# YOUR INSPECTION REPORT

PREPARED BY:

Murray Parish

FOR THE PROPERTY AT:

[redacted]

PREPARED FOR:

[redacted]

INSPECTION DATE:

[redacted], 2016


PARISH HOME INSPECTIONS

[redacted]

416 524 2768

1-877-207-1929

parishhomeinspections.com

Info@Parishhomeinspections.com


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PARISH
HOME INSPECTIONS

January 9, 2017

Dear [redacted],

RE: [redacted]

The inspection itself and the attached report comply with the requirements of the Standards of Practice of our National Association. This document,which is included at the end of the report for your perusal, defines the scope of a home inspection.
Clients sometimes assume that a home inspection will include many things that are beyond the scope. We encourage you to read the Standards of Practice so that you clearly understand what things are included in the home inspection and report.
When estimates are given ,they are based on fair market prices and practices ,They do not include hidden items .
The report has been prepared for the exclusive use of our client. No use by third parties is intended. We will not be responsible to any parties for the contents of the report, other than the party named herein .
The report is effectively a snapshot of the house, recording the conditions on a given date and time. Home inspectors cannot predict future behavior, and as such, we cannot be responsible for things that occur after the inspection. If conditions change, we are available to revisit the property and update our report.

When viewing this report as a Pre Sale Inspection .Parish Home Inspections offers a revisit for the Buyer for a nominal fee with consent of original Client.
.
The report itself is copyrighted, and may not be used in whole or in part without our express written permission.
Again, thanks very much for choosing Parish Home Inspections to perform your home inspection. We offer a full satisfaction guarantee, and will return your fee in full if you are not satisfied .
Thank you for selecting Parish Home Inspections .

Sincerely,

Murray Parish
on behalf of
PARISH HOME INSPECTIONS

PARISH HOME INSPECTIONS
[redacted]
416 524 2768
1-877-207-1929
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Info@Parishhomeinspections.com

# INVOICE

January 9, 2017

Client: [redacted]

Report No. [redacted]
For inspection at:
[redacted]
on: [redacted] 2016

| | | |
|---|---|---|
| Home inspection | | $450.00 |
| Septic Inspection Level #1 | | $175.00 |
| | Subtotal | $625.00 |
| | HST | $81.25 |
| | Total | $706.25 |

PAID IN FULL - THANK YOU!

PARISH HOME INSPECTIONS
[redacted]
416 524 2768
1-877-207-1929
parishhomeinspections.com
Info@Parishhomeinspections.com

# AGREEMENT

[redacted], 2016

Report No. 2350

parishhomeinspections.com

PARTIES TO THE AGREEMENT

**Company**
PARISH HOME INSPECTIONS
14845-6 YONGE STREET, Suite 135
Aurora, ON L4G 6H8

**Client**
[redacted]

This is an agreement between [redacted] and PARISH HOME INSPECTIONS.

PLEASE READ CAREFULLY BEFORE SIGNING.

The Inspection of this property is subject to the Limitations and Conditions set out in this Agreement. It is based on a visual examination of the readily accessible features of the building. The Inspection is performed in accordance with the Standards of Practice of our National Association. A copy of these Standards is available at http://www.oahi.com/english/about/standards-of-practice.html .
The Home Inspector's report is an opinion of the present condition of the property. The Inspection and report are not a guarantee, warranty or an insurance policy with regards to the property.
The inspection report is for the exclusive use of the client named above. No use of the information by any other party is intended.

LIMITATIONS AND CONDITIONS OF THE HOME INSPECTION

These Limitations and Conditions explain the scope of your Home Inspection. Please read them carefully before signing this Agreement.

The purpose of your Home Inspection is to evaluate the general condition of a property. This includes determining whether systems are still performing their intended functions.

There are limitations to the scope of this Inspection. It provides a general overview of the more obvious repairs that may be needed. It is not intended to be an exhaustive list. The ultimate decision of what to repair or replace is yours. One homeowner may decide that certain conditions require repair or replacement, while another will not.

1. The Home Inspection provides you with a basic overview of the condition of the property. Because your Home Inspector has only a limited amount of time to go through the property, the Inspection is not technically exhaustive. If you have concerns about any of the conditions noted, please consult the text that is referenced in the report.
Some conditions noted, such as foundation cracks or other signs of settling in a house, may either be cosmetic or may indicate a potential structural problem that is beyond the scope of the Home Inspection.
If you are concerned about any conditions noted in the report, we strongly recommend that you consult a qualified licensed contractor or engineering specialist. These professionals can provide a more detailed analysis of any conditions noted in the report at an additional cost.

2. A Home Inspection does not include identifying defects that are hidden behind walls, floors or ceilings. This includes wiring, structure, plumbing and insulation that is hidden or inaccessible.
Some intermittent conditions may not be obvious on a Home Inspection because they only happen under certain circumstances. As an example, your Home Inspector may not discover leaks that occur only during certain weather conditions or when a specific tap or appliance is being used in everyday life.

Home Inspectors will not find conditions that may only be visible when storage or furniture is moved. Inspectors do not remove wall coverings, including wallpaper, or lift flooring, including carpet to look underneath.
A Home Inspection is a sampling exercise with respect to house components that are numerous, such as bricks, windows and electrical receptacles. As a result, some conditions that are visible may go un-reported.

3. The Inspection does not include hazardous materials that may be in or behind the walls, floors or ceilings of the property, whether visible or not. This includes building materials that are now suspected of posing a risk to health such as phenol-formaldehyde and urea-formaldehyde based products, fiberglass insulation and vermiculite insulation. The Inspector does not identify asbestos roofing, siding, wall, ceiling or floor finishes, insulation or fire proofing. We do not look for lead or other toxic metals in such things as pipes, paint or window coverings.
The Inspection does not deal with environmental hazards such as the past use of insecticides, fungicides, herbicides or pesticides. The Inspector does not look for, or comment on, the past use of chemical termite treatments in or around the property.

4. We are not responsible for and do not comment on the quality of air in a building. The Inspector does not try to determine if there are irritants, pollutants, contaminants, or toxic materials in or around the building. The Inspection does not include spores, fungus, mold or mildew including that which may be concealed behind walls or under floors, for example. You should note that whenever there is water damage, there is a possibility that visible or concealed mold or mildew may be present unseen behind a wall, floor or ceiling.
If anyone in the home suffers from allergies or heightened sensitivity to quality of air, we strongly recommend that you consult a qualified Environmental Consultant who can test for toxic materials, mold and allergens.

5. Your Home Inspector does not look for, and is not responsible for, fuel oil, septic or gasoline tanks that may be buried on the property.
If fuel oil or other storage tanks remain on the property, you may be responsible for their removal and the safe disposal of any contaminated soil. If you suspect there is a buried tank, we strongly recommend that you retain a qualified Environmental Consultant to determine whether this is a potential problem.

6. We will have no liability for any claim or complaint if conditions have been disturbed, altered, repaired, replaced, or otherwise changed before we have had a reasonable period of time to investigate.

SEPTIC System

The Inspector's report is an opinion of the present condition of the Septic System. The Inspection and report are not a guarantee, warranty or an insurance policy with regards to the property.
The inspection report is for the exclusive use of the client named above. No use of the information by any other party is intended.
LIMITATIONS AND CONDITIONS OF THE Septic INSPECTION
These Limitations and Conditions explain the scope of your Septic Inspection. Please read them carefully before signing this Agreement.
The purpose of your Septic Inspection is to evaluate the general condition of a the Septic System. This includes determining whether systems are still performing their intended functions.
There are limitations to the scope of this Inspection. It provides a general overview of the more obvious repairs that may

# AGREEMENT

[redacted], 2016

be needed. It is not intended to be an exhaustive list. The ultimate decision of what to repair or replace is yours. One homeowner may decide that certain conditions require repair or replacement, while another will not.

1. The Septic Inspection provides you with a basic overview of the condition of the System. The Inspection is not technically exhaustive. If you have concerns about any of the conditions noted, please consult the text that is referenced in the report.
2. A Septic Inspection does not include identifying defects that are hidden Below ground. This includes wiring, structure and plumbing that is hidden or inaccessible.Some intermittent conditions may not be obvious on a Septic Inspection because they only happen under certain circumstances. As an example, your Home Inspector may not discover faults that occur only during certain weather conditions or when a specific taps or appliance is being used in everyday life.
3. We will have no liability for any claim or complaint if conditions have been disturbed, altered, repaired, replaced, or otherwise changed before we have had a reasonable period of time to investigate.

If you are concerned about any conditions noted in the report, we strongly recommend that you consult a qualified licensed contractor or engineering specialist. These professionals can provide a more detailed analysis of any conditions noted in the report at an additional cost.

The liability of the Home Inspector & Parish Home Inspections arising out of this Inspection and Report, for any cause of action whatsoever, whether in contract or in negligence, is limited to a refund of the fees that you have been charged for this inspection, or $1,000.00, whichever is greater and a term of 5 years from todays date.

**I, [redacted] (Signature)_____, (Date)_____, have read, understood and accepted the terms of this agreement.**

# SUMMARY

[redacted], 2016



**Note:** For the purpose of this report the building is considered to be facing **North**.

The Summary .
This section is provided as a courtesy and cannot be considered a substitute for reading the entire report. Please read the complete document.

The deficiencies listed below and the components related to these should be further evaluated and repaired by a licensed contractor or professional. This will allow a specialist to fully evaluate the system and components, and identify issues beyond our scope of work.

There are some important things you should do when taking possession of a home. These are detailed in the Priority Maintenance document, which you can access by clicking on the link below.

Priority Maintenance Items

This concludes the Summary section.

The remainder of the report describes each of the home's systems and also details any recommendations we have for improvements. Limitations that restricted our inspection are included as well.

The suggested time frames for completing recommendations are based on the limited information available during a pre-purchase home inspection. These may have to be adjusted based on the findings of specialists.

Home Improvement - ballpark costs

## Description

**Sloped roofing material:** • Shingles

**Probability of leakage:** • Not Determined

## Limitations

**Roof inspection limited/prevented by:** • Snow/ice/frost

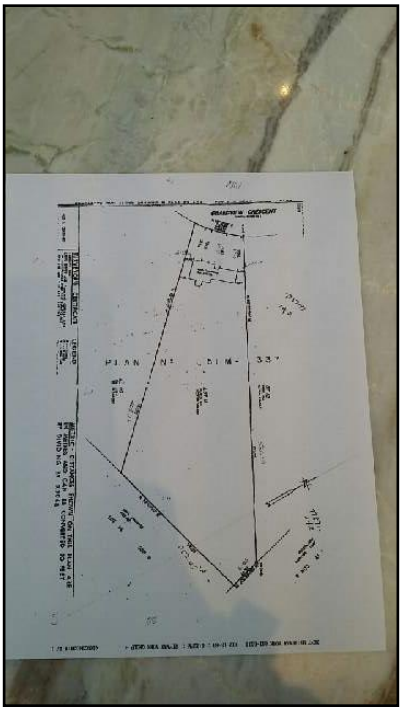
## Recommendations

**RECOMMENDATIONS \ Overview**

**1. Condition:** • Suggest too Inspect Roof when free of snow and ice
**Implication(s)**: Roof covering not inspected
**Location**: Roof
**Task**: Further evaluation
**Time**: Spring

## Description

**General:** • Lot Plan



**General:** • Rear View

*Rear View*

**Gutter & downspout material:** • Metal

**Downspout discharge:** • Above grade

**Lot slope:** • Away from building • Towards building

**Wall surfaces - masonry:** • Brick

**Soffit and fascia:** • Metal

**Driveway:** • Asphalt

**Walkway:** • Pavers

**Porch:** • Concrete

**Exterior steps:** • Pavers

**Garage:** • Attached

## Limitations

**Inspection limited/prevented by:** • Snow

**Exterior inspected from:** • Ground level

## Recommendations

**RECOMMENDATIONS \ Overview**

**2. Condition:** • Pergola Material Deterioration
**Implication(s)**: Chance of collaspe,Chance of Injury
**Location**: South Yard
**Task**: Repair
**Time**: Regular maintenance
**Cost**: $500 - and up

**WALLS \ Flashings and caulking**

**3. Condition:** • Caulking missing or ineffective
**Implication(s)**: Chance of water damage to contents, finishes and/or structure
**Location**: Various Exterior Wall Openings
**Task**: Repair
**Time**: Immediate
**Cost**: $500 - and up

