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Self-Help Advice

Prepare to survive a major EARTHQUAKE



Canada

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EARTHQUAKES IN CANADA?



Earthquakes can happen in virtually any region of Canada. Seismologists estimate that more than 2,500 earthquakes are recorded each year across the country. In fact, a strong earthquake affecting one of Canada's major urban areas is the most destructive natural disaster this country is ever likely to experience.

In the past 100 years, at least nine earthquakes in or near Canada have registered between 7 and 8 on the Richter scale. A few have caused extensive damage. Even a magnitude 6 earthquake could do extensive damage in a built-up area.

Seismologists now know that a major destructive earthquake can occur at any time along the coast of British Columbia. Exactly when the earthquake will happen cannot be predicted, but there is a high probability that inhabitants of the Canadian West Coast will be shaken by a moderate to strong earthquake during their lifetime.

Moderate earthquakes in the range of 6 on the Richter scale can also occur in Eastern and Northern Canada. In these regions, the Canadian Shield could carry the shock waves from an earthquake over a wide area, potentially causing significant damage.



WHAT IS AN EARTHQUAKE?

Physically, an earthquake is the result of a sudden movement of two blocks of rock along a break (fault) deep within the earth's crust.

WHAT HAPPENS DURING AN EARTHQUAKE?

If you are near the source of an earthquake, expect a loud bang followed by shaking. If you are farther away, the first warning may be a sudden noise, roar or swaying of the building you are in. Next, you will feel shaking, quickly followed by a rolling motion that rotates up, down and sideways. It's bound to be a frightening experience. A moderate earthquake may last only a few seconds. A large earthquake could last several minutes.

EARTHQUAKE MYTHS

An earthquake does *not* cause the earth to split open and swallow up people and neighbourhoods. Buildings do not automatically collapse, either. However, you could be hurt by shattered glass, falling objects and heavy objects thrown around by the shaking. Broken gas mains and fallen chimneys can cause fires. Downed power lines and broken water mains can also wreak havoc.

AFTERSHOCKS

Aftershocks are smaller earthquakes that happen when the earth underneath the surface adjusts to a new position. Aftershocks may happen for some time after the initial earthquake. Over time, they generally grow weaker.

TSUNAMIS



A tsunami is a series of travelling waves generated by an earthquake below the ocean floor. The wave may have sufficient energy to travel across entire oceans. Tsunamis steepen and increase in height on approaching shallow water and can surge over low-lying coastal areas, causing severe damage.

EARTHQUAKE DAMAGE

Although ground shaking is the major source of earthquake damage, secondary effects such as landslides, the liquefaction of saturated sandy soils, flooding of low-lying areas, and tsunamis or tidal waves washing over coastlines can also cause loss of life and massive destruction to property and the environment.

In recent years, large buildings, roadways and other infrastructures have been built on reclaimed land, steep slopes and unstable soils. Such areas are at high risk of being damaged by a large earthquake. This also means that in future, earthquakes in such built-up areas could affect more people and cause more damage than in the past.

WHAT IS BEING DONE IN CANADA TO HELP MITIGATE POTENTIAL EARTHQUAKE DAMAGE?

Ongoing research by scientists, engineers and emergency preparedness officials means they are learning more about how earthquakes are produced and what effects they can have on various structures. This research has resulted in improvements to the National Building Code of Canada and means modern buildings in earthquake-prone areas have built-in earthquake resistance to help limit damage and injuries.

Although all levels of government in Canada are co-operating in the effort to put emergency plans and response procedures in place in order to mitigate the effects of major disasters on Canadian communities, individuals and families should also take responsibility for being prepared for earthquakes and other major emergencies.

PREPARING FOR AN EARTHQUAKE

No one can predict or prevent an earthquake. When an earthquake strikes, you must be ready to act immediately. To help you survive, you and members of your household should prepare personal and family survival plans NOW!

Preparing for an earthquake takes time and effort. The information provided in this booklet can help you and your family plan, so you can:

- avoid injury and help others
- minimize damage to your property
- survive at least 72 hours after an earthquake in your home or workplace without help from emergency response officials.



