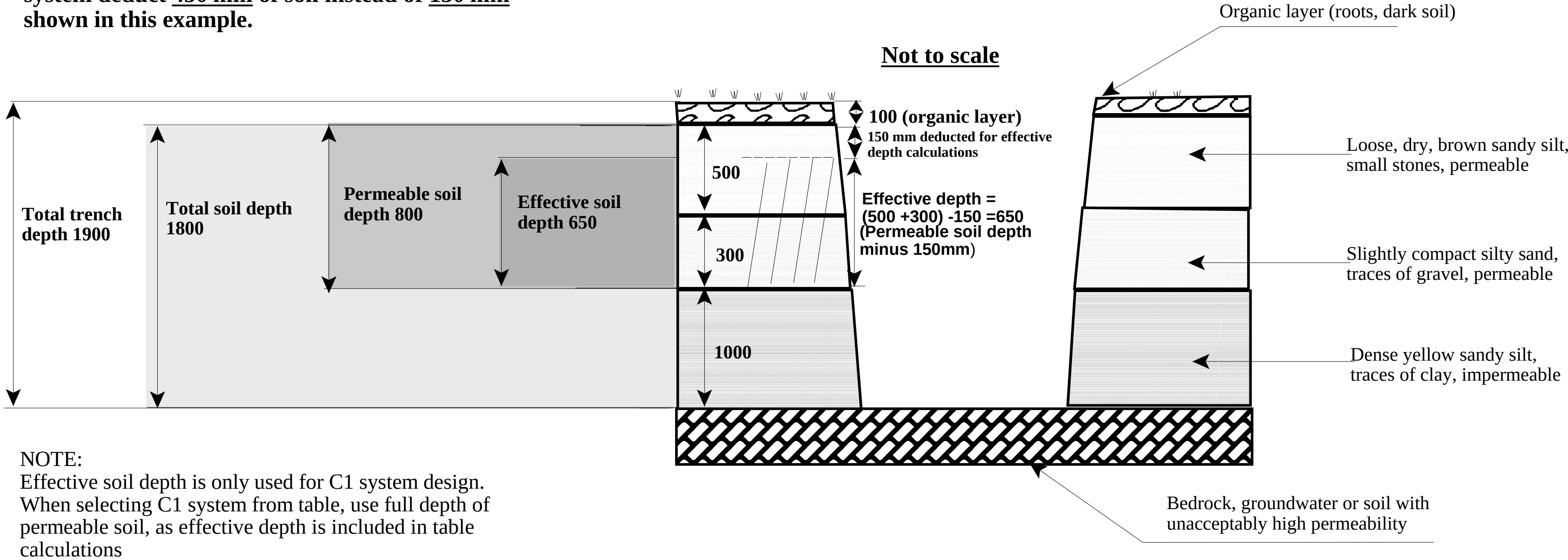
Natural soils with permeabilities less than 0.000003m/sec are considered to have unacceptably low permeability. These include:

- clayey silt
- silty clay
- clay

FIGURE 2.A

NOTE:
Example below shows effective depth calculation for a raised C1 system. For a fully trenched C1 system deduct 450 mm of soil instead of 150 mm shown in this example.

TEST PIT



NOTE:
Effective soil depth is only used for C1 system design. When selecting C1 system from table, use full depth of permeable soil, as effective depth is included in table calculations

