APPENDIX E

SELECTION EXAMPLE

Disposal System Selection Example

Site conditions:

- Slope 9%
- Test pit data:

Organic Mat	- 100 mm	*- this is not a permeable soil*
Silty sand	- 200 mm ,loose, brown	*-permeable soil*
Sandy Silt	- 790 mm, loose ,brown ,dry	*-permeable soil*
Clay	- 700 mm, dense, moist	*-not (or slow) permeable*
Silty sand	- 200 mm, loose, saturated	*-permeable but saturated, not usable for disposal field installation*

Water at 50 mm from test pit bottom and rising
Roots penetration approximately 500 mm

Project: 3 bedroom single family home

SELECTION:

1. Calculate total soil depth of test pit
   - 200 +790 + 700 + 200 = **1890 mm**
2. Calculate permeable soil depth
   - 200 + 790 = **990 mm** (organic mat, clay and saturated sandy silt are not included)
3. Calculate depth to groundwater
   - 200 + 790 + 700 = **1690 mm** (Saturated silty sand is assumed to represent ground water level Fully trenched C1 system can be installed as there is more than 1650mm of soil above ground water level)
4. Although permeable soil consist of two different soil types, the one with lower permeability will be used to make system selection. In this example we assume that we have 990 mm of sandy silt.

Selection Criteria: Flow - 1000 l ; Soil - 990 mm of sandy silt.; Slope 9%

Table 4.2 indicates a following selection choices for the lot described in this example : C1, C2, C2(r), C3. Since the cost of the system increases with the amount of imported sand fill required for its construction the most economic choice will be a C1 type sewage disposal system. It will also offer the best health protection as sewage flow is contained entirely within soil matrix.

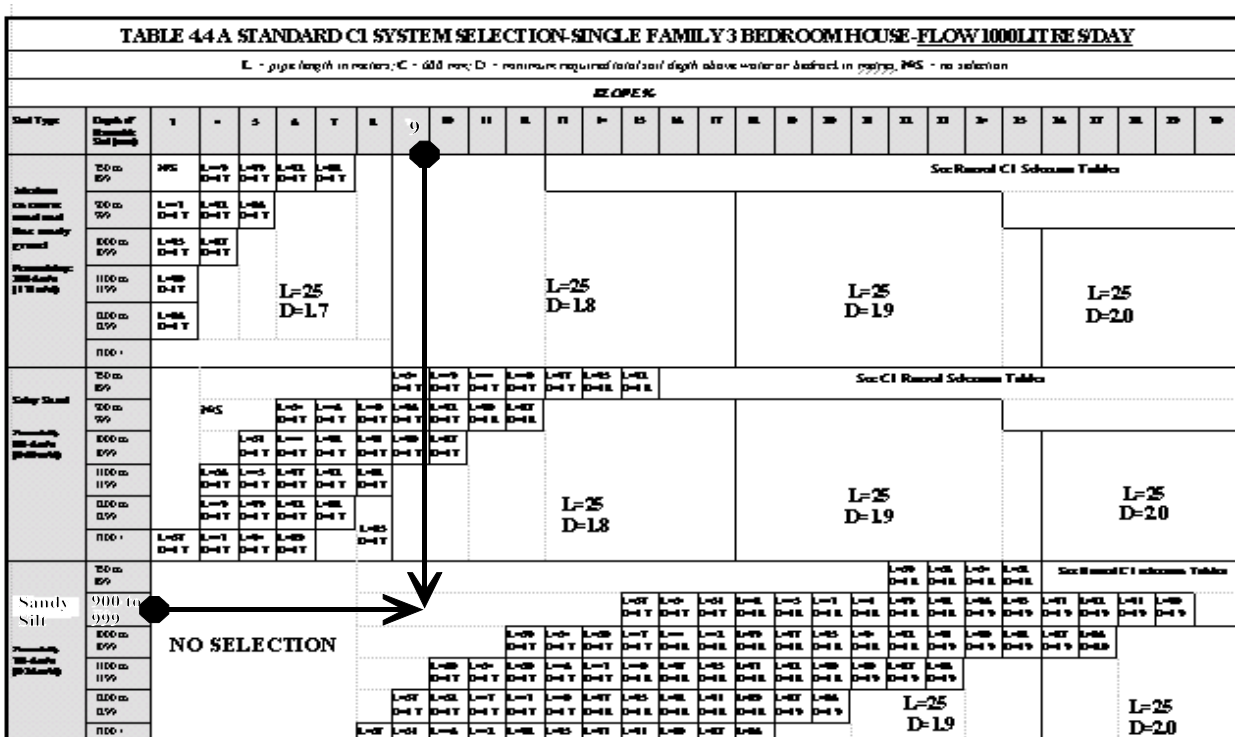
TABLE 4.2

DISPOSAL SYSTEM SELECTION OPTIONS

* *Not all options provided are suitable for each property being assessed, separation distances to water table and bedrock etc must be taken into consideration.*

Permeable Soil Depth (mm)	Slope less than 3 %	Slope of 3 % or greater and less than 30 %	Slope over 30 %
0 to less than 300	Mound	C2(r), C3	**Not Acceptable For Selection. Design Only By A Level 1 Qualified Person**
300 to less than 600	Mound	C2,C2(r), C3	
600 to less than 750	Mound	C2,C2(r), C3	
750 to over 1300	Mound	C1, C1(r), C2, C2(r), C3	
780 and over	Area Bed		
875 and over	Multiple Trench		

After the decision has been made to select C1 type disposal bed, we select length of the system from tables in **Appendix J**, as shown in the example below. First we use **Table 4.4A** to see if a standard C1 can be selected.