TIPS ON WHAT TO DO *BEFORE* AN EARTHQUAKE

- Prepare an emergency plan for your family and household.
- If you live alone, develop a plan for yourself with links to neighbours and friends.
- Take a first aid course, including cardio-pulmonary resuscitation (CPR).
- Know the safe places to be — and where not to be — in your home during an earthquake. Practise taking cover in the safe places.

Safe places under heavy tables or desks; inside hallways; corners of rooms or strong archways.

Dangerous places: near windows or mirrors; under any heavy objects that can fall; the kitchen where the stove, refrigerator or contents of cupboards may fall on you; doorways where the shaking may slam the door on you.

Chances of survival are improved if emergency plans are prepared and practised together as a family, now. Start by discussing what could happen and what you should do at home, at school or at work if an earthquake strikes. Prepare a list of what needs to be done ahead of time to be prepared. Divide up tasks so that everyone involved in the plan participates as much as possible. Write down and exercise your plan. Make sure everybody has a copy and keeps it close at hand.

PREPARE YOUR HOME FOR EARTHQUAKES

Go through your home, imagining what could happen to each part of it, if shaken by a violent earthquake.

- Teach everybody in the family how to turn off the water and electricity.
- Clearly label the on-off position for the water, electricity and gas.
- If your home is equipped with natural gas: tie or tape the appropriate wrench on or near the pipe, to turn off the gas, if necessary. *(Don't shut off the gas unless there is a leak or a fire. If the gas is turned off, don't turn it on again. That must be done by a qualified technician.)*

If you live in an apartment block or a multi-storey building, you may experience more sway and less shaking than in a smaller, single-storey building.

Work with your building manager or condominium board to decide how best to “quake-safe” your unit. Seek advice from professionals (building engineers, architects, emergency preparedness authorities) if you are unsure about what to do.

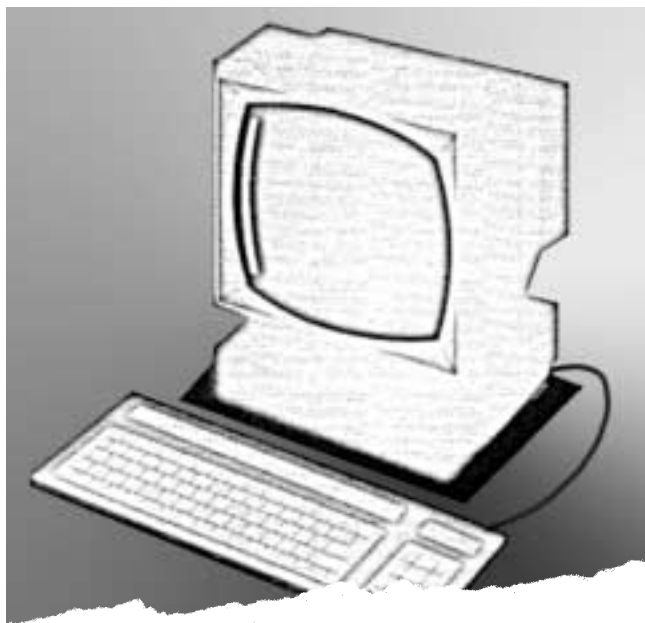
CHECK FOR HOME HAZARDS

Previous earthquakes show that you have a better chance of surviving and minimizing damage to your home if you take the following preventive measures now:

- Make sure the house is bolted to its foundation.
- Make sure the walls are braced.
- Repair loose roof shingles.
- Make sure the chimneys are strong and well-braced.
- Tie down the water heater and other heavy appliances (stove, washer, dryer) that could break gas or water lines if they topple.
- Secure top-heavy furniture and shelving units to prevent tipping. Keep heavy items on lower shelves.