INFLUENCE OF TOPOGRAPHY

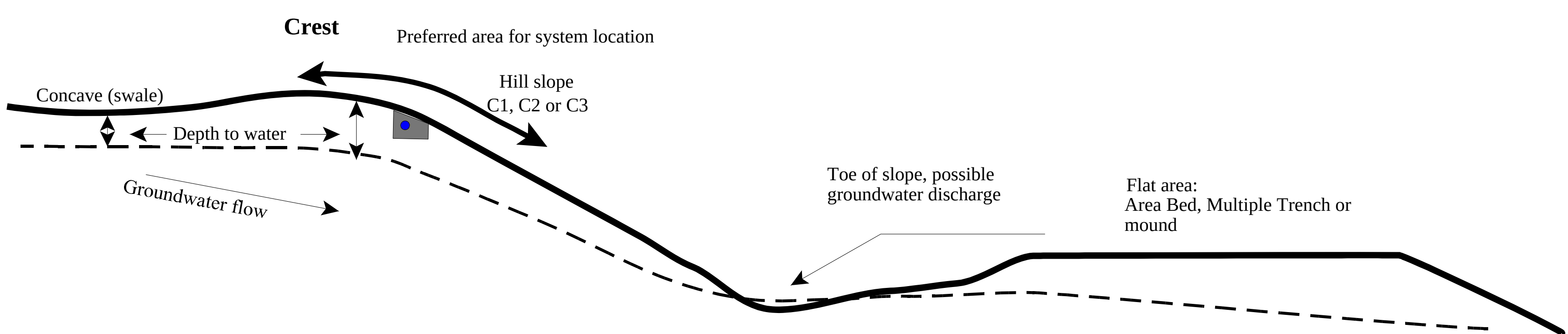


TABLE 2.1

A GUIDE TO APPROXIMATE SOIL PERMEABILITIES

SOIL TYPE	**PERMEABILITY** (m/sec) x 10^{-6}		
	PERMEABILITY CLASS	**RANGE**	**AVERAGE**
Rock, Clean Gravel	Unacceptably High	>800	
Medium to Coarse Sand	Acceptable	20 - 800[(1)]	
Fine Sandy Gravel	Acceptable	20 - 80	50
Silty Sand	Acceptable	8 - 20	15
Sandy Silt	Acceptable	3 - 8	5
Clayey Silt	Unacceptably Low	0.8 - 3	1.5
Silty Clay	Unacceptably Low	0.2 - 0.8	0.5
Clay	Unacceptably Low	<0.8	

(1) - acceptable permeability limit is 500 * 10^{-6} m/s

NOTE:

- Because of the wide range in permeabilities for sand, it is not appropriate to use an average permeability. Unless the permeability of the material is measured in situ, the lowest permeability for fine sandy gravel, 20 x 10^{-6} m/sec, should be used for system design/selection.

- Because of the low permeability of silty clays and clays the assumptions made regarding the permeability of the clogging mat for more permeable soils may not apply for these soils with low permeability. This combined with the effects of natural precipitation may result in lower effective permeabilities down slope of systems in these soils. Considering these points it is not appropriate to design an area bed, multiple trench or C1 type system for these soils even if the theoretical calculated size can be fit on the lot.

- These soil types are based on texture, the relative content of rock, sand, silt, and clay. It is extremely difficult to accurately determine the long term acceptance rate of soil particularly when basing it only on soil texture. Other factors such as soil density, particle gradation, and soil structure combine to give different permeabilities to soils with similar textures. Unless the permeability is established by in- situ measurement, or the designer has extensive experience in soil assessment, it would be advisable to use the lowest permeability in the range given for each soil type.

2.5.3 Soil Properties

Some soil properties that are useful in assessing soil suitability include: texture, structure, colour, density, and depth.

2.5.3.a Texture

Soil texture is the relative amount of gravel, sand, silt and clay content. Some soil classes and ways of identifying them are given in **Table 2.2.** When water passes through soil, it goes through the voids between soil particles and not the solid particles themselves. In most cases this means that the larger the voids or pore spaces, and the more pore spaces, the faster the water will pass through the soil. For example, if a sand is compared to a clay it is apparent that the sand has many large voids between relatively large particles whereas the voids between the small clay particles are so small that little, if any, water can pass through. A sand has a high permeability, a clay a very low permeability.

2.5.3.b Structure

In some soils, individual particles tend to group together into blocks or units called peds. If these peds have a characteristic shape, the soil is said to have structure. The space between these peds and how they are aligned can influence the ability of water to move within the soil and may affect a permeability test, giving a false impression of higher permeability. Soils with a platy structure can have a much lower permeability than would be indicated only on the basis of soil texture. For the purpose of these Guidelines, the only further mention of structure will be in Section 6, concerning construction damage. However the qualified person must be aware of the influence that structures may have on soil permeability when conducting the site assessment.

