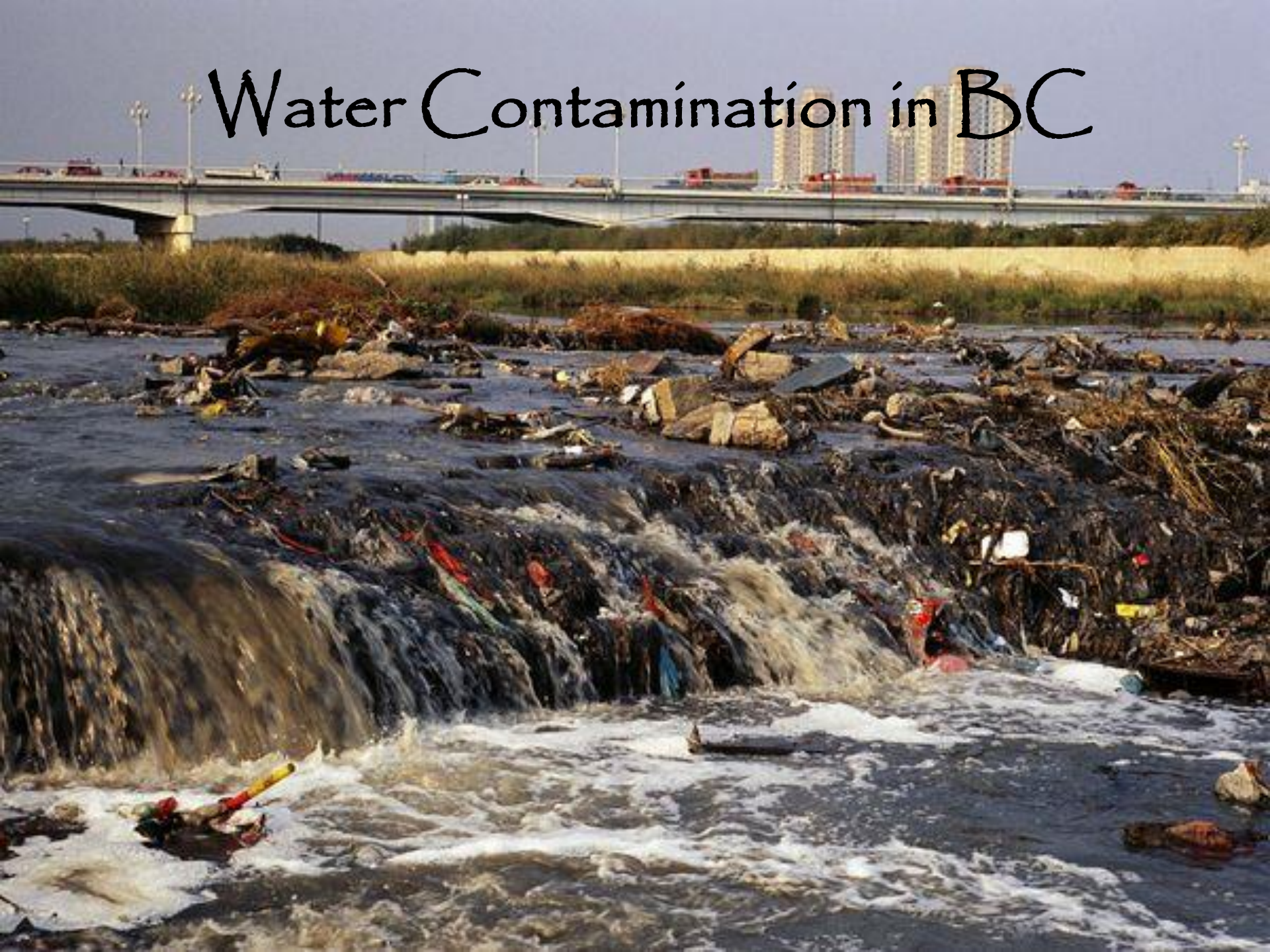
Water Contamination in BC

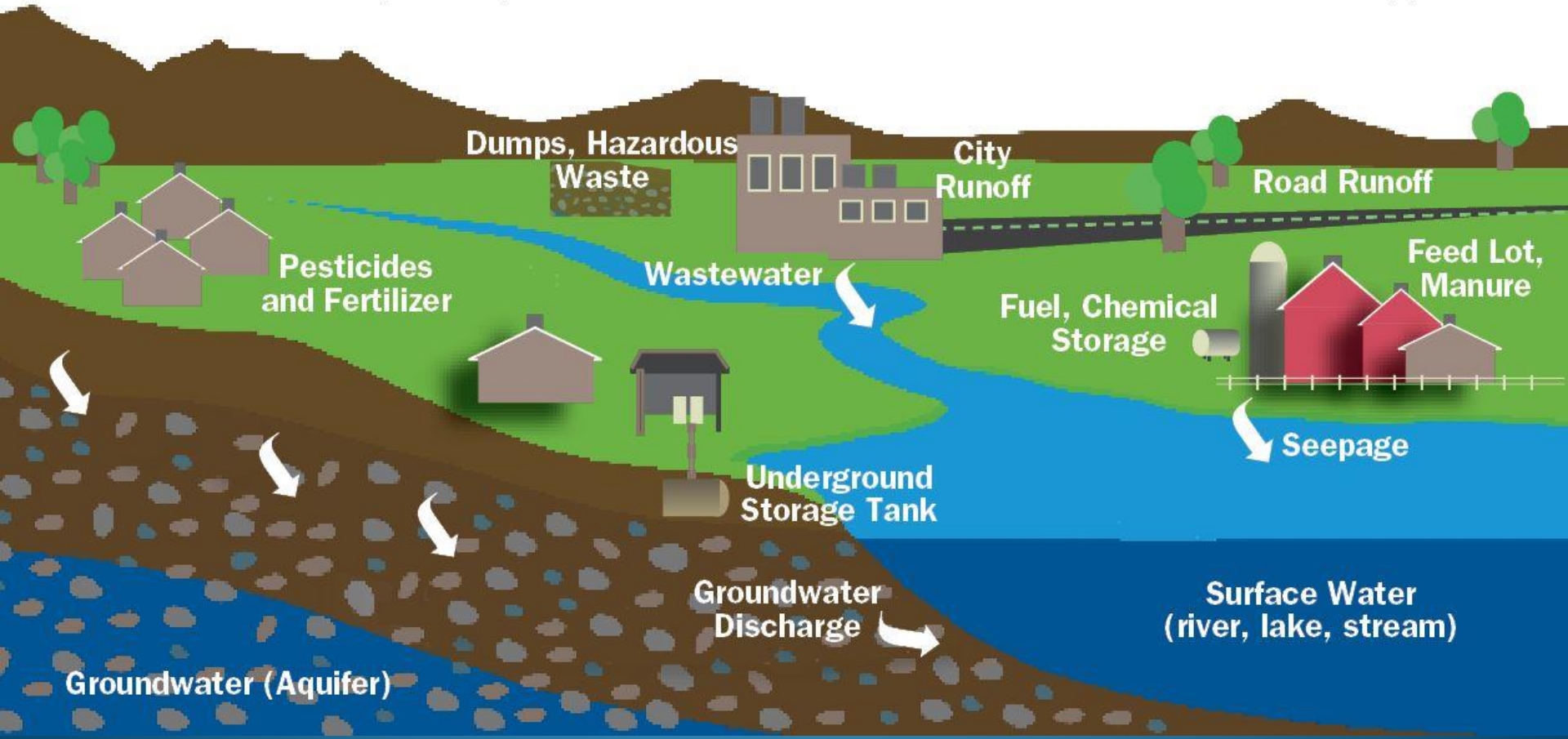


Fresh Water Pollution in Canada

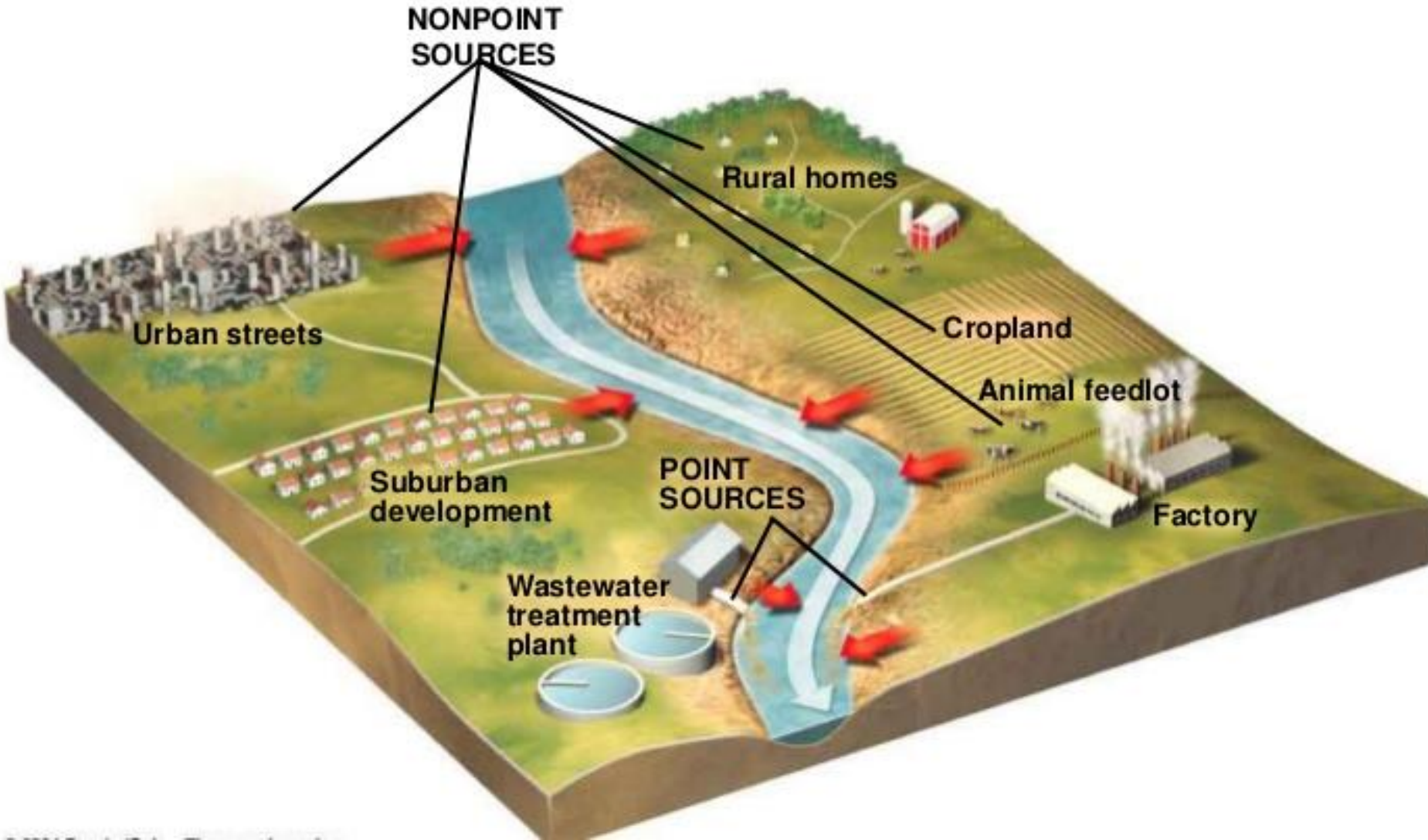
- Rivers act as conduits and carry pollution to any body of water that they drain into, be it an ocean or lake.
- Fresh water is far more easily polluted than our vast oceans, in which currents and tide disperse and dilute the pollution.
- Enclosed systems such as lakes, ponds, and marshes lack the volume of water and are unable to dilute pollutants due to:
    - little vertical mixing
    - little water flow (flushing)
- As a result, the concentration of pollutants/toxins escalate quickly to unsafe levels for all forms of life.
    - (i.e. Kills bottom life, food chain disruptions)

Examples of Source Water Contamination

Below are examples of potential sources of contamination for surface water supplies.