- Affix mirrors, paintings and other hanging objects securely, so they won't fall off hooks.
- Locate beds and chairs away from chimneys and windows. Don't hang heavy pictures and other items over beds. Closed curtains and blinds will help stop broken window glass from falling on beds.
- Put anti-skid pads under TVs, VCRs, computers and small appliances or secure them with Velcro or other such product.
- Use child-proof or safety latches on cupboards to stop contents from spilling out.
- Keep flammable items and household chemicals away from heat and where they are less likely to spill.
- Put plywood up in the attic on joists around each chimney to help prevent bricks and mortar from coming through the ceiling. (Check clearances with your local fire department.)

Discuss earthquake insurance with your insurance broker. Check your coverage — it could affect your financial ability to recover losses after an earthquake.

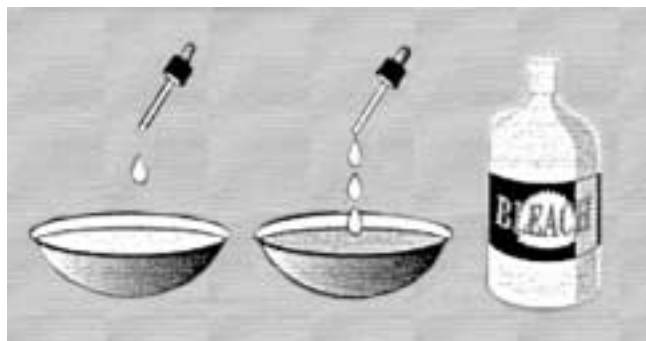


ASSEMBLE A HOME EMERGENCY SUPPLY KIT

Assemble the *essential* emergency supplies listed below, *now* and keep them in your home emergency kit(s). Store them in secure containers (such as plastic garbage bins) in a safe place in your home (under the stairs, in a closet). Supplies should be in easy-to-carry containers, ready to take with you.

Store an emergency kit in your car, toolshed or garage in case you have to evacuate your home and can't go back in.

These supplies will help make you self-sufficient for three to five days.



WATER IS ESSENTIAL FOR SURVIVAL

Store at least 4 litres of water per person per day.

- store the water you usually drink
- use small-necked plastic bottles that have been washed, disinfected and are easily carried
- store water in a cool, dark place
- on each bottle, record the date you bottled the water
- replace stored tap water every six months
- *if you have pets, don't forget to store adequate water for them. (Approximately 30 millilitres of water per kilogram of the animal's weight, per day.)*

Keep a supply of water-purifying tablets and non-perfumed chlorine bleach in your

emergency kit. In an emergency, water can also be made safe to drink by using water purification tablets according to directions or by adding one drop of liquid [non-perfumed] chlorine bleach per litre of water or three drops per litre of cloudy water. Stir and let sit for 30 minutes before drinking.

Water can also be made safe to drink by boiling it for 10 minutes.

You may be able to get an emergency supply of water for washing from the hot water heater or toilet tank.

FOOD

Choose foods that require no refrigeration, cooking or preparation, are compact and lightweight. Choose food that is liked by and familiar to those most likely to eat it. If food must be cooked, include a “camp stove” and fuel. Some examples of food choices include:

- ready-to-eat canned meals: stews, baked beans, pasta, meat, fish, poultry, fruits, vegetables, cereals, “trail mix,” oatmeal cookies, candies or jellies;
- freeze-dried foods;
- canned milk, juices, coffee, tea;
- staples such as sugar, salt, pepper, powdered coffee whitener;
- eating utensils;
- any special dietary requirements: such as baby food and formula;
- if you have pets, don’t forget food for them.

Keep a manual can-opener with the canned foods.

CLOTHING

Include one change of clothing and footwear per person: sweaters, woollen socks, hat, scarf, mittens, underwear, rain gear, sturdy, waterproof shoes or boots, *heavy work gloves are a must.*

BEDDING

A sleeping bag or two warm blankets per person.

SHELTER

A plastic tarpaulin, a small tent, emergency “space” blankets or even some large garbage bags.