2.5.3.c Colour

Soil colour is a property that is useful in soil assessment. Colour and colour patterns provide clues towards estimating the ability of a soil to absorb water. There are complex colour charts for soil colour determination, which are beyond the scope of these Guidelines. Much of our soil colour is due to the presence of iron. When there is no air in the soil, iron exists in a state that is greyish. When air is abundant in the soil, the soil is well drained, iron is in a state which is yellowish or reddish. If over a long period of time a soil has been alternately wet and dry, it may show defined spots or blotches of different colour, possibly with a grey or dark predominant colour, this is known as mottling. This would indicate that at times (usually spring and fall) this soil is saturated, i.e., poorly drained. On the other hand a well drained soil would be a relatively bright colour (often reddish yellow) and be free of mottling to at least 1.2 metres in depth.

2.5.3.d Density

Soil density or degree of compaction can influence the ability of soils to accept water. Two soils with similar textures can have different permeabilities if their densities are different. The denser a soil becomes, the smaller the pore spaces and the slower the rate of water movement. The natural soil conditions in Nova Scotia are mainly the result of the last glacial age. In many areas the soil is comprised of glacial till, an assortment of material ranging from rocks to clay, that was deposited beneath the ice and subject to great compactive forces. Other areas have soils consisting of sediments deposited by melt water streams that tend to be less compact. Although the top few feet of till tend to have been loosened by weathering and root action, it is common to find increasing compaction with depth and extremely dense and impervious till below a couple of feet.

Soil can also be compacted by actions such as running heavy machinery over it. For a further discussion of man-made compaction, refer to Section 6.

2.5.3.e Depth

Key information in the selection or design of a soil disposal system is the depth of permeable soil, and the depth to a seasonally high water table, bedrock or too permeable soil. Test pits are assessed from the top ground surface downward and in most cases the permeable soils utilized in determining lot sizing or system type are those located directly below the organic layer.

2.5.4 Effective soil depth

Soil effective depth, is the depth of unsaturated permeable soil beneath the surface layer of sod or other organic soil minus 150mm (C1 raised) or 450 mm (C1 Fully trenched) as illustrated by **Figure 2.A**. Soil effective depth is the depth of unsaturated permeable soil that will be allowed to be saturated when the disposal field is loaded at the average rate and effluent is flowing laterally away from the field. The determination of effective soil depth is necessary for C1 system design only. However the effective soil depth has already been allowed for in the selection tables so you will not have to calculate it into your assessment.

TABLE 2.2

TEXTURAL PROPERTIES OF MINERAL SOILS FEELING AND APPEARANCE

Soil Class	Dry Soil	Moist Soil
Rock, Clean gravel	Granular material with few fines. Low percentage of particles less than 2.0 mm	Granular material with few fines. Does not ribbon or form a cast. Low percentage of particles less than 2.0 mm
Medium to Coarse Sand	Sand size (0.2 to 2.0 mm) particles dominate. Aggregates easily crushed when rubbed, feels gritty.	Sand size particles (0.2 to 2 mm) dominate. Squeezed in hand the medium sand will form a weak cast, the coarse sand will not form a cast. Does not form a ribbon.
Fine Sandy Gravel	Loose stones and single grains which feel gritty. Squeezed in the hand, the soil mass falls apart when the pressure is released.	Squeezed in the hand, it forms a cast which crumbles when touched. Does not form a ribbon between thumb and forefinger.
Silty Sand	Aggregates easily crushed; very faint velvety feeling initially but with continued rubbing the gritty feeling of sand soon dominates.	Forms a cast which bears careful handling without breaking. Does not form a ribbon between the thumb and forefinger.
Sandy Silt	Aggregates are crushed under moderate pressure; clods can be quite firm. When pulverized, soil has velvety feel with continued rubbing. Casts bear careful handling.	Cast can be handled quite freely without breaking. Very slight tendency to ribbon between the thumb and forefinger. Rubbed surface is rough.
Clayey Silt	Aggregates are firm but may be crushed under moderate pressure. Clods are firm to hard. Smooth, flour-like feel dominates when soil is pulverized.	Cast can be freely handled without breaking. Slight tendency to ribbon between thumb and forefinger. Rubbed surface has a broken or rippled appearance.
Silty Clay	Very firm aggregates and hard clods that strongly resist crushing by hand. When pulverized, the soil takes on a somewhat gritty feeling due to the harshness of the very small aggregates which persists.	Cast can bear much handling without breaking. Pinched between the thumb and forefinger, it forms a ribbon whose surface tends to feel slightly gritty when dampened and rubbed. Soil is plastic, sticky and puddles easily.
Clay	Aggregates are hard; clods are extremely hard and strongly resist crushing by hand. When pulverized, it has a grit-like texture due to the harshness of numerous very small aggregates which persist.	Casts can bear considerable handling without breaking. Forms a flexible ribbon between thumb and forefinger and retains its plasticity when elongated. Rubbed surface has a very smooth, satin feeling. Sticky when wet and easily puddled.