*Caulking missing or ineffective*

**PORCHES, DECKS, STEPS, PATIOS AND BALCONIES \ Joists**

**4. Condition:** • Fastener problems

**Implication(s)**: Chance of movement | Weakened structure

**Location**: South Deck Stairs

**Task**: Improve

**Time**: Immediate

**Cost**: $500 - and up

*Fastener problems*


*Fastener problems*

**PORCHES, DECKS, STEPS, PATIOS AND BALCONIES \ Handrails and guards**

**5. Condition:** • Missing

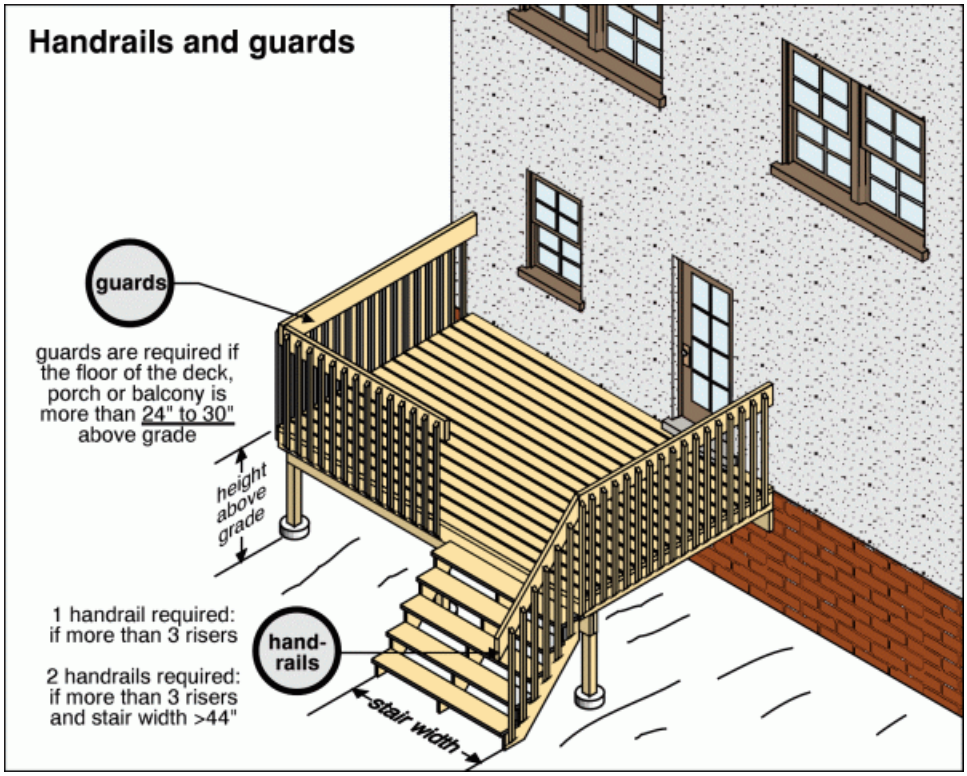
**Implication(s)**: Fall hazard

**Location**: South Stairs

**Task**: Provide

**Time**: Immediate

**Cost**: $500.00 and up




*Missing*

**LANDSCAPING \ Lot grading**

**6. Condition:** • Improper slope

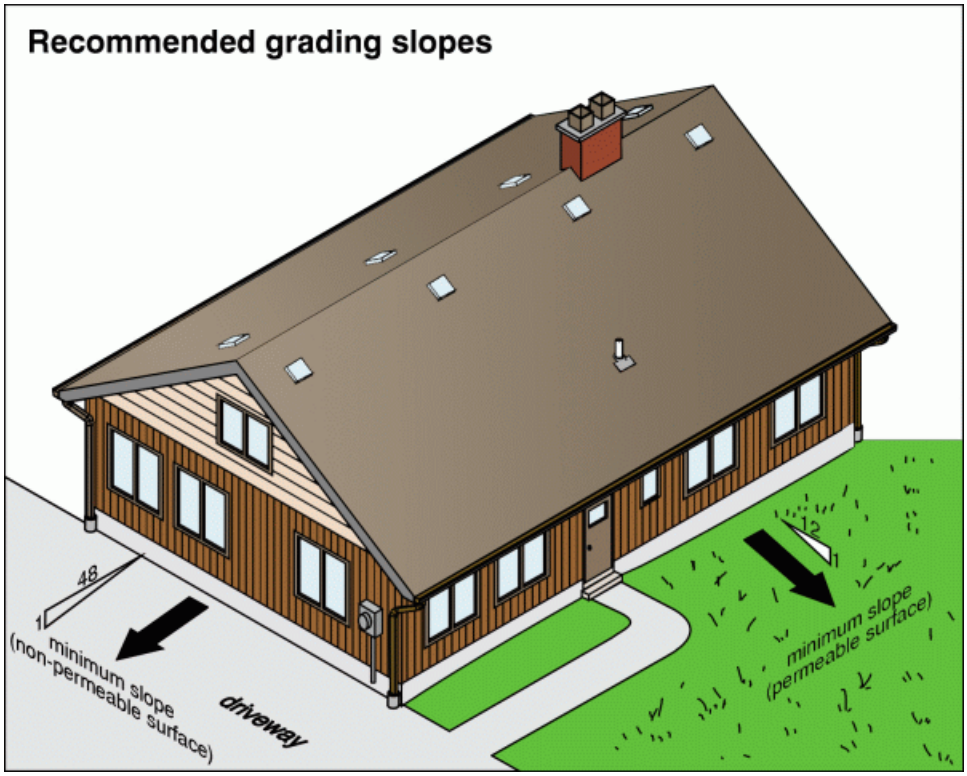
**Implication(s)**: Chance of water damage to contents, finishes and/or structure

**Location**: South Exterior Wall

**Task**: Improve

**Time**: Regular maintenance

**Cost**: Will be completed with retaining wall repairs




*Improper slope*

**LANDSCAPING \ Retaining wall**

**7. Condition:** • Leaning

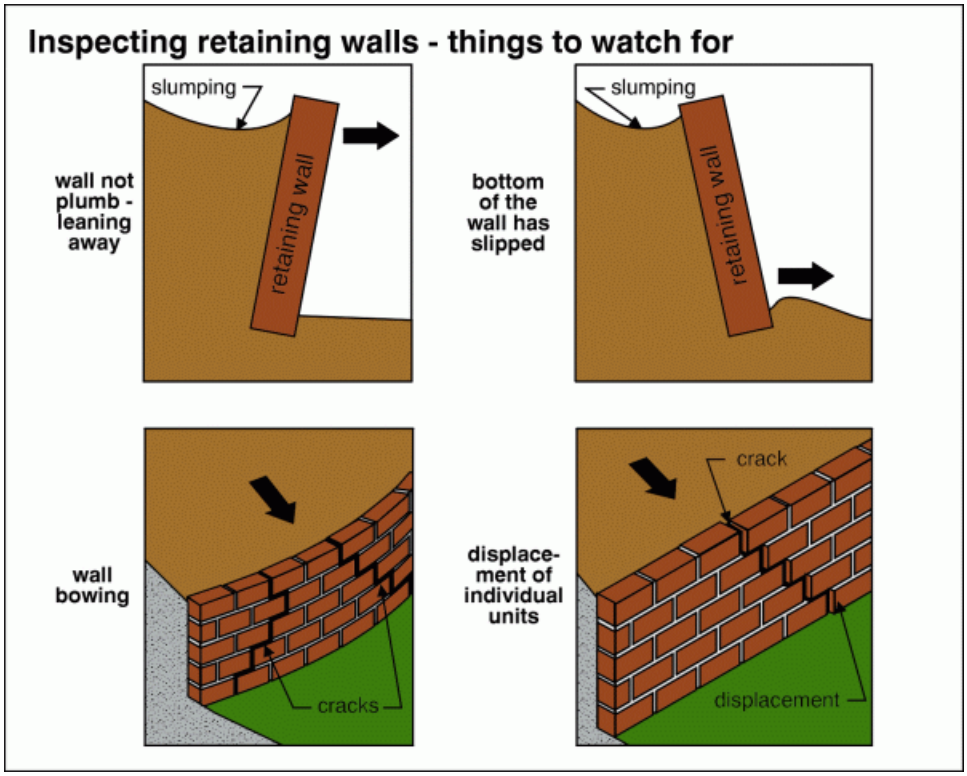
**Implication(s)**: Chance of movement | Weakened structure

**Location**: South Exterior

**Task**: Repair

**Time**: Immediate

**Cost**: $500.00 - and up




*Leaning*

**8. Condition:** • Leaning
**Implication(s)**: Chance of movement | Weakened structure
**Location**: South Yard
**Task**: Repair
**Time**: Immediate
**Cost**: $1,000 - and up

*Leaning*

*Leaning*

*Leaning*

## Description

**Configuration:**

• Basement

Walkout

**Foundation material:** • Poured concrete

**Floor construction:** • Joists • Not visible • Subfloor - plywood

**Exterior wall construction:** • Wood frame, brick veneer

**Roof and ceiling framing:**

• Trusses

*Trusses*

• Plywood sheathing

## Limitations

**Inspection limited/prevented by:** • Finished Basement • Exterior Below Grade • Snow

**Attic/roof space:** • Inspected from access hatch

**Percent of foundation not visible:** • 95 %

## Recommendations

**FOUNDATIONS \ Foundation**

**9. Condition:** • Cracked

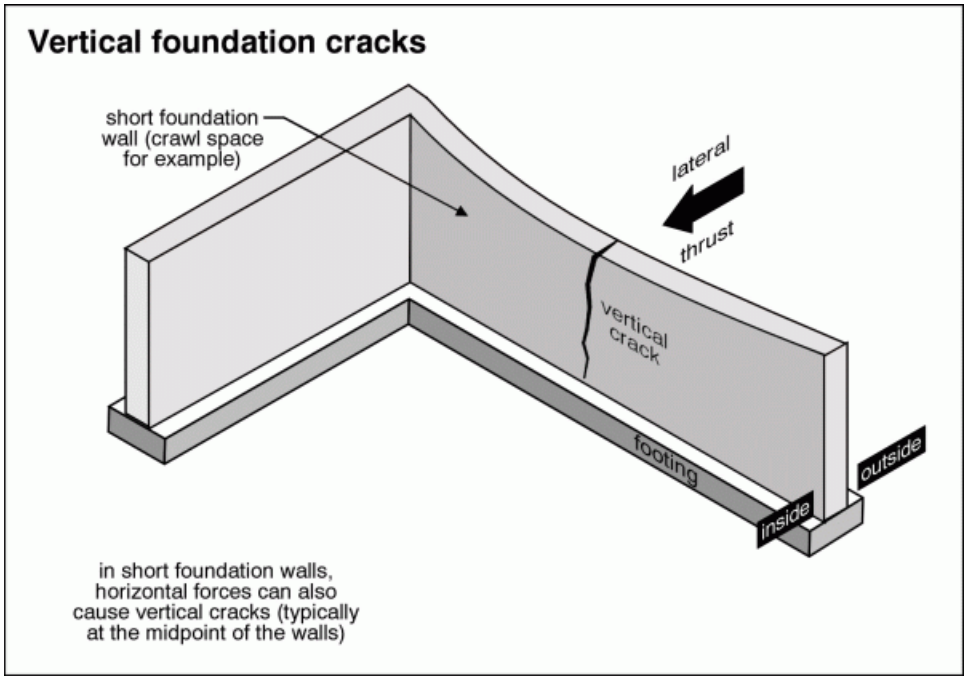
Implications ; Chance of further movement, Chance of further material deterioration

**Location**: South Exterior Wall Garage

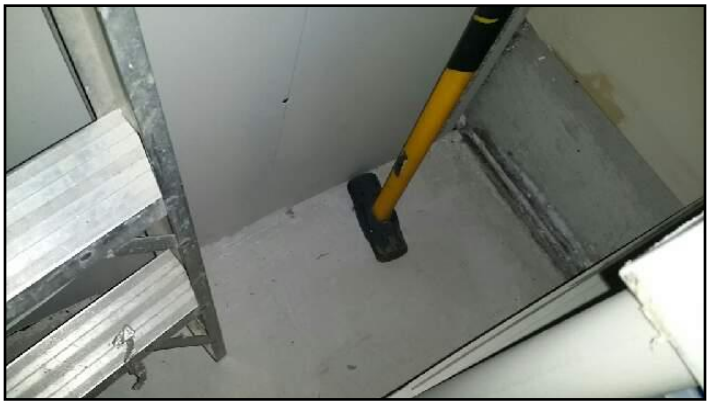
**Task**: Further evaluation,Repair

**Time**: Immediate

**Cost**: $500 - and up




*Cracked*



*Cracked*

**ROOF FRAMING \ Rafters/trusses**

**10. Condition:** • Appears to be a builder Repair

**Location**: Attic

**Task**: Disclosure

*Appears to be a builder Repair*

**ROOF FRAMING \ Sheathing**

**11. Condition:** • Mold

Implication : Chance of further growth , chance of environmental hazard ,chance of further material deterioration