A standard (fully trenched C1) can not be selected for the site conditions described in this example. Next we try to select a Raised C1 from the **Table 4.5A** as shown below:

TABLE 4.5A RAISED C1 SYSTEM SELECTION - SINGLE FAMILY 3 BEDROOM HOUSE - FLO

L= pipe length in metres; C= 300 mm; D= minimum required total soil depth above water or bedrock in metres; N/S= no selecti

SLOPE %

Soil Type	Depth of Permeable Soil (mm)	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Medium to coarse sand and fine sandy gravel Permeability: 20E-6 m/s (1.73 m/d)	750 to 899	L=32 D=1.4																	
	900 to 999	L=26 D=1.4																	
	1000 to 1300 +	L=25 D=1.4						L=25 D=1.5											
Silty Sand Permeability: 8E-6 m/s (0.69 m/d)	750 to 899	N/S		L=49 D=1.4	L=40 D=1.4	L=35 D=1.4	L=30 D=1.4	L=27 D=1.4											
	900 to 999		L=49 D=1.4	L=39 D=1.4	L=32 D=1.4	L=28 D=1.4													
	1000 to 1099	L=57 D=1.4	L=43 D=1.4	L=34 D=1.4	L=29 D=1.4														
	1100 to 1199	L=51 D=1.4	L=38 D=1.4	L=31 D=1.4	L=26 D=1.4	L=25 D=1.4		L=25 D=1.5											
	1200 to 1299	L=46 D=1.4	L=35 D=1.4	L=28 D=1.4															
	1300 +	L=42 D=1.4	L=32 D=1.4																
Sandy Silt Permeability: 3E-6 m/s (0.26 m/d)	750 to 899									L=59 D=1.4	L=54 D=1.4	L=50 D=1.4	L=46 D=1.4	L=43 D=1.5	L=40 D=1,5	L=38 D=1.5	L=36 D=1.5	L=34 D=1.5	L= D=
	900 to 999							L=57 D=1.4	L=52 D=1.4	L= 47 D=1.4	L= 43 D=1.4	L= 40 D=1.4	L= 37 D=1.5	L=35 D=1.5	L=32 D=1.5	L=31 D=1.5	L=29 D=1.5	L=27 D=1.6	L= D=
	1000 to 1099	No Selection					L=57 D=1.4	L=51 D=1.4	L=46 D=1.4	L=42 D=1.4	L=38 D=1.4	L=35 D=1.5	L=33 D=1.5	L=31 D=1.5	L=29 D=1..5	L=27 D=1.5	L=26 D=1.6		

Table 4.5A shows the following system parameters for the selection criteria indicated below.

(Selection Criteria: Flow - 1000 l ; Soil - 990 mm of sandy silt.; Slope 9%)

L(total system length) = **57 meters** (*Note: should the width of the lot permit it is advisable to install system as long as possible)*
C(front cut) = **0.3 meter**
D(minimum required soil depth above water, bedrock etc) = **1.4 meter**, since calculated depth to groundwater is 1690 mm (1.69 m) a **raised C1** system can be installed on this lot.

After selecting disposal bed length (L), the **width** (**W**)of the disposal bed should be selected from **Table 4.12** of the Guidelines, as shown below.
The selected width for 57 m long system is:

W(width) = 0.6 m

TABLE 4.12

Determination of Disposal Trench Widths in Metres For C1, C2, C3 and Mound Systems

Length of Trench (m)	Flow (litres per day)		
	1000	1350 (C3/Mound Only)	1500
	Width in M	Width in M	Width in M
25	1.2	N/A	1.8
26	1.2	N/A	1.7
27	1.1	N/A	1.7
28	1.1	N/A	1.6
29	1.0	N/A	1.6
30, 31	1.0	N/A	1.5
32, 33, 34	0.9	1.2	1.4
35, 36	0.9	N/A	1.3
37, 38, 39	0.8	N/A	1.2
40	0.8	N/A	1.1
41, 42, 43	0.7	N/A	1.1
44, 45, 46	0.7	N/A	1.0
47	0.6	N/A	1.0
48 - 52	0.6	N/A	0.9
53 - 60	0.6	N/A	0.8

Next we have to select septic tank size from table 3.1 of the Guidelines.
For three bedroom house assumed in this example minimum required volume of the septic tank is :

V = 2800l (*Note: should a home owner wish to install a garbage grinder capacity of the tank should be increased by 20% i.e volume would increase to 1.2*2800 = 3,360 l.)*

After all the parameters of the disposal bed have been selected, sketch of the cross section should be prepared indicating all pertinent dimensions and specifications. A standard cross sections shown in Appendix H can be used for that purpose. To complete the process, a sketch of the proposed lot lay out should be prepared and Application to install disposal system completed and signed. (See example below)

When preparing lot lay out remember to indicate location of all buildings, wells on design and adjacent properties (including type), watercourses, water resources, bedrock outcrops, driveway and other features that may influence the selection or design of the system on the lot or **within 60 meters of any part of the proposed system** including a sketch of proposed on-site sewage disposal system selection/design. **The test pit and proposed system location must be shown in reference to two fixed points on the property and be within 6 meters plus or minus of the system location**. **The placement of the system must at all times meet the minimum clearance distances in the regulations unless a variance is specified in the terms and conditions of the Approval**. If this application is for the replacement of a malfunctioning system; show the location of the existing system. (Refer to Appendix H - Submission Standards for Applications).