soils with unacceptable permeability

soils with acceptable permeability

2.6 DETERMINATION OF SYSTEM USAGE

A subdivider, or applicant to construct or install a system, is required to specify the extent, volume, and type of usage to which the system will be subjected.

This information will be used by a qualified person or the department to select or design an on-site system. The size of the system may dictate the lot size at subdivision stage, which would be in addition to the minimum lot size requirements set out in Section 7 of the *On-site Sewage Disposal Systems Regulations*, shown in **Table 2.4**.

For single-unit dwellings, the minimum information required is the number of bedrooms, the expected maximum occupancy of the dwelling, and whether allowance should be made for high water use fixtures.

The minimum flow on which planning, selection or design of a residential on-site system can be based is 1000 L/day. The recommended flows to be used for system design are shown in **Table 2.3** below**.**

TABLE 2.3

DAILY FLOWS

Dwelling Type	Average Daily Flow (L/day)
3 bedroom home	1000
3 bedroom home with high water use fixtures	1200
4 bedroom home	1350
4 bedroom home with high water use fixtures	1500

These are average flows. It should be recognized that if they are exceeded for more than short periods, the results may be a malfunction of the on-site disposal field.

For system selection as determined by a level 2 Qualified Person (Section 4), an average daily flow of 1000 L/day is to be used for a single 3 bedroom home. For a 3 bedroom home with high water use fixtures, or for any 4 bedroom home, an average daily flow of 1500 L/day is to be used with the exception that a daily flow of 1350 L/day may be used when selecting a C3 or mound system for a 4 bedroom home without high water use.

A garbage grinder will increase the amount of solids to be removed and stored by a septic tank. Where a garbage grinder may be installed, the volume of the septic tank should be increased by 20%.

Estimated flows and loads or systems serving multi-unit residential or non-residential units will depend on additional information to be provided by the applicant and assessed by the designer (QP 1).

2.7 MINIMUM LOT AREA AND WIDTH REQUIREMENTS

For a lot **proposed** for subdivision, intending to utilize an on-site sewage disposal system, the minimum lot areas and widths in **Table 2.4** apply. For systems with greater than 1500 L per day flow, larger lot areas and lot widths may be required. These requirements do not apply to existing lots not involved in a subdivision proposal.

The lot width, for purposes of **Table 2.4**, is the minimum width of a lot measured from the centre of the proposed or existing system to the boundaries of the lot as illustrated by **Figure 2.B**.

The minimum area and width of the lot will depend on:

- the depth of permeable soil
- the maximum expected daily flow rate
- whether the lot is a waterfront lot as defined by the Regulations
- whether an inspector considers that an adverse effect may be created

TABLE 2.4

MINIMUM LOT SIZE REQUIREMENTS FOR DEVELOPMENT UTILIZING ON-SITE SEWAGE DISPOSAL SYSTEMS[(1)]