**Location**: Attic

**Task**: Further evaluation,Repair

**Time**: Immediate

**Cost**: $3,000.00 and up

*Mold*

*Mold*

## Description

**Service entrance cable and location:** • Underground - not visible

**Service size:** • 200 Amps (240 Volts)

**Main disconnect/service box type and location:** • Breakers - basement

**System grounding material and type:** • Copper

**Distribution panel type and location:**

• Breakers - basement

*Breakers - basement*

**Auxiliary panel (subpanel) type and location:**

• Breakers - utility room

*Breakers - utility room*

• Note: found

Generator Basement


*Not found*

**Distribution wire material and type:** • Copper - non-metallic sheathed • Copper - metallic sheathed

**Type and number of outlets (receptacles):** • Grounded - typical

**Circuit interrupters: Ground Fault (GFCI) & Arc Fault (AFCI):** • GFCI - bathroom and exterior

**Smoke detectors:** • Present

**Carbon monoxide (CO) detectors:** • Present

## Limitations

**Inspection limited/prevented by:** • Generator ( Back-up ) Not Tested

*Note:* Recommend current maintenance company be retained for future maintenance


*Generator ( Back-up ) Not Tested*

**Panel covers:** • Disconnect covers are not removed by the building inspector

**System ground:** • Quality of ground not determined

**Circuit labels:** • The accuracy of the circuit index (labels) was not verified.

## Recommendations

**DISTRIBUTION SYSTEM \ Smoke detectors**

**12. Condition:** • Suggest replacement and/ or Install Smoke Detectors
**Implication(s)**: Life Threat / Fire hazard
**Location**: Home / As Required
**Task**: Provide
**Time**: Immediate
**Cost**: Less than $100 - per location

**DISTRIBUTION SYSTEM \ Carbon monoxide (CO) detectors**

**13. Condition:** • Suggest replacement/ Installation of CO Detectors
**Implication(s)**: Life Threat
**Location**: Home / As Required
**Task**: Provide
**Time**: Immediate
**Cost**: Less than $100 - per location

## Description

**Fuel/energy source:** • Electricity

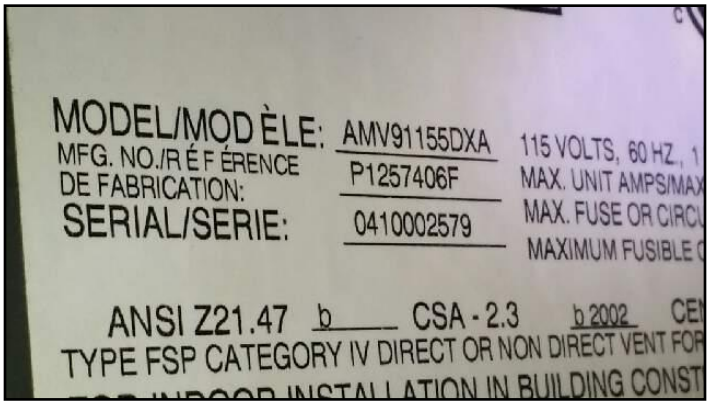
**System type:**

• Electric baseboard heaters

Basement Hall

**Furnace manufacturer:**

• Amana




*Amana*

**Approximate capacity:** • 110,000 BTU/hr

**Efficiency:** • High-efficiency

**Exhaust venting method:**

• Direct vent

ABS

**Approximate age:** • 11 years

**Typical life expectancy:** • Furnace (high efficiency) 15 to 20 years

**Main fuel shut off at:** • Furnace

**Main fuel shut off at:** • Water Heater

**Main fuel shut off at:** • Barbeque

*Barbeque*

**Main fuel shut off at:** • Meter • Utility room

**Failure probability:** • Low

**Auxiliary heat:** • Gas fireplace

**Chimney/vent:** • Masonry • Sidewall venting

**Chimney liner:** • Clay

**Combustion air source:** • Outside

## Limitations

**Inspection prevented/limited by:**
• System was inoperative
Both gas Fireplaces

**Heat exchanger:** • Only a small portion visible

## Recommendations

**FIREPLACE \ Gas fireplace**
**14. Condition:** • No Data Plate
**Implication(s)**: If data plate is not recovered unit will require replacement
**Location**: Basement Family Room
**Task**: Request Disclosure
**Time**: Immediate
**Cost**: $3,500.00 and up

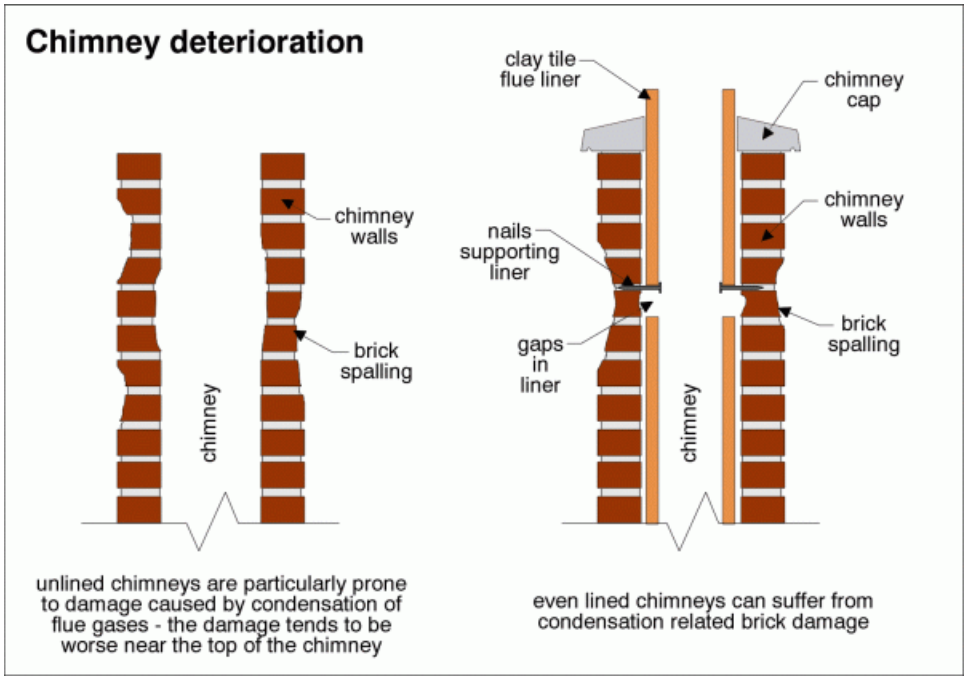
*No Data Plate*

**15. Condition:** • Not operational
**Implication(s)**: Not able to operate,use.
**Location**: Dining Room
**Task**: Repair or replace
**Time**: Discretionary
**Cost**: $3,500 and up

*Not operational*

**CHIMNEY AND VENT \ Masonry chimney**

**16. Condition:** • Loose, missing or deteriorated masonry
Neither Chimney flue is in use at this time.
**Implication(s)**: Material deterioration
**Location**: Chimney
**Task**: Repair,Remove
**Time**: Immediate
**Cost**: $1,000.00 - and up




*Loose, missing or deteriorated masonry*

## Description

**Air conditioning type:** • Air cooled

**Manufacturer:**

• Bryant


*Bryant*

**Cooling capacity:** • 36,000 BTU/hr

**Compressor type:** • Electric

**Compressor approximate age:** • 7 years

**Typical life expectancy:** • 10 to 20 years

**Failure probability:** • Low

**Refrigerant Type:** • R-410A

## Description

**Attic/roof insulation material:** • Glass fiber

**Attic/roof insulation amount/value:** • R-28

**Attic/roof ventilation:** • Roof and soffit vents

**Attic/roof air/vapor barrier:** • Plastic

## Limitations

**Attic inspection performed:** • From access hatch

**Air/vapor barrier system:** • Continuity not verified

## Recommendations

**RECOMMENDATIONS \ Overview**

**17. Condition:** • Ice Daming
**Location**: North Roof
**Task**: Further Evaluation ,Repair
**Time**: Immediate
**Cost**: $1,000 - and up

*Ice Daming*

**ATTIC/ROOF \ Insulation**

**18. Condition:** • Amount less than current standards
**Implication(s)**: Increased heating and cooling costs
**Location**: Attic
**Task**: Upgrade
**Time**: Discretionary
**Cost**: Obtain Estimate

## Description

**Water supply source:** • Drilled Well

**Service piping into building:** • Plastic

**Supply piping in building:** • Copper

**Main water shut off valve at the:**

• Utility room

*Utility room*

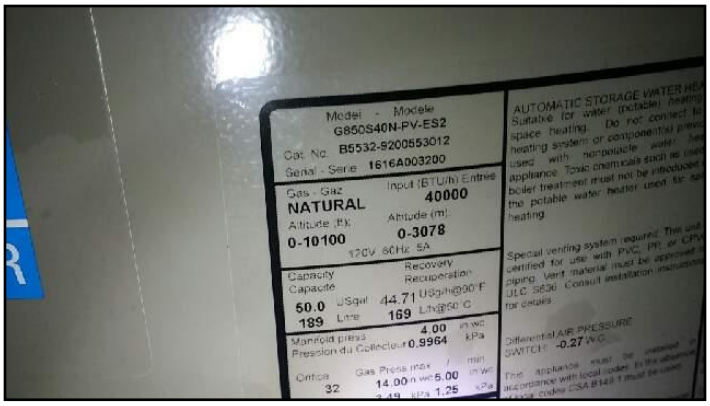
**Water flow and pressure:** • Functional

**Water heater fuel/energy source:** • Gas

**Water heater exhaust venting method:** • Direct Venting

*Note:* PVC 636

**Water heater manufacturer:** • GSW




*GSW*

**Tank capacity:** • 189 liters

**Water heater approximate age:** • New

**Typical life expectancy:** • 8 to 12 years

**Water heater failure probability:** • Low

**Waste disposal system:** • Septic system

**Waste and vent piping in building:** • ABS plastic

**Floor drain location:** • Utility Room

**Gas piping:** • Steel • CSST (Corrugated Stainless Steel Tubing)

**Backwater valve:** • Not present

## Limitations

**Items excluded from a building inspection:** • Water Supply (Gallons per Minute -Flow Rate )

**Items excluded from a building inspection:**

• Water quality

*Water quality*

• Concealed plumbing

## Recommendations

**General**

**19.** • Previous Repair

Incomplete

**Implication(s)**: Chance of water /Pest entry

**Location**: Basement Utility Room/Bathroom

**Task**: Repair

**Time**: Regular maintenance
**Cost**: $300 - and up

*Previous Repair*

**RECOMMENDATIONS \ Overview**

**20. Condition:** • Yard water
**Implication(s)**: Chance of supply line damage
**Location**: South Yard
**Task**: Request disclosure if winterized
**Time**: Immediate

**21. Condition:** • Well Casing to low
**Location**: North Yard
**Task**: Improve
**Time**: Immediate
**Cost**: $500 - and up