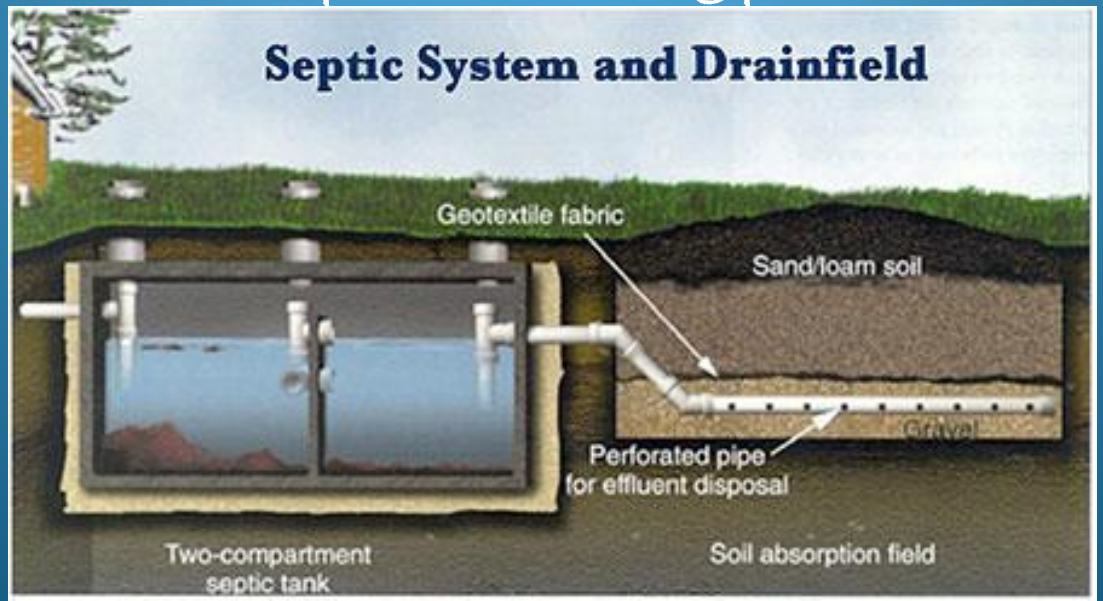
Sources of Water Pollution




WARNING
WATER
POLLUTED
PERSONS BATHING DO
SO AT THEIR OWN RISK
MEDICAL OFFICER OF HEALTH
CITY OF TORONTO

Key Sources of Fresh Water Pollution in Canada

- Septic Tanks: Solid waste is captured by septic tanks but the fluids are flushed through pipes into sand & gravel-lined septic fields
- Aging septic fields sallow raw sewage to seep into the surrounding landscapes.
- Overtime, sewage leaks into drainage ditches, streams, & creeks and become contaminated with toxins entering the food chain.
- In same cases, sewage seeps down into ground water, contaminating drinking water. (remains polluted for long periods of time)



Key Sources of Fresh Water Pollution in Canada

- Storm Drains & Urban Runoff: Takes water away during heavy rains from roadways, parking lots, & subdivisions into creeks, streams, and rivers, who then empty into lakes and oceans.
- This rainwater run-off carries pollution from a variety of sources:
  - Pesticides, herbicides, & fertilizers from farms and back yards.
  - Oil, gas, anti-freeze from vehicles.
  - Toxic exhaust particulates that settle on roadways.
  - Phosphates from soaps used in washing vehicles.