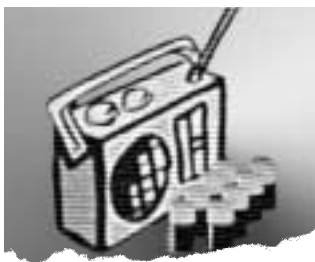
FIRST AID KIT

- Keep a complete first aid kit and basic first aid manual in your home and car.
- Include over-the-counter medications such as pain reliever, anti-septic etc.
- Include a list of the prescription medications taken by each family member. List the name of family physician/ specialists, style and serial number of medical devices such as pacemakers, hearing aids, eyeglass prescriptions.
- If required, include denture needs, contact lens liquids, hearing aids, mobility aids and a few days supply of any essential regular medication such as insulin.



SUPPLIES AND TOOLS

- Keep a battery-powered AM/FM radio and spare* batteries at home and at the workplace
- candles
- flashlight and spare batteries. Keep a flashlight (one per person) near your bed, in your car and at work. Have spare* batteries in each location
- hammer and nails, crowbar, pry bar, axe (spare pry bar should also be stored outside in toolshed or garage)
- lantern and fuel



** consider replacing batteries yearly, to keep them fresh*

- matches (in waterproof container)
- mosquito repellent
- plastic sheeting/tarpaulin
- pliers
- rope, duct tape
- small shovel
- pen, marker, note pad
- pocket knife
- whistle (three short blasts is the recognized signal for help)
- gasoline-powered generator and appropriately rated extension cord

Always keep the following items handy

- Class ABC fire extinguisher (make sure everybody knows how to use it).
- Wrench (crescent or pipe if you have to turn off the natural gas). Tie or tape the appropriate wrench to the pipe. Remember: *Don't shut off the gas unless there is a leak or a fire. If the gas is turned off, don't turn it on again. That must be done by a qualified technician.*
- Shoes — heavy enough to protect feet from broken glass and other debris (consider everybody keeping a pair under the bed).



SANITATION

- toilet paper, moist towelettes, facial tissues, liquid detergent
- personal items: soap, shampoo, deodorant, toothpaste, toothbrushes, towel, face cloth, comb, lip balm, sanitary napkins/tampons
- plastic garbage bags and ties
- chlorine bleach, liquid disinfectant
- portable toilet

SPECIAL ITEMS

- cards, games, books appropriate to family interests/ages
- colouring books, crayons, toys, drawing paper for children
- photos of family members and loved ones

FAMILY RECORDS AND DOCUMENTS

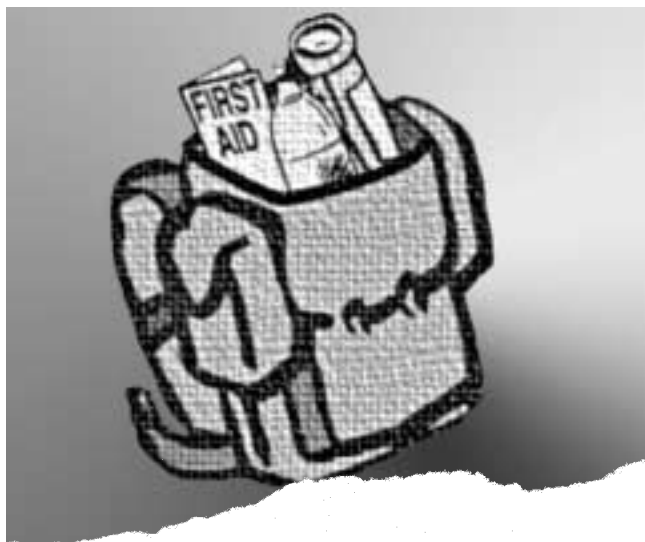
Store important family documents and records (such as the following) in waterproof container(s):

- will, insurance policies, contracts, deeds, stocks and bonds;
- passports, social insurance cards, health cards, immunization records;
- cash/coins;
- savings and chequing account numbers;
- credit card account numbers and companies;
- important telephone numbers;
- family records (birth, marriage etc. certificates).

PUT TOGETHER *INDIVIDUAL EVACUATION PACKS*

You should have the items in this list in addition to the supplies for your home emergency kit. Each person in your household should have the items in a tote bag or back-pack, stored in a secure place with the other emergency supplies. They should be ready to go if you have to evacuate on short notice.