SUBMISSION STANDARD

All applications must comply with the Act, Regulations, Guidelines and any policies within the Department. A completed copy of this form must accompany each application.

APPLICANTS NAME: John T Doe **APPLICATION #:** _____

SUBDIVISION NAME: Nice Place Estates **LOT NUMBER:** 100

SOIL EVALUATION TESTS

TEST PIT PROFILE (M) **Evaluation Date:** July 5, 2007

			SOIL STRATUM	SOIL TYPE	DEPTH OF SOIL (mm)	DENSITY	MOISTURE
TOTAL DEPTH:	1.89	m					
BEDROCK AT:	over 1.69	m	**ORGANIC**	organic mat	100	n/a	dry
WATER TABLE:	1.69	m	**1st layer**	Silty Sand	200	loose	dry
SLOPE:	9	%	**2nd layer**	Sandy Silt	790	loose	dry
ROOTS TO:	0.5	m	**3rd layer**	Clay	600	dense	moist
MOTTLING AT:	No Mottling	m	**4th layer**	Silty Sand	200	loose	saturated

SYSTEM SELECTION CRITERIA

Daily flow	Permeable soil type	Depth of permeable soil	Slope	Soil permeability (In-situ test)
litres/day: 1000	Sandy Silt	mm: 990	%: 9	m/s: _____

SYSTEM SELECTION FROM TECHNICAL GUIDELINES

Type of Disposal Field:	C1 Raised	**Imported sand fill required**	❒ YES ☒ NO
Distribution Trench Dimensions:	Length: 57 m Width: 0.6 m	**Permeability Rate**	n/a m/sec
Cut at Toe of Trench:	300 mm	**Width of Buffer** - downslope - upslope	n/a m n/a m
Interceptor Trench Liner:	☒ YES ❒ NO depth: 1200 mm ☒ YES ❒ NO thickness: 20 mils	**Depth of Buffer** (at 5 m from trench)	n/a mm
Pump or Siphon Capacity Watertight Testing:	n/a litres ❒ YES ❒ NO	**Septic Tank Capacity** Watertight Testing:	2800 litres ☒ YES ❒ NO

Actual Clearance Distances**

From Nearest	To System	To Tanks*	From Nearest	To System	To Tanks*	From Nearest	To System	To Tanks*
Lot Boundary	7 m	25 m	**Cistern**	N/A m	N/A m	**Water Distribution**	N/A m	N/A m
Downslope Boundary	10 m	15 m	**Watercourse**	54 m	>60 m	**Foundation Drain**	7 m	2 m
Drilled Well	20 m	30.4 m	**Wetland**	N/A m	N/A m	**Other**	N/A m	N/A m
Dug Well	35 m	31 m	**Intermittent Drain**	16 m	26 m	**Other**	N/A m	N/A m

* The shortest distance from any of the following: septic tank, pump or siphon chamber and effluent pipe

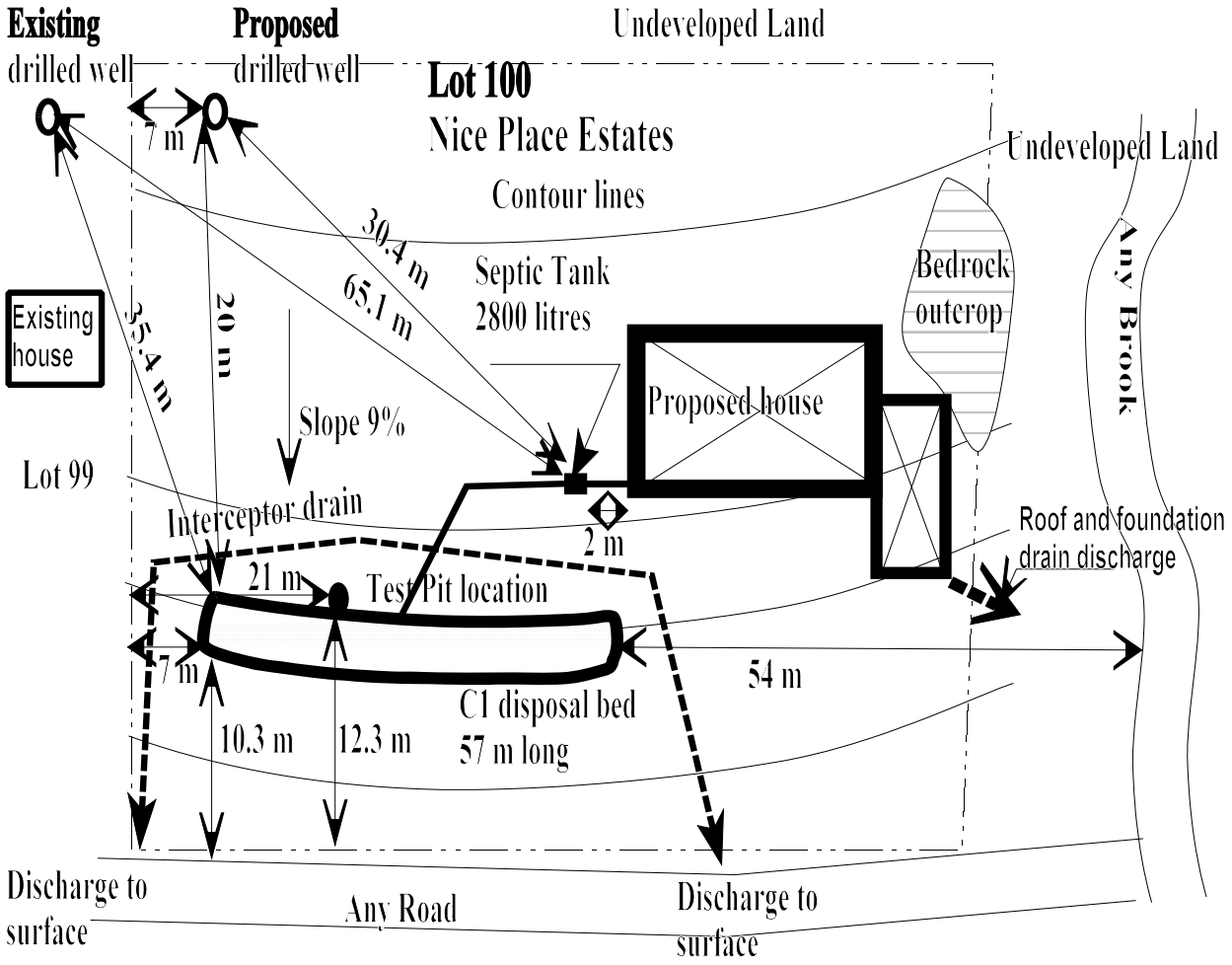
** Enter actual distance, or N/A or > 60 meters