*Well Casing to low*

**SUPPLY PLUMBING \ Supply piping in building**

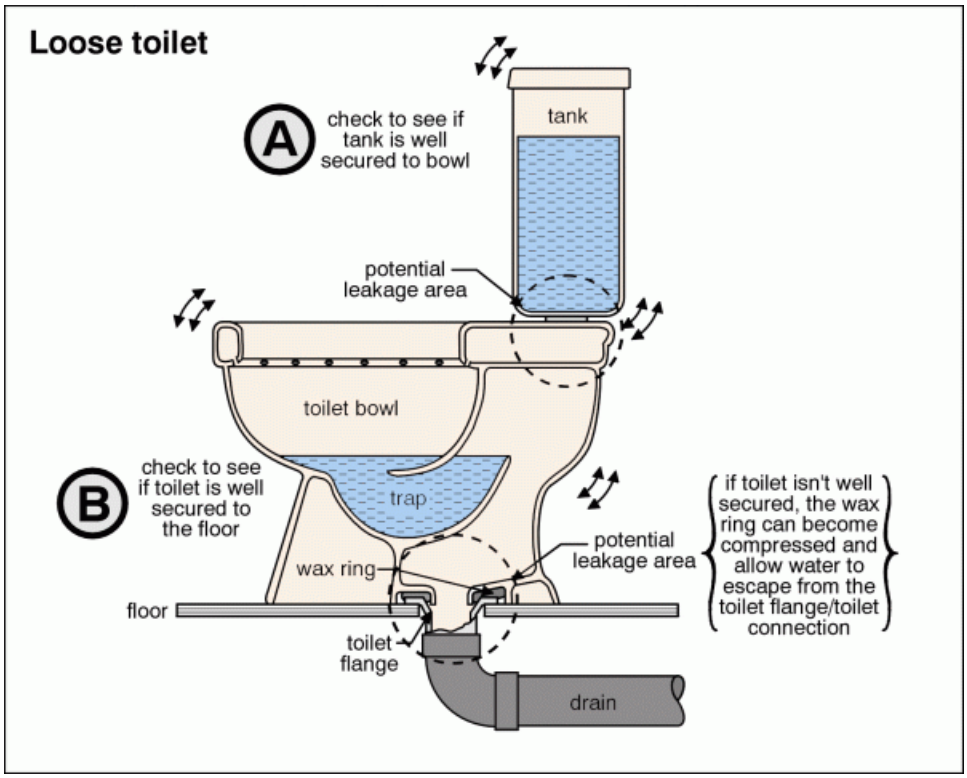
**22. Condition:** • Oxidized supply lines
**Implication(s)**: Chance of further deterioration
**Location**: Basement Utility Room
**Task**: Repair
**Time**: Regular maintenance
**Cost**: $500 - and up

*Oxidized supply lines*

**FIXTURES AND FAUCETS \ Toilet**

**23. Condition:** • Loose
**Implication(s)**: Sewage entering the building | Chance of water damage to contents, finishes and/or structure

**Location**: All Bathrooms
**Task**: Repair
**Time**: Regular maintenance
**Cost**: $500 - and up




*Loose*

**GAS SUPPLY \ Gas piping**

**24. Condition:** • Missing shut off valve
**Implication(s)**: Difficult to service
**Location**: Kitchen
**Task**: Provide
**Time**: Regular maintenance
**Cost**: $400 - and up

*Missing shut off valve*

**GAS SUPPLY \ Gas meter**

**25. Condition:** • Loose Meter
**Location**: Northwest Exterior Wall
**Task**: Repair
**Time**: Immediate
**Cost**: $300 - and up

*Loose Meter*

## Description

**Major floor finishes:** • Carpet • Laminate • Ceramic

**Major wall and ceiling finishes:** • Plaster/drywall • Stucco/texture/stipple

**Windows:** • Fixed • Casement • Vinyl

**Exterior doors - type/material:** • French • Metal-clad • Garage door - metal

**Doors:** • Inspected

**Counters and cabinets:** • Inspected

**Stairs and railings:** • Inspected

## Limitations

**Inspection limited/prevented by:** • Finished Basement

**Inspection limited/prevented by:** • New finishes/paint

**Not included as part of a building inspection:** • Cosmetic issues • Perimeter drainage tile around foundation, if any

## Recommendations

**WINDOWS \ Hardware**

**26. Condition:** • Inoperable

**Implication(s)**: System inoperative or difficult to operate

**Location**: Master Bedroom

**Task**: Repair or replace

**Time**: Regular maintenance

**Cost**: $200 - and up

*Inoperable*

**DOORS \ Doors and frames**

**27. Condition:** • Loose or poor fit

**Implication(s)**: Chance of damage to finishes and structure

**Location**: Basement Bathroom

**Task**: Repair

**Time**: Regular maintenance
**Cost**: $200 - and up

*Loose or poor fit*

**DOORS \ Hardware**

**28. Condition:** • Does not latch properly
**Implication(s)**: System inoperative or difficult to operate
**Location**: South Second Floor Bedroom
**Task**: Repair
**Time**: Regular maintenance
**Cost**: $200 - and up

*Does not latch properly*

**GARAGE \ Vehicle doors**

**29. Condition:** • Lower Seal Damaged
**Location**: Garage
**Task**: Repair or replace
**Time**: Regular maintenance
**Cost**: $300 - and up

## Description

**General:** • Flow Test Start

*Flow Test Start*

**Reason for Inspection:** • Real Estate Purchase

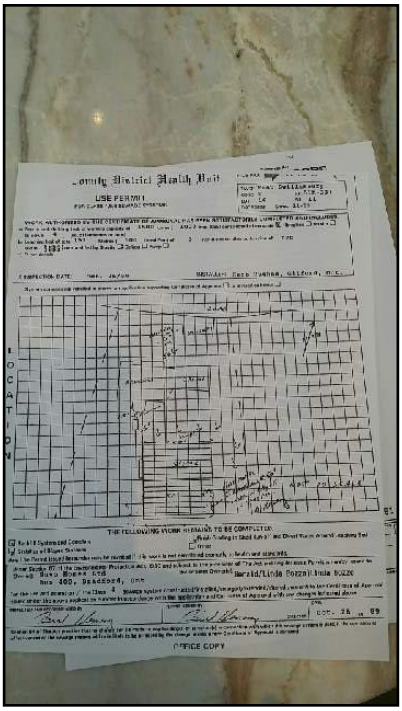
**Level of Inspection:** • Basic Real Estate

**Clients Future Plans for Property:** • Leaving as is

**Attendees at Inspection:** • Owner • Buyer • Buyer's Agent

**Home occupied - System In Use or at Rest:** • In Use

**Sewage System Documents or Permits:** • Attached




*Attached*

**Sewage System Type:** • (Class 4) Leaching bed

**Septic System Location:**

• South yard

*South yard*

*South yard*

**Approximate Year Septic System Installed:** • 1990

**Septic Tank Material:** • Concrete

**Septic Tank Inlet Baffle Material and Type:**

• Concrete

Note ; NOT IN USE

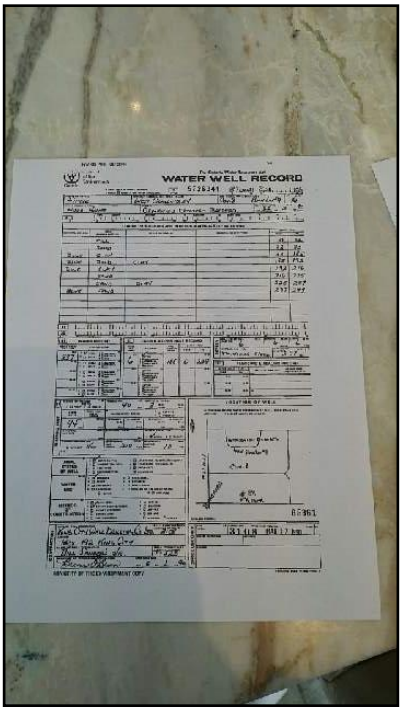
*Concrete*

**Septic Tank Outlet Baffle Material and Type:** • Concrete

**Effluent filter installed:** • No

**Potable Water Source:**

• Drilled Well




*Drilled Well*

## Limitations

**Percent of Leaching Bed not Visible or Found:**

• 100 %

Snow Covered

## Recommendations

**SEPTIC SYSTEM \ Typical life expectancy**

**30. Condition:** • Conventional Septic System 25 to 30 years

A flow (Load) test was performed ,the leeching bed accepted the load .The Leeching Bed operated as designed on day of Inspection.

**Location**: South Yard

**Task**: Disclosure

**SEPTIC TANK \ Inlet Baffles**

**31. Condition:** • Not Present

Implications: Poor breakdown of solids ,Chance of leeching bed failure ,

**Location**: South Yard

**Task**: Provide

**Time**: Immediate
**Cost**: $500 - and up

*Not Present*

**END OF REPORT**

# ABOUT YOUR HOUSE

CE40

# BUYING A HOUSE WITH A WELL AND SEPTIC SYSTEM

In rural areas, many homes do not have connections to municipal water and sewer lines. Homeowners rely upon privately owned or communal (shared) wells as their drinking water source, and individual septic systems to treat and discharge their wastewater. Homeowners must ensure that their well water is safe to drink, and that their well and septic system are properly maintained. A malfunctioning well or septic system can pose a health risk to your family and neighbours, and can be expensive to repair or replace. It is therefore important to conduct a detailed inspection of both the well and septic system prior to purchasing a home. This document will describe how wells and septic systems function and how to inspect them.

## WELLS

When you are purchasing a home with a private water supply (a well), there are three key items to consider:

- well system
- water quantity
- water quality

### *Well Systems*

There are three common types of wells: dug, bored and drilled.

**Dug** and **bored wells** (60-120 cm/24-48 in. diameter) are commonly used to produce water from shallow surface aquifers (less than 15 m/50 ft. deep); and, they are prone to contamination from surface water infiltration and to water shortages (see Figure 1 on page 2). An ***aquifer*** is an underground formation of permeable rock or loose material, which can produce useful quantities of water when tapped by a well. Another type of well used in surface aquifers is a sand point well (2.5-5 cm/1-2 in. diameter), which is a pointed well screen connected to a small diameter pipe driven into water-bearing sand or gravel.

**Drilled wells** (10-20 cm/4-8 in. diameter) are commonly used to penetrate deeper aquifers (15 to greater than 60 m/50 to greater than 200 ft. deep), are more costly to construct, but generally provide a safer source of drinking water (see Figure 2).

Common features of well systems include:

**casing** – structure around the well hole, which keeps it from collapsing. It could be a steel casing, concrete rings or an open hole in bedrock.

**inlet** – allows water to enter the well from the bottom. There might be a screen at the inlet to prevent fine particles from entering the well and a foot-valve (check valve) to maintain system prime and pressure.

**pumping system** – includes pump, piping and necessary electrical connections to pump water from the well into the house, and a pressure tank to maintain constant water pressure in the house. Submersible pumps are usually used in drilled wells, while shallow wells usually use centrifugal pumps, which are located out of the well, most likely in the basement or in a pump house.

**surface protection** – prevents surface water and contaminants from entering the well. Includes: watertight seal placed around the casing (annular seal), well cap 0.3–0.4 m (12-16 in.) above the ground, and mounded earth around the top of the well casing to divert rainwater.

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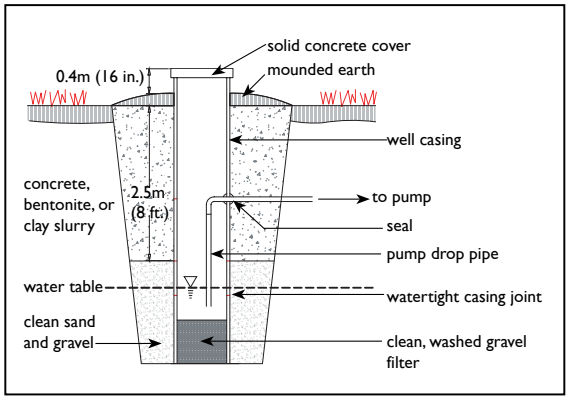


*Figure 1: Dug Well*

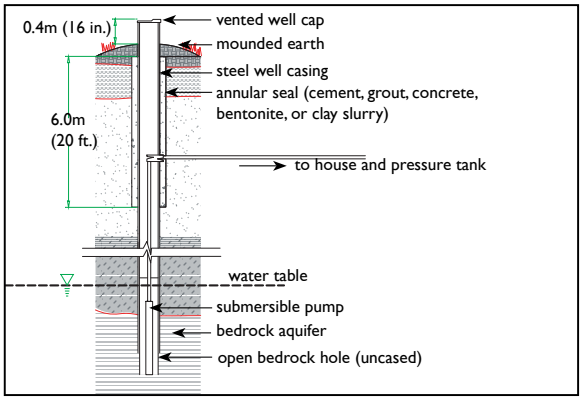


*Figure 2: Drilled Well*

### *Well Inspection Checklist*

The well should be inspected before the house is purchased. If there is a problem with the physical state of the well (for example, cracked seals, settled casing) contact a licensed well contractor to correct the problem. Check the Yellow Pages™ under "water well drilling and service" to find a local licensed well contractor.