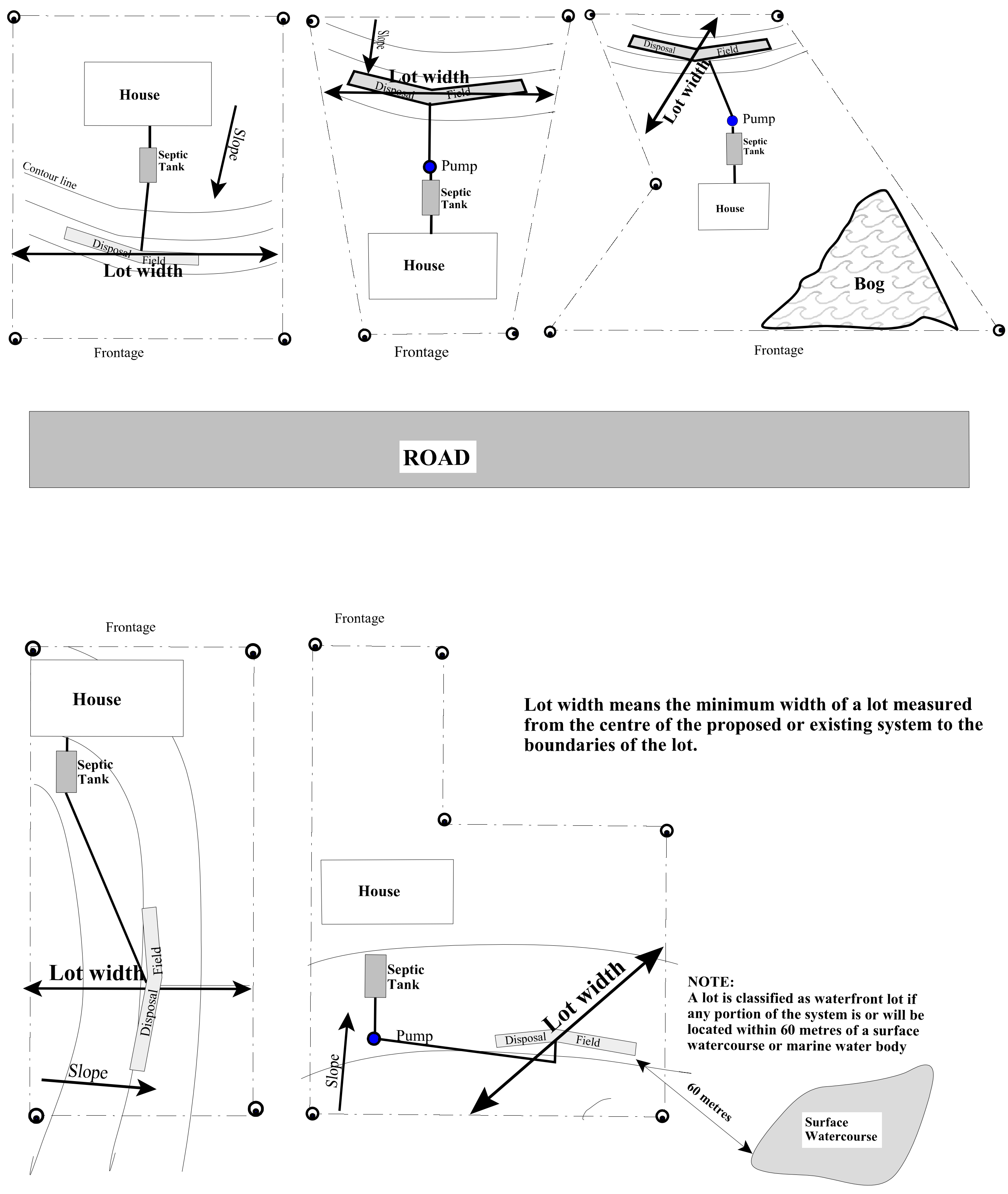
Depth of Permeable soil (mm)	Minimum Lot Area (m^2)	Minimum Lot Width (m)
0 - 149	9000	76
150 - 299	6800	60
300 to 600	4500	53
Deeper than 600 on a waterfront lot[(2)]	3716	45
601 - 899	3150	37
900 and deeper	2700	37

(1) For systems with a daily flow greater than 1500 L/day, larger lot areas and widths may be required.

(2) A waterfront lot is a lot that contains or is proposed to contain a system in which a portion of the system is or will be located within 60 m of a surface watercourse or marine water body.