SUBMISSION STANDARD

All applications must comply with the Act, Regulations, Guidelines and any policies within the Department. A completed copy of this form must accompany each application. (A separate sketch or drawing may be utilized provided it includes the requested information).

SITE EVALUATION OF LOT/ PROPOSED SYSTEM

Sketch of lot, showing location of soil evaluation test pits, direction of slope, watercourse and other features that may influence the selection or design of the system on the lot or **within 60 meters of any part of the proposed system** including a sketch of proposed On-site Sewage Disposal System Selection/Design*. **The test pit location is shown in reference to two fixed points on the property and is within 6 meters of the disposal field location**. **The placement of the system must at all times meet the minimum clearance distances in the regulations unless a variance is specified in the terms and conditions of the Approval**. If this application is for the replacement of a malfunctioning system; show the location of the existing system.



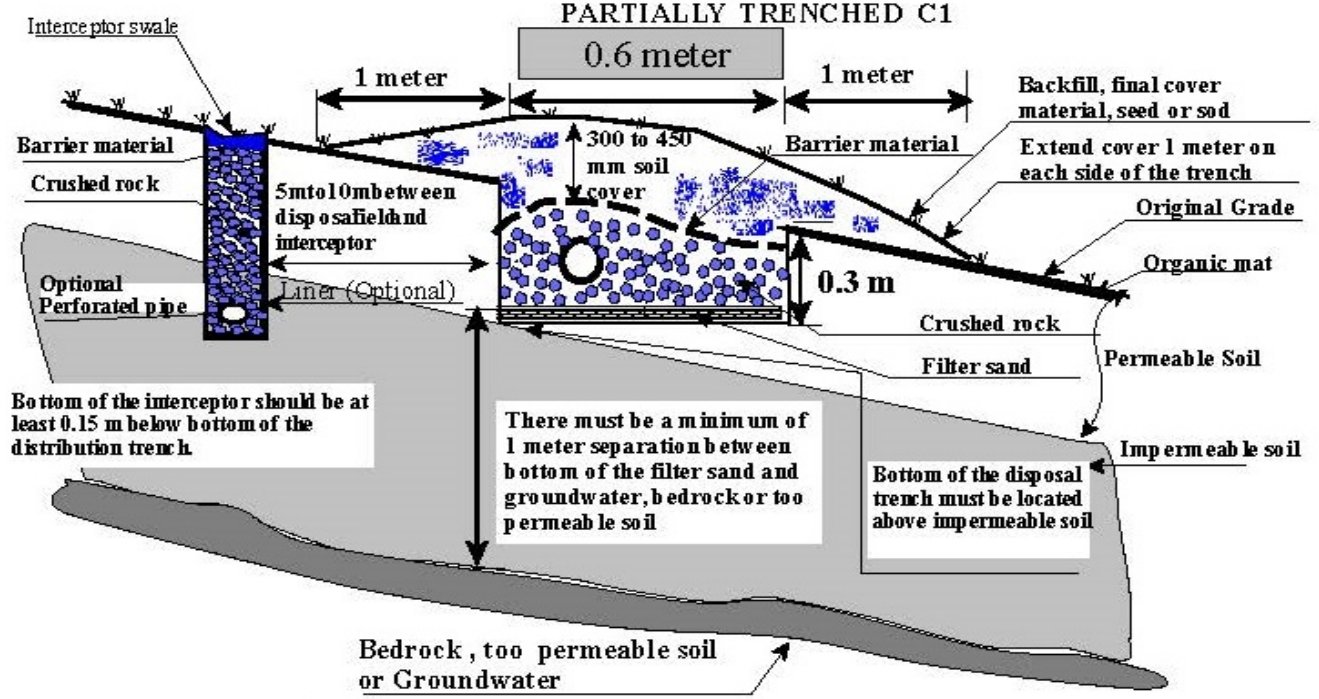
* Cross sectional diagrams of proposal to be attached to this form for submission.