❑ Well Record – Obtain a copy of the well record from the owner or the Ministry of the Environment. This should include: location of well, date of well drilling, depth and diameter of well, static water level, pumping water level, recommended pumping rate and the recommended pump setting.

❑ Location – (Figure 3) A well should be located at least 15 m (50 ft.) from any source of contamination if the casing is watertight to a depth of 6 m (20 ft.); otherwise, the separation distance should be at least 30 m (100 ft.). Sources of contamination include: septic systems, manure storages, fuel storages, agricultural fields (manure or fertilizer runoff), roads (salt runoff). Wells should be located at least 15 m (50 ft.) from a body of water.

❑ Well Cap - The cap should be at least 0.3 m (12 in.) above the ground. The well cap and seal should be securely in place and watertight. A locking cap would give some added security against tampering. Well caps are on drilled wells and well covers are on dug wells. Both types should be inspected.

❑ Well Casing - No cracks or settling of the casing should be visible. The ground should slope away from the casing.

❑ Drainage – Surface water should drain away from the well and water should not pond around the well casing.

❑ Well Pump – The well pump and distribution piping should be in good condition.

❑ Grass Buffer – A permanent grass buffer of a minimum 4 m (12 ft.) width should be maintained around the well head. Fertilizers and pesticides should not be applied to the grass buffer.

❑ Abandoned Wells – All abandoned wells on a property must be decommissioned (plugged) by a licensed well contractor. Ask the owner if there are any abandoned wells on the property and if they have been properly decommissioned.

❑ Inside the House – Check for sand or grit in the faucet strainer which indicates a corroded well screen. Verify that the pressure tank reads between 250 to 400 kPa (40 and 60 psi). Ensure that the check valve (or foot valve) is able to sustain the system pressure by drawing no water for 30 minutes to an hour and monitoring the pressure. The pressure should not drop nor should the pump start up during this dormant period.

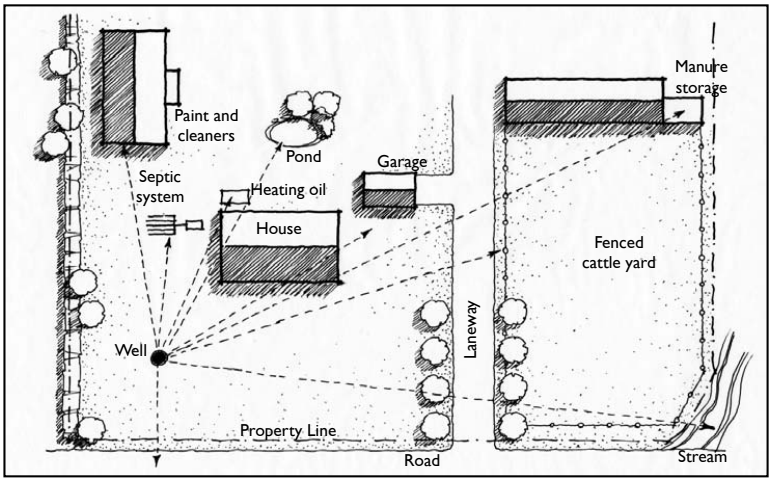


*Figure 3: Well Separation Distances*

### *Water Quantity*

Wells draw water from aquifers, which are zones of saturated permeable soil or rock. Some types of soil make for good aquifers, such as gravel and fractured bedrock that can support high water pumping rates, while other types of soil make for poor aquifers, such as silty sand and clay that cannot support high water pumping rates.

Wells can run dry for the following reasons:

- The pumping rate is higher than the groundwater recharge rate.
- The water table (level of saturated water in the soil) has dropped to below the pump suction or inlet.
- The well screen has become plugged by fine sand, chemical precipitation, bacterial fouling or corrosion.
- If a well vent becomes blocked, a negative pressure may occur (in the well) during draw down and reduce or stop the pump from drawing water.

If there is a water supply problem, a licensed well contractor should be consulted. Solutions may include: water conservation in the home, digging a deeper well, unplugging a fouled well screen or replacing a corroded well casing or screen. The cost of fixing the problem should be considered when negotiating the sale price for the home.

There are three sources of information to help determine if a well can produce a sufficient quantity of water:

- local knowledge
- well record
- water recovery test

**Local Knowledge:** The best indication of whether there is sufficient water supply is to ask the owner, neighbours or local well drillers if there have been any problems with wells running dry on the property and in the area. Generally, shallow wells are more likely to have problems with water shortages than deep wells, as shallow wells draw water from surface aquifers, which can fluctuate greatly depending upon the amount of precipitation.

**Well Record:** Obtain a copy of the well record from the previous owner or the Ministry of the Environment. The pumping water level indicates if the well is shallow or deep (less than 15 m/50 ft. is considered a shallow well). The recommended pumping rate should be greater than 14 L/min (3.6 US gal/min).

**Water Recovery Test:** A licensed contractor can be hired to conduct a recovery test which involves pumping water out of a well and then giving it time to recharge. This can help you determine how much water you can draw from the well. A well should be able to pump 14 L/min (3.6 US gal/min) for 120 minutes or 450 L/person/day (119 US gal/person/day) (Source: MOE, Procedure D-5-5, 1996). A recovery test can cost $200-$300 (Source: Gilles Bourgeois Well Drilling Ltd., St. Albert, ON, 2003).

#### *Water Quantity Checklist*

❑ Ask the owner, neighbours or a local well contractor if there have been any problems with the well or area wells running dry.

❑ Verify the depth of the well and pumping rate from the well record. A surface well is more likely to run dry in times of drought.

❑ Have a licensed well contractor conduct a recovery test, if necessary.

### *Water Quality*

The quality of the well water is very important. Poor water quality can lead to health problems, unpleasant taste and odour, and costly treatment systems and/or the costly use of bottled water. Well water can be contaminated with bacteria and chemicals. Common sources of contamination include infiltration from septic systems, manure runoff, pet waste, or road chemicals as well as dissolved chemicals naturally present in the groundwater such as calcium, sulphur, chloride or iron.

**Water Sampling**

Your offer of purchase should always include a requirement that closing is conditional upon an acceptable water quality evaluation. It would be ideal to take three water samples, about a week apart, with one of the samples taken after a rainstorm when surface water contamination is most likely. If possible, take the water samples yourself. The three samples should be analyzed for: total coliform, E. coli, and nitrate (~$30 each time) while one of the samples should also be analyzed for: sodium, hardness, sulphate, chloride, lead, iron, manganese and pH (~$80). Ask the laboratory to indicate the **drinking water standards** along with the results. Additional analyses can be conducted including: metals scan (~$70), pesticides if the well is in an agricultural area with heavy pesticide use (~$250), or gasoline and solvents if the well is near a gas station or industrial area (~$70).

Contact your local public health office for instructions on where to obtain appropriate sterile sampling bottles and where to submit water samples for testing. Bacteria and nitrate are analyzed free of charge in some provinces through local public health or Ministry of Environment offices, while the additional parameters will have to be analyzed at a private analytical laboratory.

If possible, samples should be taken from a tap between the well pump and any water treatment units and/or pressure tank. Follow the directions on the sample submission form for proper water sampling procedures.

**Test Results – What They Mean**

If concentrations are higher than the limits described below, consult a water treatment systems supplier to determine if a water treatment technology is appropriate. It is preferable to get several quotations.

**Health Indicators**

**Escherichia coli (E. coli) or faecal coliform:** These bacteria are found only in the digestive systems of humans and animals. Their presence in your well water is usually the result of

contamination by manure or human sewage from a nearby source such as a septic system or agricultural fields. Drinking water contaminated with E. coli or faecal coliform causes stomach cramps and/or diarrhoea as well as other problems and can even cause death. The drinking water standard for both E. coli and faecal coliform is **0 counts/100 ml**. A value of 1 or more indicates that the water is unsafe to drink.

**Total coliform**: This group of bacteria is always present in manure and sewage, but is also found naturally in soil and on vegetation. The presence of these bacteria in your well water may indicate that surface water is getting into your well. A total coliform value of 1-5 suggests that the safety of the water is doubtful, while a value of greater than 5 indicates that the water is unsafe to drink.

**Nitrate**: The presence of nitrate in your well water is usually the result of residential yard or agricultural fertilizers, or seepage from septic systems. Infants less than six months old can become sick from drinking formula made with water high in nitrate (greater than 10 mg/L). If you have an infant less than six months old, it is recommended to use bottled water.

**Sodium/Potassium Chloride**: Individuals who are on a sodium- (salt) reduced diet should consult with their physician if the level of sodium in their well water exceeds 20 mg/L. Domestic water softeners typically use sodium chloride and this increases the level of sodium in the drinking water. Potassium chloride is an alternative to sodium chloride for softening water. However, individuals suffering from hypertension, kidney disease or congestive heart failure should consult their physician prior to using drinking water containing high levels of sodium or potassium. A separate, unsoftened water supply (by-passing the water softener) can be installed for drinking and cooking purposes if sodium or potassium is a health concern.

**Sulphate**: At concentrations above 500 mg/L, sulphate can have a laxative effect and give a bitter taste to the water.

**Lead**: Lead concentrations in water are likely due to lead piping. Concentrations as low as 0.01 mg/L could cause long-term health problems.

**Aesthetic indicators**

**Hardness**: Hardness is a measure of calcium and magnesium in water. These elements precipitate with carbonate in boilers and pots to form scale. Hardness also makes it difficult to form lather, requires more soap, and creates a soap scum. Many homeowners decide to purchase a **water softener**, which replaces calcium and magnesium ions with sodium or potassium ions. Hardness (as calcium carbonate) above 80 mg/L could require a water softener.

**Chloride**: Chloride concentrations above 250 mg/L can give a salty taste to the water and may corrode piping.

**Iron and Manganese**: Well water with iron concentrations above 0.3 mg/L and manganese concentrations above 0.05 mg/L could stain plumbing fixtures and clothing; water may appear rust coloured or have black specks in it; can also cause a foul taste in the water and bacterial fouling of the well screen.

**pH:** pH values of less than 6.5 or greater than 8.5 may cause corrosion of piping.

### *Drilling a New Well*

The cost of a new well depends on the depth of the well and the local market. The following table provides an example of typical well installation costs.

*Table 1: Costs of Well Installation (source: Chalk Well Drilling Ltd, Napanee, ON, 2003)*

| Component | Cost |
|---|---|
| Drilling | $65/m ($20/ft.) |
| Casing | $33/m ($10/ft.) |
| Grout, seal, cap | $400/well |
| Screen | $1,200/well |

### *Water Quality Checklist*

❑ Water sampled on three different dates—preferably a week apart—from a tap between the well pump and any water treatment units and/or pressure tank for: total coliform, E. coli and nitrate.

❑ Water sampled once for: sodium, hardness, sulphate, chloride, lead, iron, manganese and pH.

❑ Obtain copies of previous water quality test results from the homeowner. Ask if there have been any water quality problems: frequent stomach illness (bacteria), odours (hydrogen sulphide, methane), rust spots (iron), scale (hardness), slime growth in faucets (iron or manganese), salty taste (chloride), bitter taste (sulphate).

❑ Review with the owner the operation and reason for any water treatment systems (water softener, disinfection system, reverse osmosis system, chlorination unit, etc.). Ask to see all treatment device operating manuals.

❑ Sample a glass of water for taste (salty, bitter), odours (hydrogen sulphide, methane), cloudiness (small particles) and colour (a rusty colour can indicate a high iron content). Remember you will be drinking this water every day.

❑ Look for scale on fixtures or around the faucets indicating hard water. Lift the lid and inspect the back of the toilet tank (the cistern) for sand, sediment, rust particles, scaling, biological growth and any other visual clues which may indicate water problems.

❑ Is there a "rotten egg" smell from the hot water heater? This indicates hydrogen sulphide gas, which can corrode piping.

## SEPTIC SYSTEMS

The septic system accepts wastewater from the home (sinks, shower, toilets, dishwasher, washing machine), treats the wastewater and returns the treated effluent to the groundwater. A conventional septic system is comprised of two components: a septic tank and a leaching bed.