FIGURE 2.B

BUILDING LOT WIDTH



Lot width means the minimum width of a lot measured from the centre of the proposed or existing system to the boundaries of the lot.

An adverse effect is defined in the *Environment Act* as an effect that impairs or damages the environment, including an adverse effect respecting the health of humans or the reasonable enjoyment of life or property.

2.8 SEPARATION DISTANCES

2.8.1 Horizontal Separation

Horizontal separation distances that must be taken into account at the subdivision or system approval stage are listed in **Tables 2.5 (A) and (B)**. These distances relate to separation of the system from features on the lot or adjacent properties.

Where the depth of permeable soil requires installation of a raised C2, a C3 or a mound type of disposal bed, partially treated effluent may discharge at the down slope toe of the buffer. In these cases the increased separation distances found in Table 2.5(B) should be maintained.

2.8.1.a Protected Water Supply

In some cases an on-site sewage disposal system may be located within a protected water supply area. In these cases the Qualified Person must determine whether it is a designated protected water area, in which case a regulation governing the water supply area may place restrictions on the use of an on-site system within the protected water supply area.

If the Qualified Person has any question whether the on-site sewage disposal system will be located in a protected water supply area, they should check with the Municipality and Water Utility Operator.
Regardless of the requirements in any regulation governing a designated protected water supply area, the Qualified Person should always consider increasing the separation distances from the system to the water supply source to ensure adequate protection of public drinking water supplies.

2.8.1.b Right of Way

In some cases, the lot may contain a right of way or easement which must be considered when determining the location for the on-site sewage disposal system. Although the system or a part thereof may be located in a right of way, the Qualified Person should consider such an option carefully before proceeding.

The intended use of the right of way/easement may impact the physical location for the system. For example; if the right of way/easement is for a surface water drainage system then the drainage system would be considered an intermittent drain or ditch and the downslope separation distances in the regulations would have to be maintained. Likewise, if the right of way/easement is for a road, the placement of the road may impact the system location; even if a road is not constructed on the right of way/easement; the fact that there is a right to travel in the area could destroy/damage part of the system should this right be exercised.

It must be clearly understood that the owner of the system will be responsible for any loss or damage to a system or adverse effect as a result of its placement in a right of way/easement.

Before locating a system or part thereof in a right of way/easement the Qualified Person should confirm that there is not another location on the lot for the placement of an on-site sewage disposal system. Should there be no other option, and the system or part thereof must be placed in a right of way/easement, then the location of the system should be clearly marked to, where possible, ensure that the area is avoided when exercising the use of the right of way.

2.8.2 Vertical Separation

To avoid contamination of groundwater, the bottom of a disposal trench must be separated from groundwater, rock, or unacceptably high permeable soil (greater than 500×10^{-6} m/sec). It is assumed that cracks or other openings in any rock, or a coarse material like gravel, will allow effluent to pass through it untreated and contaminate groundwater. In this situation system selection or design is based on vertical movement of the effluent and protection of groundwater quality.

Unacceptably low, permeable soil, if it lies above a seasonally high water table or rock will limit the downward movement of effluent, except at extremely slow rates, and should protect groundwater from contamination. In this situation, effluent leaving a system will move mainly in a horizontal direction. (Refer to section 2.8.1).

A perched water table may occur above a layer of unacceptably low, permeable soil, and if contaminated may be a threat to shallow wells or water bodies.

The Regulations require that the bottom of a distribution trench be separated by at least 1 m from groundwater, bedrock, or unacceptably high permeable soil.

The 1 m separation may be provided by natural soil or by imported sand fill used in systems described in Section 4, but may not include soils that have unacceptably high permeability.