- food such as dried fruit, high-energy food bars, candies etc.
- first aid kit and booklet; survival manual
- flashlight and batteries
- money, including coins/phone card
- photographs of family and loved ones
- gloves and other warm clothing



- address book with important family phone numbers, particularly those in another town/city

Remember to add necessities for babies, small children, elderly and people with disabilities in your household.

When you evacuate, supplement the items in individual evacuation packs with other items from your store of emergency supplies including:

- bottled water (ideally, 4 litres per person per day);
- cooking/eating utensils.

Be sure to take prescribed medications such as heart and high blood pressure medication, insulin set, with you when you evacuate.

PUT TOGETHER AN EMERGENCY PACK FOR YOUR VEHICLE

The items in this list are in addition to the supplies in your home emergency kit. Keep them in your vehicle in a separate pack (such as a tote bag) in case you are “on the road” during an earthquake. Make up a pack for each vehicle in your household.

- booster cables, tools
- bottled water — at least four litres
- canned food/opener, dried fruit, cookies, crackers
- outdoor clothing and a backpack
- sleeping bag(s), “space” blanket(s)
- first aid kit
- flashlight and spare batteries
- waterproof matches, candles
- toilet tissue, moist towelettes, small plastic bags
- cash, coins
- map of the region where you live
- pen/pencil and paper
- consider including playing cards, colouring books etc. for children



Remember. Fill up your vehicle’s gas tank when it is about half full. Gas stations are likely to be inoperable after a major earthquake.

PUT TOGETHER AN EMERGENCY PACK FOR YOUR *WORKPLACE*

Keeep the following items in a separate pack (such as a tote bag) stored in a convenient place in your workplace/office ready in case you have to walk home or to safety.

- gloves, walking shoes, outdoor clothing
- emergency (“space”) blanket
- flashlight, radio and batteries (stored separately in waterproof bags)

- whistle (three short blasts is the recognized signal for help)
- bottled water
- dried fruit, nuts, high-energy food bars
- small photos of your family loved ones
- paper with your name, address and any special medical conditions

MAKE SURE YOU HAVE A FAMILY/HOUSEHOLD EMERGENCY CONTACT PLAN

- Make sure each family member knows what to do if at home, at school or if the quake separates one or more family members from the others.
- Pre-select an appropriate out-of-the area contact that should be notified about the family's status after the earthquake. This contact, ideally a family member or close family friend, should also agree to pass on news to other family members if individuals get separated and call the contact separately. Each member of the household should memorize this contact's phone number and address and keep it with them at all times.
- Agree on an alternate meeting place if it's impossible to get home.
- Become familiar with the emergency plans for the school(s) your children attend.

REMINDERS

- Rely on emergency authorities for guidance.
- Listen to radio or television broadcasts for instructions from emergency authorities after the earthquake.
- Emergency phone numbers are found on the inside cover of most telephone books. Phone them only in an extreme emergency. However, your telephone may not work after an earthquake, or it may take a while to get a dial tone.
- Learn how to shut off the utilities in your home — gas, electricity and water. (Don't shut off the gas unless there is a leak or a fire. If the gas is turned off, don't turn it on again — that must be done by a qualified technician.)
- Make sure each member of your family knows how to use a fire extinguisher.
- Take a first-aid course including cardio-pulmonary resuscitation (CPR).
- Become familiar with the emergency plan for the school(s) your children attend.
- Share your emergency plan with neighbours.

HOW TO PROTECT YOURSELF DURING AN EARTHQUAKE

Practising and reading about what you should do during an earthquake will help you remain calm, be better prepared to protect yourself and help others. Identify safe spots in each room in your home. Reinforce this knowledge by physically placing yourself in the safe location. This is an especially important step for children.

Wherever you are when the earthquake starts, take cover immediately and stay there until the shaking stops.

IF INDOORS

Stay there. Don't run outside.

Take cover under a heavy table, desk or any solid furniture and hold on.

If in a hallway, crouch down against an inside wall.

Avoid doorways. Doors may slam shut and cause injuries.