### Septic Tank

A septic tank is a buried, watertight container, which accepts wastewater from your house (see Figure 4). Septic tanks can be made from concrete, polyethylene or fibreglass and in the past were sometimes made from steel (if the property has a steel tank, it is likely rusted through and needs replacing). Older tanks may be smaller than those found today (the minimum current size in Ontario is 3,600 L (952 US gal). Current tanks have two compartments, while older tanks may only have one compartment. Solids settle to the bottom of the tank to form a sludge layer, and oil and grease float to the top to form a scum layer. The tank should be pumped out every three to five years or when 1/3 of the tank volume is filled with solids (measured by a service provider such as a pumper). Some municipalities require that septic tanks be pumped out more frequently. Bacteria, which are naturally present in the tank, work to break down the sewage over time.

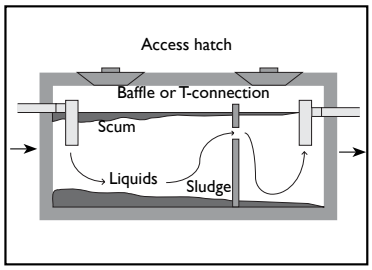


*Figure 4: Common Septic Tank (source: CMHC)*

### Leaching Bed

The wastewater exits the septic tank into the leaching bed—a system of perforated pipes in gravel trenches on a bed of unsaturated soil (minimum 0.9 m/3 ft. - see Figure 5). The wastewater percolates through the soil where microbes in the soil remove additional harmful bacteria, viruses and nutrients before returning the treated effluent to the groundwater. In cases where there is more than 0.9 m (3 ft.) of unsaturated soil from the high water table or bedrock, a **conventional system** is used, where the network of perforated drainage piping is installed either directly in the native soil or in imported sand if the native soil is not appropriate for treatment. In cases where the groundwater or bedrock is close to the surface, the leaching bed must be raised 0.9 m (3 ft.) above the high water table or bedrock. This is called a **raised bed system**.

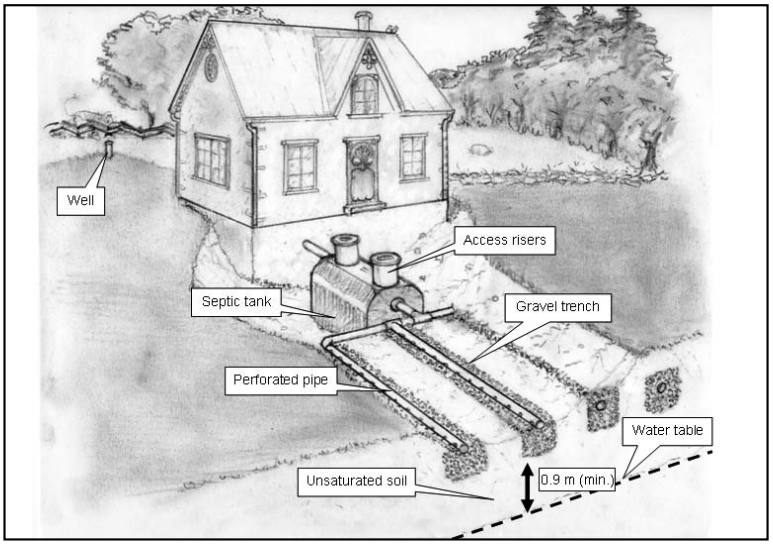


*Figure 5: Septic System (credit: Eric Brunet, Ontario Rural Wastewater Centre, University of Guelph)*

### Alternative Systems

Under certain site conditions such as limited lot area, high groundwater table or poor soil conditions (clay or bedrock for example), a conventional system will not provide sufficient treatment of the wastewater. Under these conditions, it is often possible to install an alternative treatment unit. The two most common types of alternative treatment units are trickling filters, where the effluent from the septic tank trickles through an unsaturated filter media (such as peat or a textile filter), and aeration systems, where the effluent from the septic tank passes through an aerated tank. Alternative treatment units provide a higher level of wastewater treatment, allowing the effluent to be discharged to a smaller area than in a conventional leaching bed. Effluent from an alternative treatment unit can also be discharged to a shallow buried trench, which is a pressurized pipe system 15 cm (6 in.) below the ground surface. In most provinces homeowners with alternative treatment units are required to have a maintenance contract with a service provider to inspect and maintain their systems.

### *Inspecting the Septic System*

You should have the septic system inspected by a certified on-site system professional (such as a certified installer or engineer) prior to purchasing the home. Call your local municipal office, public health office or Ministry of Environment office for a list of qualified professionals. Inspections can cost anywhere from $50 for a simple file search to $500 for a complete inspection of the tank and leaching bed.

The inspection should include: a discussion with the homeowner, a review of the system permit, a tank inspection, a leaching bed inspection and a house inspection.

### *System Replacement or Repair*

A septic system should last anywhere from 20-25 years, or even longer, if it is properly installed and maintained with regular pump-outs every three to five years. The cost of system replacement can vary between $12,000 to over $20,000 depending upon site conditions and local market conditions. The cost of system repair can vary from $500 for line flushing to $1,000 for a new septic tank to over $6,000 to replace clogged leaching bed lines (tile lines).

### *Questions to ask the homeowner:*

❑ Do you have a copy of the septic system permit?

❑ When was the last time the septic tank was pumped out? Are there records of system maintenance (tank pump-outs, system repair)?

❑ Have there been any problems with the septic system: system backing up, foul odours, effluent on the surface, soggy ground in the leaching bed, system freezing, toilet and drains gurgling or draining slowly?

❑ Have there been any potable water quality problems (E. coli, faecal coliform, nitrate)? This could be due to infiltration of the well by leakage from the septic system and could indicate a malfunctioning system. Results from the water quality samples that you take of the well water may help indicate septic system problems.

### *Permit Review Checklist*

The septic system permit can be obtained from the homeowner or the local municipal, Ministry of Environment or public health office, depending on the jurisdiction. There may not be a permit for older systems.

❑ Review the system permit: age, size and type of system and separation distances (particularly from wells).

❑ Verify the size of the system with respect to the size of the house.

### *Tank Inspection Checklist*

*NOTE: Never enter or stick your head into a septic tank. Dangerous gases are present in septic tanks, which can be lethal, even after the tank has been pumped out.*

❑ Compare the size of the tank and the expected water use, observe the general condition of the tank: baffles, partition wall, look for cracks and leaks. A steel tank is likely corroded and in need of replacement.

❑ Observe the water levels in the tank (too high suggests a clogged leaching bed while too low suggests a leaking tank).

❑ Have the septic tank pumped out (the owner should pay).

❑ Observe connections to the house and to the leaching bed (leaking pipes, crushed pipes), look for direct discharge of surface drainage into the tank. Tire tracks on the leaching bed could indicate crushed pipes.

❑ Clean the effluent filter (if one exists) by rinsing with an outdoor hose back into the septic tank.

### *Leaching Bed Inspection*

❑ Check for effluent on the surface, odours, lush growth, soggy field/ saturated soil.

❑ Check for obstructions to the leaching bed (pavement over bed, trees in bed).

❑ Verify that surface drainage is directed away from the leaching bed (for example, downspouts are not saturating the leaching bed).

❑ Dig test pits in the tile lines for signs of ponding water and biomat (slime) growth. This indicates plugged tile lines, which may require repair or eventual replacement.

❑ Inspect all mechanical equipment (pumps, aerators, alarms) to be in good working order.

### *Indoor Inspection Checklist*

❑ Check for leaking faucets and run-on toilets (a run-on toilet can flood the septic system). Slow moving drains and sewer-gas smells from flowing drains can indicate a failing system.

❑ Verify the plumbing (storm water and sump pump to ditch or dry well, toilet and sinks to septic system). If there is a direct grey water discharge (sinks and bathtub are not going to the septic system), it likely does not meet building code or health department standards. Connecting the grey water to the septic system may require the installation of a larger septic system.

❑ Water softener discharge: USEPA reports suggest that it is appropriate to discharge water softener backwash to a septic system. However, many jurisdictions encourage the discharge of the water softener's backwash to a sump pump, ditch or dry well.

❑ Under exceptional circumstances, the home may have a holding tank as opposed to a septic system. A holding tank must be pumped regularly (every few weeks) which can add a considerable expense to the household.

❑ Inspect the sewer vent stack for damage or blockage. Simply removing an old bird's nest might eliminate sewer-gas problems.

## WHERE CAN I GET MORE INFORMATION?

- local municipal offices or public health offices
- licensed septic system installers and well drillers (check the Yellow Pages™)
- provincial ministries of the environment

**Canada Mortgage and Housing Corporation**
www.cmhc.ca

**Ontario Rural Wastewater Centre**
www.orwc.uoguelph.ca

**Nova Scotia Department of Environment and Labour**
www.gov.ns.ca/enla/water

**Ontario Ministry of Agriculture and Food**
www.gov.on.ca/OMAFRA/english/environment/water/publications.htm

**USEPA Onsite/Decentralized Wastewater Homepage**
www.epa.gov/owm/onsite

**National Small Flows Clearinghouse**
www.nesc.wvu.edu

**Standards Council of Canada (SCC)**
http://www.scc.ca/accreditation/palcan/laboratories_e.html

**Canadian Council of Independent Laboratories (CCIL)**
http://www.ccil.com/locations.html

**Health Canada – Water Quality and Health**
www.hc-sc.gc.ca/waterquality

**WellOwner.org**
http://www.wellowner.org/index.shtml

CMHC acknowledges the contribution of the Ontario Rural Wastewater Centre, University of Guelph and Health Canada to the development of this document. For further information regarding water treatment and water quality, contact Health Canada at water_eau@hc-sc.gc.ca or call (613) 957-2991.

## Other useful information from Canada Mortgage and Housing Corporation

*Household Guide to Water Efficiency, $7.95 (61924)*

*About Your House* fact sheets, Free

*Your Septic System, (62795)*
*Hiring a Contractor, (62277)*
*Water Softeners, (62946)*
*Buying a Toilet, (62935)*

To order these publications (order number is shown in brackets) and to find out about other CMHC publications, contact:

your local CMHC office or
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa, ON K1A 0P7

Phone: **1 800 668-2642**
Fax: 1 800 245-9274

Visit our website at **www.cmhc.ca**



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# About your HOUSE

## YOUR SEPTIC SYSTEM

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### Where Does the Water Go?

Do you know where the water goes when you empty a sink or flush a toilet? If your home is in a city, the wastewater likely goes into a municipal sanitary sewer system to a sewage treatment plant. If your home is located in a rural area or a small community, you are likely one of the 25 per cent of Canadians whose wastewater is treated by a septic system (also referred to as an onsite wastewater system). A septic system treats your sewage right in your own yard and releases the treated effluent back into the groundwater (see Figure 1).

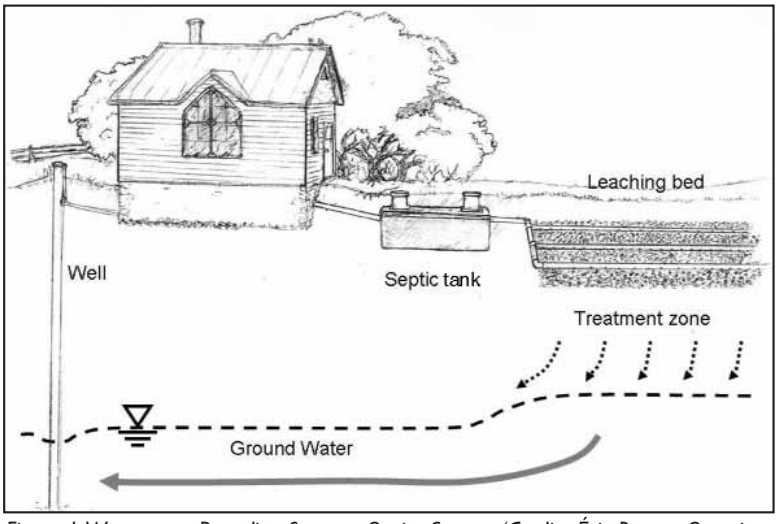


*Figure 1: Wastewater Recycling from an Onsite System (Credit: Éric Brunet, Ontario Rural Wastewater Centre, University of Guelph)*

### How Does My Septic System Work?

A properly functioning septic system receives all the wastewater created from household use (including toilets, showers, sinks, dishwasher, washing machine, and so on), treats the wastewater to a safe level, and returns the treated effluent to the groundwater system. A conventional septic system is composed of a septic tank and a soil filter called a leaching bed. A leaching bed may also be called a drain field, an absorption field or a tile field.