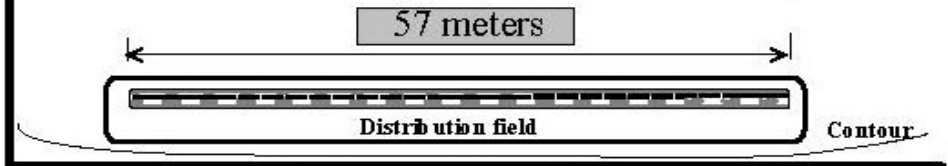
DATE: *July 21, 2007* **QUALIFIED PERSON**: *John Qualified*
(SIGNATURE)

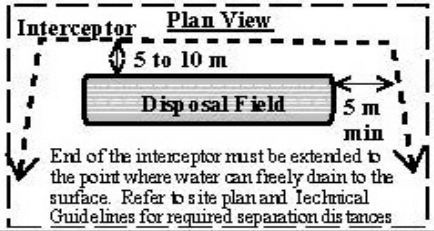
CERTIFICATE OF QUALIFICATION/APENS #: *123* John Qualified
(PRINT NAME)

SCHEDULE C

PARTIALLY TRENCHED C1







General Conditions

Contractor shall verify location of all wells, watercourses, lot boundaries and all elevations prior to construction (within 30.5 m from the location of disposal system)

Backwash water from water treatment devices must not be discharged to the on-site sewage disposal system unless the system is designed by a professional engineer.

Roof, foundation and lot drainage must be directed away from the disposal field, septic tank and pump (siphon) chamber.

Steps must be taken to ensure that the proposed disposal field area is not subject to vehicular traffic or any other disturbance such as excavation or stockpilling of excavated material etc., Installation of physical barrier is recommended.

It is the applicants responsibility to assure that the construction of foundations, driveway, well or any other development on the lot will not impact on the feasibility of on site sewage disposal field installation.

Disposal System must be installed by a contractor licensed to install on-site sewage disposal systems in Nova Scotia.

All work must be completed in accordance with the Nova Scotia On-Site Sewage Disposal Systems Regulations , On-Site Sewage Systems Technical Guidelines , and conditions of the Approval.

DISPOSAL FIELD REQUIREMENTS							
100	mm	Final cover material, seed or sod					
200 to 350	mm	Clean local permeable backfill					
Required over crushed rock		Barrier material					
75	mm	Crusher rock above pipe					
100	mm	Perforated pipe diameter					
57	m	Perforated pipe diameter					
125	mm	Crushed rock below pipe					
75	mm	Filter sand	Permeability m/s	1e-4 to 5e-4	Minutes at 20°C	2-10	
1.2	m	Interceptor/Swale depth			Liner	Yes X	No

Selection Criteria:		NOT TO SCALE
Flow (l/d):	1000	Applicant: John Doe
Slope (%):	9	Approval No.:
Soil type:	Silty Sand	Location: Nice Place Estates
Soil depth (mm):	990	Qualified Person: John Qualified

C2 SELECTION EXAMPLE

Disposal System Selection Example
C2 System Selection

Site conditions:

- Slope 7%
- Test pit data:

Organic Mat	- 100 mm	- t*his is not a permeable soil*
Sandy Silt	- 300 mm ,loose, brown	- *permeable soil*
Silty Sand	- 200 mm, loose ,brown ,dry	- *permeable soil*
Clay	- 700 mm, dense, moist	- *not (or slow) permeable*
Silty Sand	- 200 mm, loose, saturated	- *permeable but saturated, not usable for disposal field installation*

Water at 50 mm from test pit bottom and rising
Roots penetration approximately 500 mm

Project: 3 bedroom single family home (Flow = 1000L/Day)

SELECTION:

1. Calculate total soil depth
   - 300 +200 + 700 + 200 = **1400 mm** (organic mat not included)
2. Calculate permeable soil depth
   - 300 + 200 = **500 mm** (organic mat, clay and saturated sandy silt are not included)
3. Calculate depth to groundwater
   - 300 + 200 + 700 = **1200 mm** (Saturated silty sand is assumed to represent ground water level.
4. Although the permeable soil consist of two different soil types (sandy silt and silty sand), the one with lower permeability (sandy silt) will be used to make system selection. In this example we will assume that we have 500 mm of sandy silt.

Selection Criteria: Flow - 1000 l ; Soil - 500 mm of sandy silt.; Slope 7%

Table 4.2 indicates a following selection choices for the lot described in this example : C2, C2(r) ,C3. Since the cost of the system increases with the amount of imported sand fill required for its construction the most economic choice will be a C2 type sewage disposal system.

TABLE 4.2

DISPOSAL SYSTEM SELECTION OPTIONS

* *Not all options provided are suitable for each property being assessed, separation distances to water table and bedrock etc must be taken into consideration.*

Permeable Soil Depth (mm)	Slope less than 3 %	Slope of 3 % or greater and less than 30 %	Slope over 30 %
0 to less than 300	Mound	C2(r), C3	**Not Acceptable For Selection. Design Only By A Level 1 Qualified Person**
300 to less than 600	Mound	C2,C2(r), C3	
600 to less than 750	Mound	C2,C2(r), C3	
750 to over 1300	Mound	C1, C1(r), C2, C2(r), C3	
780 and over	Area Bed		
875 and over	Multiple Trench		

After the decision has been made to select a C2 type disposal field; first check if a standard C2 disposal field can be utilized (Table 4.6A). For this soil type, depth and slope, there is **no selection** available for a standard C2. Since a standard C2 cannot be utilized, the next step is to check table 4.7A for selection of a raised C2. Select length of the system from table 4.7A as shown in the example below.