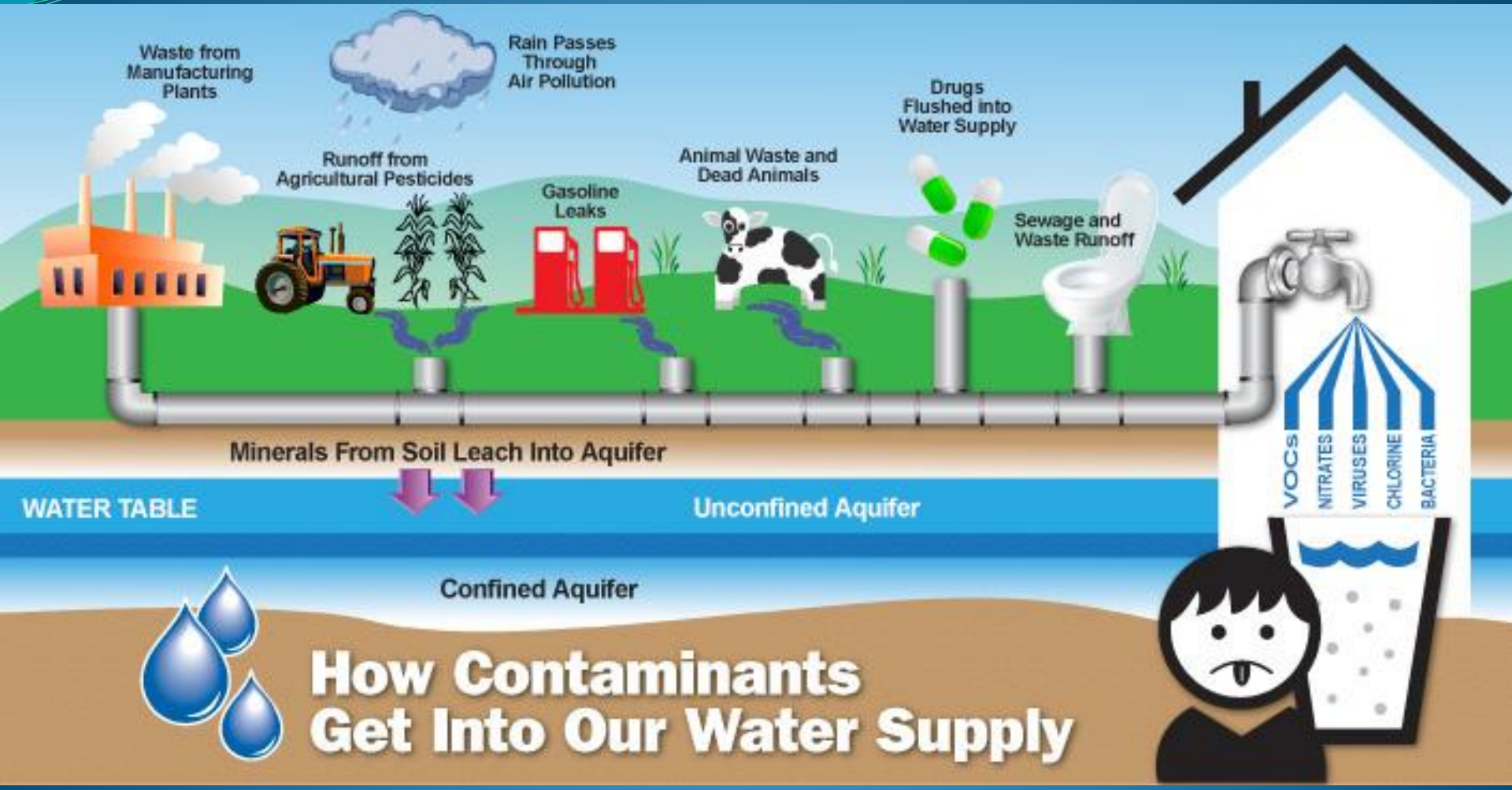
Key Sources of Fresh Water Pollution in Canada

- Mining Operations: Fine mine-tailings, a by-product from the removal of ore, are stored in tailing ponds around mining site.
- This fine material is often contaminated with toxic chemicals used in the extraction process where acids & chemicals are used to separate the ore from the rock
- Waste is intended to be contained in tailing ponds, but can either (a) seep into streams and groundwater, even after a mine has closed, or (b) the ponds can breach causing contaminated waters to flow freely