### Septic Tank

The purpose of the septic tank is to separate liquid from solids and to provide some breakdown of organic matter in the wastewater. A septic tank is a buried, watertight container made from concrete, polyethylene or fiberglass. In the past, the tank was sometimes made of steel or wood (if you have a steel tank, it is likely rusted through and needs replacing. If you have a wooden one it is likely rotting and may need replacing.). The size of the septic tank will depend upon the size of the house (number of bedrooms) and household water use, with minimum tank volumes ranging from 1,800 to 3,600 L depending on the province or territory. Older tanks may be smaller than those installed today and tanks may have one or two compartments, depending upon when and where they were installed.

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As wastewater from the house enters the septic tank, its velocity slows allowing heavier solids to settle to the bottom and lighter materials to float to the surface (see Figure 2). The accumulation of settled solids at the bottom of the tank is called "sludge" while the lighter solids (greases and fats), which form a mass on the surface, is called "scum". Anaerobic bacteria, which are always present in wastewater, digest some of the organic solids in the tank. Clarified wastewater in the middle of the tank flows by displacement into the leaching bed for further treatment in the soil layer.

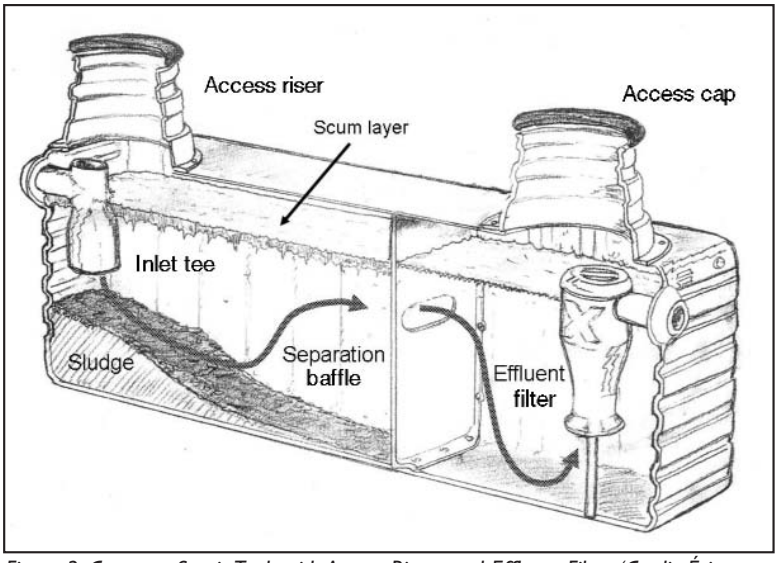


*Figure 2: Common Septic Tank with Access Risers and Effluent Filter (Credit: Éric Brunet, Ontario Rural Wastewater Centre–University of Guelph)*

### Leaching Bed

The partially treated wastewater from the septic tank flows into the leaching bed (see Figure 3). The leaching bed is typically a network of perforated plastic distribution pipes laid in gravel trenches over a layer of soil. In most provinces, the soil layer must be a minimum of 0.7-1.2 m above the high ground water table or a restrictive layer such as bedrock or clay and have a certain permeability (absorptive capacity). Older systems may have been constructed with clay tiles instead of plastic pipes, while new systems may use plastic chambers to replace the gravel trenches and perforated piping. The actual size, design and layout of the leaching bed is defined in Provincial/Territorial Code or Regulation and is based upon the volume of sewage generated, the absorptive capacity of the underlying soils, and the depth to the high groundwater table or limiting/ restrictive layer. Wastewater can flow by gravity from the septic tank to the distribution lines, or where required, can be collected in a pump chamber and pumped to a leaching bed at a higher elevation.

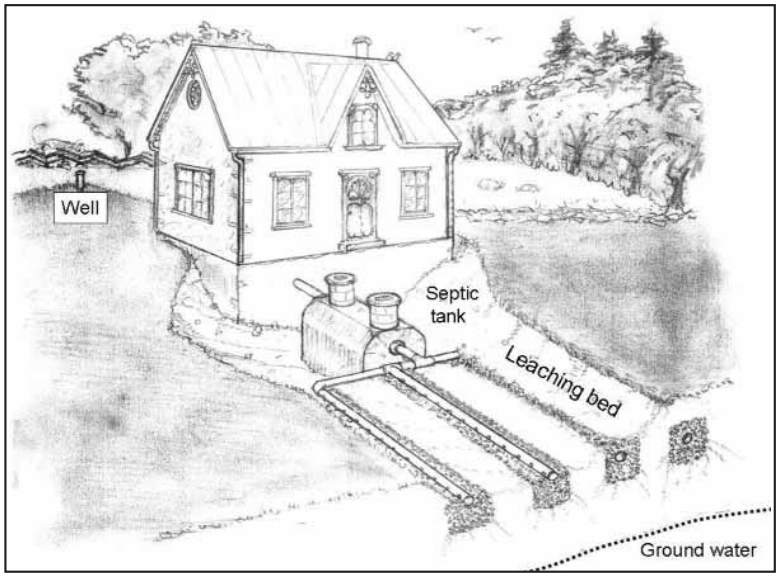


*Figure 3: Conventional Septic System (Credit: Éric Brunet, Ontario Rural Wastewater Centre–University of Guelph)*

The leaching bed is a soil filter which uses natural processes to treat the wastewater from the septic tank. Contaminants in the wastewater include solid and dissolved organic matter (carbon compounds), nutrients (nitrogen and phosphorus) and harmful bacteria and viruses. A slime layer of bacteria, called a "biomat" layer, forms at the bottom and sidewalls of each distribution trench; and it is in this layer where much of the treatment occurs. Bacteria in the biomat layer and surrounding soils consume the organic matter in the wastewater as well as transform ammonia nitrogen, which is toxic to some aquatic species, to the less toxic form of nitrate-nitrogen. Harmful bacteria and viruses present in the wastewater are largely removed in the leaching bed through filtration, predation (eaten by other microbes) and environmental exposure. Some leaching bed soils will contain iron, aluminum or calcium which can adsorb phosphorus from the wastewater. The soil bacteria which perform the treatment require oxygen to function; therefore the leaching bed must be installed in soils that are not saturated by surface water run-off or a high groundwater table, and should not be paved or covered over with pavement, patios, sheds, and so on.

The leaching bed soil must be the right type to retain the wastewater long enough for treatment to occur, while at the same time allowing the wastewater to infiltrate into the ground (Refer to your Provincial or Territorial Regulations).

In cases where there is a sufficient separation from either the high groundwater table or bedrock, the network of drainage piping is installed directly in the native soil or in imported sand if the permeability of the native soil is not suitable. This is called a conventional system (see Figure 3). In cases where the high groundwater table or bedrock is close to the surface, the leaching bed must be raised so that there is sufficient unsaturated soil under the drainage piping. This is called a raised (bed) system or a mound system (see Figure 4).

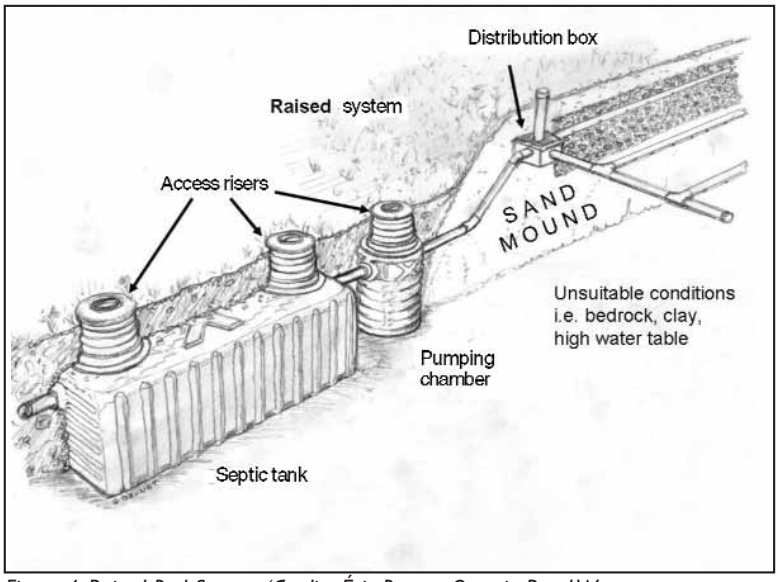


*Figure 4: Raised Bed System (Credit: Éric Brunet, Ontario Rural Wastewater Centre–University of Guelph)*

## Aerobic Treatment Technologies

There are many site conditions where it is impractical to impossible to install a conventional septic system such as: high groundwater table, bedrock, poor soil conditions (i.e. clay, silt, till) or inability to meet the setback distances from surface water, wells or property boundary lines. In these cases, an aerobic treatment technology is often used. These treatment technologies are proven technologies which have been on the market since the 1970s with numerous installations across North America. Aerobic technologies treat the wastewater to a higher level (secondary and tertiary) than a septic tank, permitting the treated effluent to be discharged into a much smaller area than is required for treatment by a conventional leaching bed. Each Province and Territory has its own regulations for aerobic treatment technologies and you should consult with your local regulatory authority to determine which technologies are approved in your locality.

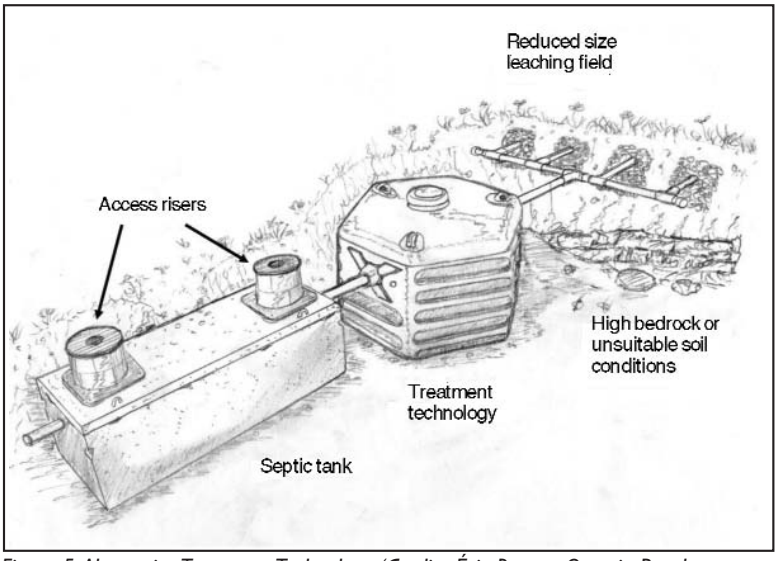


*Figure 5: Alternative Treatment Technology (Credit: Éric Brunet, Ontario Rural Wastewater Centre–University of Guelph)*

Aerobic treatment technologies typically have three components: a settling tank (this may be smaller than a conventional septic tank), the aerobic treatment unit which removes much of organic matter from the wastewater, and a dispersal system, which is often a small leaching bed (see Figure5).

Aerobic treatment technologies all rely on aerobic micro-organisms to break down the organic matter in the wastewater. In order to optimize treatment, the treatment unit vessels either include a material to support the growth of micro-organisms (called attached growth media), or a continuous mixer to keep micro-organisms in suspension (called suspended growth). Many technologies utilize either an air pump or blower to provide oxygen to the micro-organisms, while some technologies are designed as "trickling filters", where effluent is dosed onto an unsaturated media and the micro-organisms use the oxygen in the air which surrounds the media.

The treated effluent is typically discharged into a small leaching bed, although there are alternative methods in some jurisdictions including pressure distribution systems near the soil surface or even discharge to surface waters. Consult with your provincial/territorial authority to see which methods of dispersal are permitted in your area.

In most Provinces, homeowners with aerobic treatment technologies are required to have a maintenance contract with an authorized service provider to inspect and maintain their systems. Things to consider when purchasing an aerobic treatment technology are

- Is the technology or product brand approved in your Province?
- Does the manufacturer provide a reliable service contract and support in your area?
- What are the maintenance requirements and costs associated with the technology (frequency and timing required for inspections, effluent sampling, and replacement parts)?
- What is the cost and availability to replacement parts?
- What are the annual energy costs (pumps, aerators)?
- What are the frequency, volume and costs of pumping out the system?
- What are the special considerations for installing the system for seasonal use and winterization?

## What Do I Need to Do to Keep My Septic System Working?

Access Risers - Having easy access to the septic tank is the first step to routine maintenance. For tanks that are buried in the ground it is a very good idea to install access risers, which extend the tank lids to or near the surface (see Figure 2). Should there be a need to access the tank during the winter, risers will make the job much easier. Risers can be made of plastic or concrete and must be secured against entry.