TABLE 4.7A (IMPORTED SAND FILL, 3x10^{-5} m/s to 5x10^{-4}m/s) RAISED C2 SYSTEM SELECTION - SINGLE FAM

L = pipe length in meters; C = 100 mm; **D** *= minimum required total soil depth above water or bedrock*

Soil Type	Depth of Permeable Soil (mm)	SLOPE % 3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Medium to coarse sand and fine sandy gravel Permeability: 20E-6 m/s (1.73 m/d)	150 to 299	N/S	L=49 D=1.0	L=39 D=1.0	L=33 D=1.0						L=33 D=1.1								
	300 to 599	L=43 D-1.0																	
	600 +	L=26 D=1.0	L=25 D=1.0					L=25 D=1.1									L=25		
Silty Sand Permeability: 8E-6 m/s (0.69 m/d)	150 to 299	N/S		L=55 D=1.0	L=46 D=1.0	L=40 D=1.0	L=35 D=1.0	L=33 D=1.0			L=33 D=1.1								
	300 to 449		L=54 D=1.0	L=43 D=1.0	L=36 D=1.0														
	450 to 599	L=59 D=1.0	L=44 D=1.0	L=35 D=1.0															
	600 to 749	L=50 D=1.0	L=37 D=1.0	L=30 D=1.0	L=25 D=1.0			L=25 D=1.1											
	750 to 899	L=43 D=1.0	L=32 D=1.0	L=26 D=1.0															
	900 to 999	L=38 D=1.0	L=29 D=1.0																
	1000 to 1099	L=35 D=1.0	L=27 D=1.0																
	1100 to 1199	L=33 D=1.0																	
	1200 +	L=31 D=1.0																	
Sandy Silt Permeability: 3E-6 m/s	150 to 299	N/S			L=56 D=1.0	L=48 D=1.0	L=42 D=1.0	L=38 D=1.0	L=34 D=1.1	L=33 D=1.0	L=33 D=1.1								
	300 to449			L=60 D=1.0	L=50 D-1.0	L=43 D=1.0	L=38 D=1.0	L=33 D=1.0											
	450 to 599			L=54 D=1.0	L=45 D=1.0	L=38 D=1.0	L=34 D=1.0												

Table 4.7A shows following system parameters for the selection criteria indicated below.

(Selection Criteria: Flow - 1000 l ; Soil - 500 mm of sandy silt.; Slope 7%)

L(total system length) = **38 meters** (*Note: should the width of the lot permit it is advisable to install system as long as possible)*

D(minimum required soil depth above water, bedrock etc) = **1.0 meter**, since calculated depth to groundwater is 1200mm (1.2 m) a **C2** system can be installed on this lot.

If the calculated depth to groundwater, bedrock or unacceptably high permeable soil (step 3 above) is not equal to or greater than the D required in table 4.7A (1.0 m in this example); a C2 **cannot** be used and a C3 will have to be selected.

After selecting disposal field length (L), the **width** of the disposal trench should be selected from table 4.12 of the Guidelines (see page E-3 for an example of the use of table 4.12).

The selected width for 38 m long system is:

$W_{(width)}$ = 0.8 m

Next we have to select septic tank size from table 3.1 of the Guidelines.
For three bedroom house assumed in this example minimum required volume of the septic tank is :

V = 2800l (*Note: should a home owner wish to install a garbage grinder capacity of the tank should be increased by 20% i.e volume would increase to 1.2*2800 = 3,360 l.)*

After all the parameters of the disposal field have been selected, a sketch of the cross section should be prepared indicating all pertinent dimensions and specifications. The standard cross sections shown in Appendix H can be used for that purpose. To complete the process a sketch of the proposed lot lay out should be prepared and the Application to install the on-site sewage disposal system completed and signed. (See example of completed forms in the C1 selection example)

When preparing the lot lay out remember to indicate location of all buildings, wells on this lot and all adjacent properties (including type of well), watercourses, water resources, bedrock outcrops, driveway and other features that may influence the selection or design of the system on the lot or **within 60 meters of any part of the proposed system** including a sketch of proposed on-site sewage disposal system selection/design. **The test pit and proposed system location must be shown in reference to two fixed points on the property and be within 6 meters plus or minus of the system location**. **The placement of the system must at all times meet the minimum clearance distances in the regulations unless a variance is specified in the terms and conditions of the Approval**. If this application is for the replacement of a malfunctioning system; show the location of the existing system. (Refer to Appendix H - Submission Standards for Applications).

MOUND SELECTION EXAMPLE

Disposal System Selection Example
Mound Disposal Field

Site conditions:

Test pit observations:

0 to 25 mm- Organic mat (dark brown forest litter)
25 to 750 mm- Sandy silt (reddish brown with root penetration to 350mm but no mottles)
below 750 mm- Silty clay (reddish and very compact soil, mottles give evidence that a seasonal water table could be present at the 750 mm level, no roots)
No evidence of water table or bedrock at the bottom of test pit, 1.5 m depth, but there has been no rain for three weeks and soil conditions are extremely dry.

Site inspection field notes included the following:

Lot dimensions - 50 m x 100 m (existing lot created in 1954)
Slope down slope of proposed system 2 %
Long slope up hill of proposed system - interceptor will be required
Driveway will be a concern. Line will have to cross under driveway between tank and disposal field. Also driveway cannot be located in area proposed by owner but must be kept within three metres of easterly lot line.
The only suitable location for the dug well is on upper side of house at least 30.5 metres from system
There is a consistent contour in area of proposed system where a system up to 40 m could be installed and still meet all separation distances.