Protect your head and face.

Move away from windows, glass partitions, mirrors, fireplaces, bookcases, tall furniture, light fixtures.

If in a wheelchair, lock the wheels and protect the back of neck and head.

If in a hotel, keep shoes under the bed; clothes close by; consider travelling with a battery-powered radio and flashlight and extra batteries; identify the safest place in your hotel room to take shelter (such as under a table); read all material on safety provided in your room and note the emergency exits on your floor.

Do not use elevators. If you're in an elevator during an earthquake, hit the button for every floor and get out as soon as you can.



IF OUTDOORS

Stay there. Try to move to a safe spot away from windows, buildings, overhead wires or telephone poles.

IF YOU ARE IN A VEHICLE

Try to pull over to a safe place. Try not to block the road. Park away from bridges, overpasses and buildings, if possible. Stay in the vehicle.

IF YOU ARE IN A CROWDED PUBLIC PLACE

Try to take cover where you won't get trampled. If you are inside, don't run outside where you may be hit by falling debris.

Sidewalks next to tall buildings are particularly dangerous. In shopping centres, try to take cover in the nearest store. Keep away from windows, skylights, and display shelves laden with heavy objects.

IF AT SCHOOL

Get under a desk or table and hold on. Face away from windows.

IF ON A BUS

Stay in your seat until the bus stops.

Wherever you are, expect the ground or floor to move violently. Take cover. If you can't take cover, sit down in a crouched position and protect your head and face from falling debris and splintering glass. Remain in a protected place until the shaking stops. Expect aftershocks — they may occur for some time after the initial quake.



WHAT DO *AFTER* AN EARTHQUAKE

In the immediate aftermath of the disaster, *try to remain calm*. You may find yourself in the position of taking charge of other people. Take care of life-threatening situations first.

- Check yourself and others nearby for injuries — administer first aid.
- Stay off the telephone unless you have to report a serious, life-threatening emergency.
- Put on sturdy shoes and protective clothing to help prevent injury from debris, especially broken glass.
- Check your home for structural damage and other hazards. If you suspect your home is unsafe, do not re-enter.
- Do not light matches or turn on light switches until you are sure there are no gas leaks or flammable liquids spilled. Use a flashlight to check utilities and do not shut them off unless damaged. Leaking gas will smell.
- If tap water is still available immediately after the earthquake, fill a bathtub and other containers in case the supply gets cut off. If there is no running water, remember that you may have water available in a hot water tank and toilet reservoir.
- Do not flush toilets if you suspect sewer lines are broken.
- Carefully clean up any spilled hazardous materials. Wear proper hand and eye protection.
- If you have to leave your home, take your evacuation pack and other essential items with you. Post a message in clear view where you can be found.
- Place a HELP sign in your window if you need assistance.
- Listen to your battery-powered radio (or car radio) for instructions from emergency officials.

- Do not use your vehicle, except in extreme emergency or unless told to do so by emergency officials. Keep roads clear for rescue and emergency vehicles.
- Do not attempt to get out of your car if downed power lines are across it. *Wait to be rescued.*
- Stay at least 10 metres away from downed power lines.
- Avoid waterfront areas in case of a tsunami. If a *tsunami warning* is issued, follow evacuation instructions immediately.
- If you have pets, try to find and comfort them. Confine them at home if you have to evacuate.
- Check on your neighbours after looking after members of your own household. Organize rescue measures if people are trapped.
- Perishable foods will spoil quickly if the power is out. These foods, if still cold, should be cooked first. Foods in the freezer can stay frozen for a couple of days without power if the door to the freezer is not opened frequently.
- If perishable foods are not refrigerated for 24 hours, DO NOT USE. When in doubt, throw it out.
- Discard cans that are puffed up or leaking.