TABLE 2.5 (A)

MINIMUM HORIZONTAL CLEARANCE DISTANCES[1]
REQUIRED IN *ON-SITE SEWAGE DISPOSAL SYSTEM REGULATIONS*

FROM	TO	DISTANCE (Metres)
System including disposal field[6], septic tank and pump or siphon chamber, holding tank or privy	All lot boundaries	3
	Downslope lot boundary	9
	Drilled well with at least 6.1 m casing[2]	15.2
	Dug well[2,3] or any other domestic water supply	30.5
System including disposal field[6], holding tank or privy but excluding septic tank, pump or siphon chamber	Cistern or any other contained water supply[8]	8
	Surface watercourse[4], wetland[5] or marine water body	30.5
	Downslope ditch or drain that flows intermittently or any artificially created water body, other than an interceptor ditch	15
	Municipal or private water distribution system[9]	6
	Foundation drainage system	6
Septic tank, pump or siphon chamber and effluent pipe	Cistern or any other contained water supply[8]	5
	Surface watercourse[4] or marine water body	15.2
	Wetland[5]	30.5
	Municipal or private water distribution system[9]	3
	Foundation drainage system	1.5

TABLE 2.5 (B)

MINIMUM HORIZONTAL CLEARANCE DISTANCES[1] THAT SHOULD BE MAINTAINED WHERE POSSIBLE

FROM	TO	DISTANCE (Metres)
Disposal Field [6]	Downslope boundary on a lot with a depth of permeable soils of: 300 to 600 mm 150 to 299 mm 0 to 149 mm	 15 25 30
	Downslope sudden increase in slope on a lot with a depth of permeable soils of: 601 mm and deeper 300 to 600 mm 150 to 299 mm 0 to 149 mm	 5 10 15 20
	Wells down slope	100 [7]
	Downslope Foundation	20
	Right of way	6

The following statements refer to Tables 2.5 (A) and 2.5 (B):

1. An inspector may require greater distances if adverse effects may be created, and shall provide reasons in writing.

2. See **Table 2.5 (B)** and note 7.

3. A dug well includes a drilled will with less than 6.1 m. of well casing

4. Surface watercourse means a watercourse as defined in the *Environment Act*, excluding groundwater and includes the bed and shore of every river, stream, lake, creek, pond, spring, lagoon or other natural body of water, and the water therein, within the jurisdiction of the Province, whether it contains water or not.

5. Wetland means a wetland as defined in the *Environment Act*, and includes land commonly referred to as a marsh, swamp, fen or bog that either periodically or permanently has a water table at, near or above the land's surface or that is saturated with water, and sustains aquatic processes as indicated by the presence of poorly drained soil, hydrophytic vegetation, and biological activities adapted to wet conditions.

6. Separation from the disposal field should be measured from the nearest edge of the trench. Ensure separation distances, especially to boundaries, incorporate the buffer and buffer taper.

7. Whenever possible disposal systems should not be immediately up slope of wells. When planning proposed subdivision layouts it is important to consider relative location of wells and disposal system to avoid problems as lot become developed.

8. A cistern or contained water supply is a container utilized for the storage of potable water but does not include a pressure tank associated with a well pumping system.

9. A municipal or private water distribution system includes the main distribution line (pipe), the lateral (pipe) from the main distribution line to the structure and the water line from a dug or drilled well to the structure.

2.9 REPLACING A MALFUNCTIONING SYSTEM

When the assessment is related to the installation of a replacement system as a result of a malfunction of the existing system (see Chapter 7 for more information related to a malfunctioning system) the qualified person must consider the following as part of the process:

- If a Qualified Person level II cannot select a system to fit on the lot, then a Qualified Person Level I may be able to design a system for the lot.

- Wherever possible the replacement system being installed on the lot must meet the separation distances in the regulations. If the separation distances as required by the regulations cannot be achieved, the Department may issue an approval that does not meet the requirements of the regulations. However, the minimum clearance distances as required by the regulations to wells on adjoining properties must be maintained wherever possible. Where minimum system clearance distances to the neighbour's well cannot be maintained, the replacement system should not be closer to the well than the original system. If the replacement system must be closer to the neighbours well than the original system, the qualified person may be required to incorporate additional measures into the selection/design of the system to protect the well.

- When a sloping sand filter or innovative system is utilized as the replacement system and results in a point surface discharge, the replacement system can only be designed for the existing sewage loading from the structure. Point surface discharge will only be permitted where subsurface distribution of effluent is not possible and risk to public health is minimal.