Proposed development:

Four bedroom house, two bathrooms with high flow fixtures but no hot tub or garborator.

Selection Procedure:

1) Check selection options available from Table 4.2 (See C1 and C2 selection examples for use of Table 4.2)

Options include: Mound for 2 % and 725 mm sandy silt

2) Check requirements of Section 4.8 to see if a Mound will be suitable

- ❏ Flow 1500 l/day
- ❏ Slope is less than 3%
- ❏ Use table 4.9 to select the system length and the specification for the imported sand fill. Use table 4.12 to select the system width. For a flow of 1500 l/day select a **38 m** mound from table 4.9 with an imported sand fill specification of **3×10^{-5} to 5×10^{-4} m/s** and a width of **1.2 m** from table 4.12.
- ❏ Depth to water table is 750 mm below grade, once the organic layer is removed below the mound, the water table will be 725 mm below the bottom of the sand. The minimum amount of sand allowed under the bottom of the disposal trench is 600 mm. therefore the separation from the bottom of the trench to high water table will be 600 + 725 = 1325 mm. This is greater than the 1 m minimum requirement therefore use 600 mm imported sand fill under the trench.
- ❏ Select other dimensions from figure 4.G for a 38 m Mound having 600 mm imported

sand fill under the tench. An Interceptor is also required up slope from the Mound.

This Mound will fit on the lot and meet all the requirements of the regulations and guidelines. If for any reason the selector feels that a longer Mound would be more appropriate, the length should be increased.

When preparing the lot lay out remember to indicate location of all buildings, wells on this lot and all adjacent properties (including type of well), watercourses, water resources, bedrock outcrops, driveway and other features that may influence the selection or design of the system on the lot or **within 60 meters of any part of the proposed system** including a sketch of proposed on-site sewage disposal system selection/design. **The test pit and proposed system location must be shown in reference to two fixed points on the property and be within 6 meters plus or minus of the system location**. **The placement of the system must at all times meet the minimum clearance distances in the regulations unless a variance is specified in the terms and conditions of the Approval**. If this application is for the replacement of a malfunctioning system; show the location of the existing system. (Refer to Appendix H - Submission Standards for Applications).

Note: If it were not possible to select a mound for this site, no system could be selected. The only way that approval to install a system could be obtained in that case would then be if a QP1 could design a system to fit on the lot. One situation in the above example where it would not have been possible to select a system would have occurred if the available length on the lot for the mound was less than 38 m.

C3 SELECTION EXAMPLE

Disposal System Selection Example
C3 Disposal Field

Site conditions:

Test pit observations:

0 to 50 mm- Organic mat (dark brown to back)
50 to 190 mm- Sandy silt (reddish brown with root penetration but no mottles)
below 190 mm- Silty clay (reddish and very compact but no mottles and no roots)
water table in the test pit at a depth of 600 mm

Site inspection field notes included the following:

Lot dimensions - 100 m x 300 m
Slope down slope of proposed system 16%
Small brook approximately 85m down slope of proposed system-not a concern
Long slope up hill of proposed system - interceptor will be required
Keep driveway toward west boundary to avoid system
Locate dug well on upper side of house at least 30.5 metres from system
There is a consistent contour in area of proposed system where a contour system up to 100 m could be installed and still meet all separation distances.

Proposed development:

Three bedroom house, two bathrooms but no hot tub or garborator.

Selection Procedure:

1) Check selection options available from Table 4.2 (See C1 and C2 selection examples for use of Table 4.2)

Options include: C3, or C2(r) for 16% and 140 mm sandy silt

2) Check Table 4.7a to see if a C2(r) is suitable for 140 mm of sandy silt at 16%

C2(r) is suitable, however the 1 meter separation to watertable cannot be achieved.

3) Check requirements of section 4.7 to see if a C3 will be suitable

- ❏ Flow 1000l/day
- ❏ Slope is greater than 3% (16% in this example)
- ❏ Use table 4.9 to select the system length and the specification for the imported sand fill. Use table 4.12 to select the system width. For a flow of 1000 l/day select a **25 m** C3 from table 4.9 with an imported sand fill specification of **3 x 10^{-5} to 5 x 10^{-4} m/s** and a width of **1.2 m** from table 4.12.
- ❏ Separation to ground water, bedrock, or soil with unacceptable high permeability is a concern as watertable was observed at the 600 mm depth. The minimum amount of sand allowed under the bottom of the disposal trench is 600 mm.; therefore the separation from the bottom of the trench to high water table will be 600 + 600 = 1200 mm. This is greater than the 1 m minimum requirement; therefore use 600 mm imported sand fill under the trench.
- ❏ Select other dimensions from figures 4.E and 4.F to go with the 25 m C3 having 600 mm imported sand fill under the rock trench

This C3, with interceptor, will fit on the lot and meet all requirements of the Guidelines. If for any reason the selector feels that a longer C3 would be more appropriate the length should be increased.

When preparing the lot lay out remember to indicate location of all buildings, wells on this lot and all adjacent properties (including type of well), watercourses, water resources, bedrock outcrops, driveway and other features that may influence the selection or design of the system on the lot or **within 60 meters of any part of the proposed system** including a sketch of proposed on-site sewage disposal system selection/design. **The test pit and proposed system location must be shown in reference to two fixed points on the property and be within 6 meters plus or minus of the system location**. **The placement of the system must at all times meet the minimum clearance distances in the regulations unless a variance is specified in the terms and conditions of the Approval**. If this application is for the replacement of a malfunctioning system; show the location of the existing system. (Refer to Appendix H - Submission Standards for Applications).