Planning for a severe earthquake will also help prepare you for many other emergencies

For more information on earthquake preparedness, you may wish to contact:

- Canada Mortgage and Housing Corporation (CMHC), Canada's housing agency, has a wide range of housing-related information. For details, contact CMHC's Canadian Housing Information Centre at 1-800-668-2642. You can also visit CMHC on the Internet at www.cmhc-schl.gc.ca
- Your community's emergency planning organization (for details on local emergency plans)
- Your provincial or territorial emergency measures organization
- The closest regional office of the Office of Critical Infrastructure Protection and Emergency Preparedness (there is one in each provincial capital)
- The Geological Survey of Canada (for information on earthquakes in Canada)
- Emergency Services Division, Health Canada

For more self-help advice on emergency preparedness, contact:

**OFFICE OF CRITICAL
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Fax: (613) 998-9589

E-mail: communications@ocipep-bpiepc.gc.ca

Internet: <http://www.ocipep-bpiepc.gc.ca>

PROVINCIAL/TERRITORIAL EMERGENCY MEASURES ORGANIZATIONS

British Columbia

Provincial Emergency Program (PEP)

Phone: (250) 952-4913

Fax: (250) 952-4888

Yukon

Emergency Measures Organization

Phone: (867) 667-5220

Fax: (867) 393-6266

Alberta

Disaster Services Branch

Phone: (780) 422-9000

Fax: (780) 422-1549

Toll free in Alberta, dial 310-0000-780-427-9000

Northwest Territories

Emergency Measures Organization

Phone: (867) 920-6133

Fax: (867) 873-8193

Saskatchewan

Saskatchewan Municipal Affairs and Housing
Protection and Emergency Services

Phone: (306) 787-9563

Fax: (306) 787-1694

Manitoba

Manitoba Emergency Management
Organization (MEMO)

Phone: (204) 945-4772

Fax: (204) 945-4620

Ontario

Emergency Measures Ontario

Phone: (416) 314-3723

Fax: (416) 314-3758

Quebec

Territorial Directorate

Phone: (418) 646-7950

Fax: (418) 646-5427

Or one of the regional directorates:

Montréal (514) 873-1300

Montréal et Estrie (514) 873-1324

Laval, Lanaudière et Laurentides	(514) 873-1300
Outaouais, Abitibi – Témiscamingue et Nord du Québec	(819) 772-3737
Bas-Saint-Laurent, Gaspésie et Îles-de la-Madeleine	(418) 727-3589
Saguenay – Lac-Saint-Jean et Côte-Nord	(418) 695-7872
Capitale-Nationale, Chaudière-Appalaches et Nunavik	(418) 643-3244
Mauricie et Centre-du- Québec	(819) 371-6703
Or one of the regional offices:	
Sherbrooke	(819) 820-3631
Saint-Jérôme	(450) 569-7565
Joliette	(450) 757-7996
Rouyn-Noranda	(819) 763-3636
Gaspé	(418) 360-8097
Baie-Comeau	(418) 295-4903
Baie-Saint-Paul	(418) 435-2530

New Brunswick

New Brunswick Emergency Measures
Organization

Phone: (506) 453-2133

Fax: (506) 453-5513

Nova Scotia

Nova Scotia Emergency Measures Organization

Phone: (902) 424-5620

Fax: (902) 424-5376

Prince Edward Island

Emergency Measures Organization

Phone: (902) 888-8050

Fax: (902) 888-8054

24/7 Inquiry Line: (902) 892-9365

Newfoundland and Labrador

Emergency Measures Division

Phone: (709) 729-3703

Fax: (709) 729-3857

Nunavut

Nunavut Emergency Management

Phone: (867) 979-6262

Fax: (867) 979-4221

For more information on emergency preparedness, please contact your provincial/territorial emergency measures organization.



SAFE GUARD is a national information program based on partnerships and aimed at increasing public awareness of emergency preparedness in Canada.

The **SAFE GUARD** program brings together government, private organizations and voluntary agencies that are part of the emergency preparedness, response, recovery and mitigation community.

The triangle depicted in the program logo is the international symbol of emergency preparedness. The jagged line evokes the maple leaf, Canada's internationally recognized symbol. The amber yellow colour is a sign of caution and warning.

SAFE GUARD is an Office of Critical Infrastructure Protection and Emergency Preparedness program.