Tank Pump-out–Over time, the sludge will build up in the bottom of the septic tank. If the sludge is allowed to accumulate it will eventually flow into the leaching bed and rapidly clog the distribution pipes. Once the pipes become clogged, the wastewater will either seep to the surface of the ground, or worse yet, back up into your house. Not only can a clogged septic system be hazardous to the environment and to your family's health, it also represents a very expensive repair bill.

A septic tank should generally be pumped out every three to five years or when 1/3 of the tank volume is filled with solids (measured by a qualified practitioner). The frequency of pumping out the tank will depend upon household water use (number of people) and the size of the septic tank. For example, a family of five with a 2,300 L tank may require a tank pump-out as frequently as every two to three years, while a retired couple with a 3,600 L tank may only require a tank pump-out only every five to seven years. Some jurisdictions define how frequently a septic tank must be pumped out. In the Province of Quebec, for instance, septic tanks are required to be pumped every two years for full time residences and every four years for seasonal residences.

The best time to have the tank pumped out is summer to early fall. At these times, the ground will not be frozen, allowing easier access to the tank, and the biological activity in the tank can re-establish itself before it gets too cold (micro-organisms like it warm). In the spring, a high water table caused by melted snow can sometimes create sufficient pressure on the underside of an empty tank to push it up out of the ground. This is more of a concern with lighter tanks made of polyethylene or fibreglass than those made of concrete.

Never inspect or pump out a septic tank yourself. There is no oxygen in the tank for you to breathe and the tank contains deadly gases which can kill you in only a few seconds. When it is time to clean or inspect your tank, call a licensed pumper.

Effluent Filters – An effluent filter is a relatively new accessory for a septic tank. It is a simple filter which is installed at the outlet of the septic tank to prevent large solid particles from flowing out of the septic tank and into the leaching bed. An effluent filter could prevent the premature clogging of your leaching bed with solids. There are many different effluent filters on the market, so consult with a local contractor to determine which filter is best for your system. Effluent filters need to be cleaned periodically depending upon the type and size of filter and household water use. Some filter models can be fitted with an alarm which sounds when the filter requires cleaning.

What Not to Put Down the Drain – Because septic systems rely on bacteria to break down the waste material, it is important that you don't poison these micro-organisms. Even small amounts of paints, solvents, thinners, nail polish remover and other common household compounds flushed or poured down the drain can kill the bacteria that break down the organic matter in the wastewater. Household disinfectants such as laundry bleach or toilet bowl cleaner can be used in moderation without affecting the operation of the septic system; however, overuse of disinfectants can kill the bacteria in a septic tank. Some manufacturers promote the use of septic tank "cleaners", "starters" or "enhancers" to aid in the digestion of the waste. These products are typically of little value and are not recommended. You should avoid putting anything into the septic system that doesn't break down naturally or anything that takes a long time to break down. Materials such as oils, grease, and fat, disposable diapers, tampons and their holders, condoms, paper towels, facial tissues, cat box litter, plastics, cigarette filters, coffee grounds, egg shells, and other kitchen wastes, should never be put into the septic system. You should also avoid the use of in-sink garbage disposal units ("Garburators") unless the septic tank and leaching bed are designed to accommodate the increase water and organic load created from these devices.

## I Need to Control My Water Usage?

Every time you put water into the septic tank, that same amount of water moves into the leaching bed. The longer the wastewater is retained in the septic tank, the more the effluent has less suspended solids and organic matter. Conversely, if the water moves too quickly through the septic system (through excessive water use in the household), the solids may not have time to settle out and then could flow into the leaching bed. Therefore, whenever possible, you should try to regulate the amount of water entering the septic system; for instance, laundry can be spread out over several days during the week. You can reduce water usage by installing water saving features in plumbing fixtures and by only running the washer or dishwasher when it is full. Fix leaky faucets and watch out for running toilets—a running toilet can waste a huge amount of water and can wash out a septic tank. Foundation drainage (sump pump) and furnace condensate should be excluded from the septic tank. You can also control the amount and timing of wastewater you put into the system by using a discharge pump package to dose the leaching bed.

## How Do I Look After the Leaching Bed?

Looking after the leaching bed is easy. There's nothing you have to do, but there are a few things you shouldn't do. The area over the leaching bed should have a good cover of grass. Good ventilation and adequate sunlight should also be maintained to promote evaporation. This means that nothing should be constructed over the leaching bed including: parking areas, patios, tennis courts, decks or storage sheds. Covering the leaching bed will prevent oxygen from getting into the soil. The bacteria responsible for digesting the wastewater need oxygen to survive and function. You should not drive vehicles or machinery over the bed, as the weight could crush the distribution pipes or compact the soil. In winter, you should also keep snowmobiles off the leaching bed. The compaction of the snow will reduce its natural insulating effect, increasing the chances of the pipes freezing. Don't plant trees or shrubs near the leaching bed. The roots of some trees, especially willows and poplars, will travel significant distances to reach water. The roots can plug and damage the distribution pipes. Lastly, don't water the grass over the leaching bed and ensure that all surface drainage (particularly eave troughs) is directed away from the leaching bed. The additional water may interfere with the ability of the soil to absorb and treat the wastewater.

The leaching bed of a conventional septic system should last at least 20 years; however, the distribution lines will eventually become clogged with biomat and the bed will have to be repaired or replaced.

## How Will I Know if I Have a Problem with My Septic System?

Some of the warning signs that your septic system may be failing include the following:

- The ground around the septic tank or over the leaching bed may be soggy or spongy to walk on.
- Toilets, showers and sinks may back up or may take longer than usual to drain.
- Occasional sewage odours may become noticeable, particularly after a rainfall.
- Gray or black liquids may be surfacing in your yard or backing up through fixtures into the house.
- *E. coli* or fecal coliform indicator bacteria may be found in nearby well water or in a surface ditch close to the leaching bed.
- The water level in the septic tank is higher than the outlet pipe (this indicates that the water is ponding in the distribution lines)—inspection should be conducted by a qualified practitioner
- Wastewater is ponding in the distribution lines—inspection should be conducted by a qualified practitioner or an engineer.

## How do I Prevent my System from Freezing?

Septic systems are most likely to freeze in periods of cold temperature when there is little snow cover. The first line of defence against system freezing is adequate insulation. Adding 0.3 m (1 ft) of mulch (leaves, straw, hay) or letting the grass grow long over the system in the fall will provide a good insulating layer. Snow can also be piled over the system in the early winter. Other options include: insulate the pipe from the house to the septic tank, add Styrofoam sheets above the septic tank, and increase the soil cover over the system.

There are three major causes of system freezing

1. Pipes Not Draining Properly – Any standing water in pipes may freeze. This may result from poor installation without sufficient slope or ground settling or frost heaving over time. The solution to this problem is to excavate and replace the faulty section of piping.
2. Low Water Usage – Water slowly trickling through piping (for instance from a leaking tap or toilet) can create a film of water which can freeze the line solid. Low water use (or vacancy) for an extended period of time can lead to the septic tank freezing. If you are going away for an extended period of time during the winter, it is a good idea to have the tank pumped out before you leave.
3. Waterlogged System – If your leaching bed is saturated (either through poor design or clogging of the distribution lines) it could freeze solid. If this happens, the only solution is to use the septic tank as a holding tank until spring, when the leaching bed thaws and can be repaired or replaced. This means the septic tank will have to be pumped out every time it fills up, which could be as frequently as twice a week. If you have to use your septic tank as a holding tank, it would be a good idea to have the pumper install a high level alarm in the tank to indicate when pumping is required.

If your system freezes call a qualified practitioner (pumper, installer). Many contractors have high pressure steamers to defrost frozen piping or can install heat tape or a tank heater. Do not add antifreeze, salt or additives to the tank and do not try and run water continuously to unfreeze the system.

## What If I Have to Repair My Septic System?

If you notice a problem with your system, it is important that you take action immediately to protect your health and the environment. Contact a qualified practitioner to advise you on how to proceed. Repairs can range from pumping out the septic tank, repairing a broken tank baffle or cracked pipe, levelling the distribution header line, replacing the septic tank to ultimately replacing the entire leaching bed.

## Your Septic System and the Law

You are required by law to report any problem to your local authorities before proceeding with repairs or replacement. A final inspection will need to be carried out and a Use Permit granted before you can legally use a new or altered septic system. Your contractor and/or your local authorities can also help you determine the required size of your septic system. You may find that you need a larger system than you currently have. If you are repairing, replacing or installing a new septic system, you will also have to be aware of the legal limitations imposed on where your septic system can be located with respect to your house and your well, your neighbour's house and well, and nearby bodies of water. These distances are required to help ensure that wastewater from your septic system cannot reach and contaminate nearby water supplies. Depending upon the province, the leaching bed must be at least 1.5-9 m from a property line, 3-11 m from a building, 15-30.5 m from a well, and 15-75 m from a body of water .

The agency responsible for onsite septic system permits varies depending on the province or territory and is described in the Table on page 8:

| Province/Territory | Department/Ministry | *Act*/Regulation |
|---|---|---|
| Prince Edward Island | Department of Technology and Environment | *Environmental Protection — Act* Sewage Disposal Regulation |
| Newfoundland and Labrador | Department of Health | *Public Health Act*–Sanitation Regulation |
| Nova Scotia | Department of the Environment | *Environment Act*–On-site Sewage Disposal Regulation |
| New Brunswick | Department of Health and Community Services | *Health Act*–Regulation 88-200 |
| Quebec | Department of Environment | *Environmental Quality Act*–Regulation Respecting Wastewater Disposal Systems for Isolated Dwellings |
| Ontario | Ministry of Municipal Affairs and Housing | Ontario Building Code Part 8 |
| Manitoba | Department of the Environment | *Environment Act*–Private Sewage Disposal Systems and Privies Regulation |
| Saskatchewan | Department of Health | *Public Health Act*–Plumbing and Drainage Regulation |
| Alberta | Ministry of Labour | *Safety Codes Act*–Alberta Private Sewage Systems Standards of Practice |
| British Columbia | Ministry of Health Services | *Health Act*–Sewerage System Regulation |
| North West Territories | Department of Health and Social Services | *Public Health Act*–General Sanitation Regulations |
| Yukon Territory | Department of Health | *Public Health and Safety Act*–Sewage Disposal System Regulations |

*Table 1: Provincial/Territorial Septic System Regulations*

## WHERE CAN I GET MORE INFORMATION?

- local municipal offices or public health offices
- licensed septic system installers (check the Yellow Pages™ )
- provincial and territorial ministries responsible for septic systems (e.g. environment, health)

Canada Mortgage and Housing Corporation
www.cmhc.ca

Ontario Rural Wastewater Centre
www.orwc.uoguelph.ca

Centre for Water Resources Studies
www.centreforwaterresourcesstudies.dal.ca

USEPA Onsite/Decentralized Wastewater Homepage
www.epa.gov/owm/onsite

National Small Flows Clearinghouse
www.nesc.wvu.edu

**About Your House**

Your Septic System

**To find more *About Your House* fact sheets plus a wide variety of information products, visit our Website at www.cmhc.ca. You can also reach us by telephone at 1 800 668-2642 or by fax at 1 800 245-9274.**

## Priced Publications

*Household Guide to Water Efficiency* — *Order No. 61924*

## Free Publications

**About Your House** *fact sheets*

*Buying A Toilet* — *Order No. 62935*

*Hiring A Contractor* — *Order No. 62277*

*Buying a House with a Well & Septic System* — *Order No. 63319*

The links below connect you to a series of documents that will help you understand your home and how it works. These are in addition to links attached to specific items in the report.

Click on any link to read about that system.

- 01. ROOFING, FLASHINGS AND CHIMNEYS
- 02. EXTERIOR
- 03. STRUCTURE
- 04. ELECTRICAL
- 05. HEATING
- 06. COOLING/HEAT PUMPS
- 07. INSULATION
- 08. PLUMBING
- 09. INTERIOR
- 10. APPLIANCES
- 11. LIFE CYCLES AND COSTS
- 12. SUPPLEMENTARY
  - Asbestos
  - Radon
  - Urea Formaldehyde Foam Insulation (UFFI)
  - Lead
  - Carbon Monoxide
  - Mold
  - Household Pests
  - Termites and Carpenter Ants
- 13. HOME SET-UP AND MAINTENANCE
- 14. MORE ABOUT HOME INSPECTIONS