AREA BED AND MULTIPLE TRENCH SELECTION EXAMPLE

Disposal System Selection Example
Area Bed or Multiple Trench System

Site conditions:

Test pit observations:

0 to 60 mm- Organic mat (dark brown forest litter)
60 to 700 mm- silty sand (reddish brown and loose with root penetration to 600 mm appears well drained, a few cobbles up to 100mm in diameter)
700 mm to 1500 mm- sandy silt (reddish, moderate compaction no evidence of soil mottles or water table, some rounded cobbles up to 150 mm in diameter)
No evidence of water table or bedrock to bottom of test pit, 1.5 m depth but there has been no rain for three weeks and soil conditions are extremely dry.

Site inspection field notes included the following:

Lot dimensions - 40 m x 75 m (existing lot created in 1975)
Slope down slope of proposed system 2.5%
Long slope up hill of proposed system - interceptor swale will be required.
Lot slopes away from house to rear of the lot so driveway will not be a concern however there is an existing drilled well 10 m beyond the downslope boundary System should be kept as far away as possible, at least 25 m up slope from the lot boundary .
The most suitable location for the drilled well on this lot is on the upslope side of the house at least 15.2 m from the system
Although there is little slope on the lot (2.5 %) the contour runs almost perpendicular to the 75 m lot line which leaves a distance of 40 m available along the contour for a system not counting separation distances.

Proposed development:

Three bedroom house, two bathrooms, no hot tub or garborator, no plumbing in the basement.

Selection Procedure:

Check selection options available from **Table 4.2** (See C1 and C2 selection examples for use of Table 4.2)

Options include: Area Bed, Multiple Trench, or Mound for 1.5 m permeable soil and less than 3% slope. In this example, the selector decided to see if either a multiple trench or area bed could be used and then determine which system would be most appropriate for the lot.

NOTE: If an area bed or multiple trench system can be selected, one of these systems would be the preference to a mound system as either of these systems should be less expensive and should blend into the landscape better than a mound. In most cases the conditions that allow the selection of an area bed or multiple trench system are the same and it is up to the selector to decide which system is more appropriate. The only case where an area bed can be selected and a trench system cannot be selected is when there is between 780 and 875 mm of permeable soil on the lot. In situations where a multiple trench field can be selected an area bed can always also be selected.

Follow the selection procedure outlined in section 4.9.2 for the area bed

1) Average daily flow for 3 bedroom home 1000 l/day
2) Ground slope less than 3%
3) Total depth of permeable soil = 640 mm silty sand + 850 mm sandy silt = 1490 mm. Use the least permeable soil type i.e.. sandy silt.
4) As per Table 4.11(A), this depth of permeable soil and no restrictive layers will allow a fully trenched area bed system.
5) For sandy silt and 1000 l/day; **Table 4.11(B)** requires an area bed with an area of 125 m^2 and a minimum cross slope dimension of 25 m. Site inspection notes show that up to 40 m along the slope is available, not counting separation distances. If we allow 5 m to each lot boundary (3 m is the minimum) this leaves 30 m for the bed. Therefore make the bed 30 m x 5 m.

Follow the selection procedure outlined in section 4.9.3 for the multiple trench field.

1) Average daily flow for 3 bedroom home 1000 l/day
2) Ground slope less than 3%
3) Total depth of permeable soil = 640 mm silty sand + 850 mm sandy silt = 1490 mm. Use the least permeable soil type i.e.. sandy silt.
3) As per Table 4.10(A), this depth of permeable soil and no restrictive layers will allow a fully trenched system.
4) For sandy silt and 1000 l/day; **Table 4.10(B)** requires a total of 112 m of trench with a minimum cross slope of 28 m and four trenches. Site inspection notes show that up to 40 m along the slope is available, not counting separation distances. If we allow 5 m to each lot boundary (3 m is the minimum) this leaves 30 m for the field. Therefore, extend the trench length to 30 m but still use four trenches, giving a total trench length of 120 m. The minimum trench width is 600 mm.

The selector would then decide if the use of an area bed 30 m x 5 m or a multiple trench field consisting of 4 trenches 30 m long and 0.6 m wide would be the most suitable solution for the lot. Pipe location and other details would be obtained from Section 4.9 plus the system diagrams.

When preparing the lot lay out remember to indicate location of all buildings, wells on this lot and all adjacent properties (including type of well), watercourses, water resources, bedrock outcrops, driveway and other features that may influence the selection or design of the system on the lot or **within 60 meters of any part of the proposed system** including a sketch of proposed on-site sewage disposal system selection/design. **The test pit and proposed system location must be shown in reference to two fixed points on the property and be within 6 meters plus or minus of the system location**. **The placement of the system must at all times meet the minimum clearance distances in the regulations unless a variance is specified in the terms and conditions of the Approval**. If this application is for the replacement of a malfunctioning system; show the location of the existing system. (Refer to Appendix H - Submission Standards for Applications).

This area bed or multiple trench field will fit on the lot and meet all the requirements of the regulations and guidelines. If it were not possible to select an area bed or multiple trench field for this site it may be possible to select a mound. If a mound could not be selected, the only way that approval to install a system could then be obtained would be if a QP1 could design a system to fit on the lot.