Mine in Trail, BC

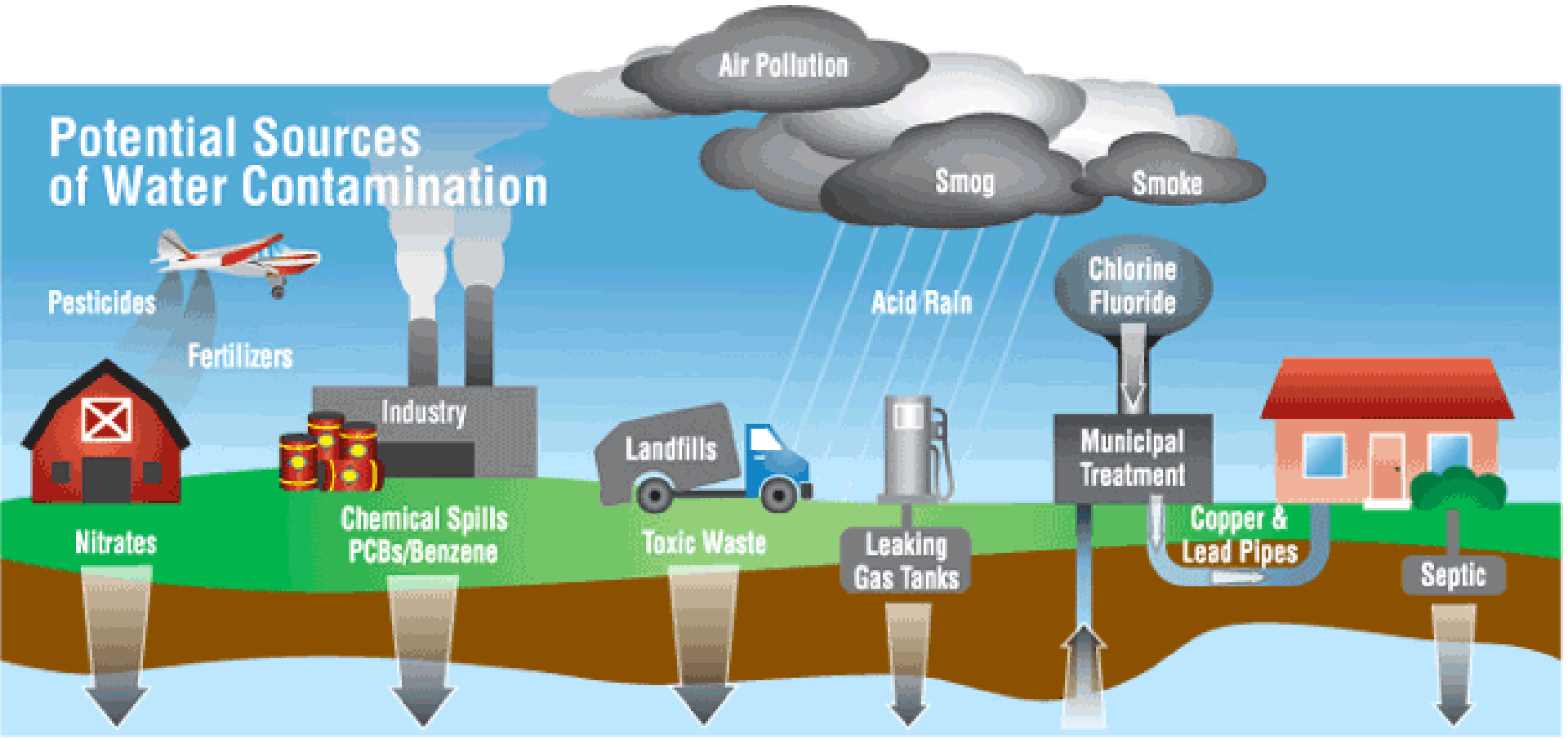
Key Sources of Fresh Water Pollution in Canada

- Clear-cut Logging: in B.C.
- Excessive silt runoff into thousands of streams throughout province.
- Spawning salmon grounds have been destroyed by silt brought down from hillsides stripped bare of vegetation by logging operations.
- Without tree roots to hold soil in place, landslides triggered by heavy rains, block entire streams altering water flow destroying spawning grounds and causing flooding.


Waste from Manufacturing Plants
Rain Passes Through Air Pollution
Drugs Flushed into Water Supply
Runoff from Agricultural Pesticides
Animal Waste and Dead Animals
Gasoline Leaks
Sewage and Waste Runoff
Minerals From Soil Leach Into Aquifer
WATER TABLE
Unconfined Aquifer
Confined Aquifer
VOCs
NITRATES
VIRUSES
CHLORINE
BACTERIA
How Contaminants Get Into Our Water Supply

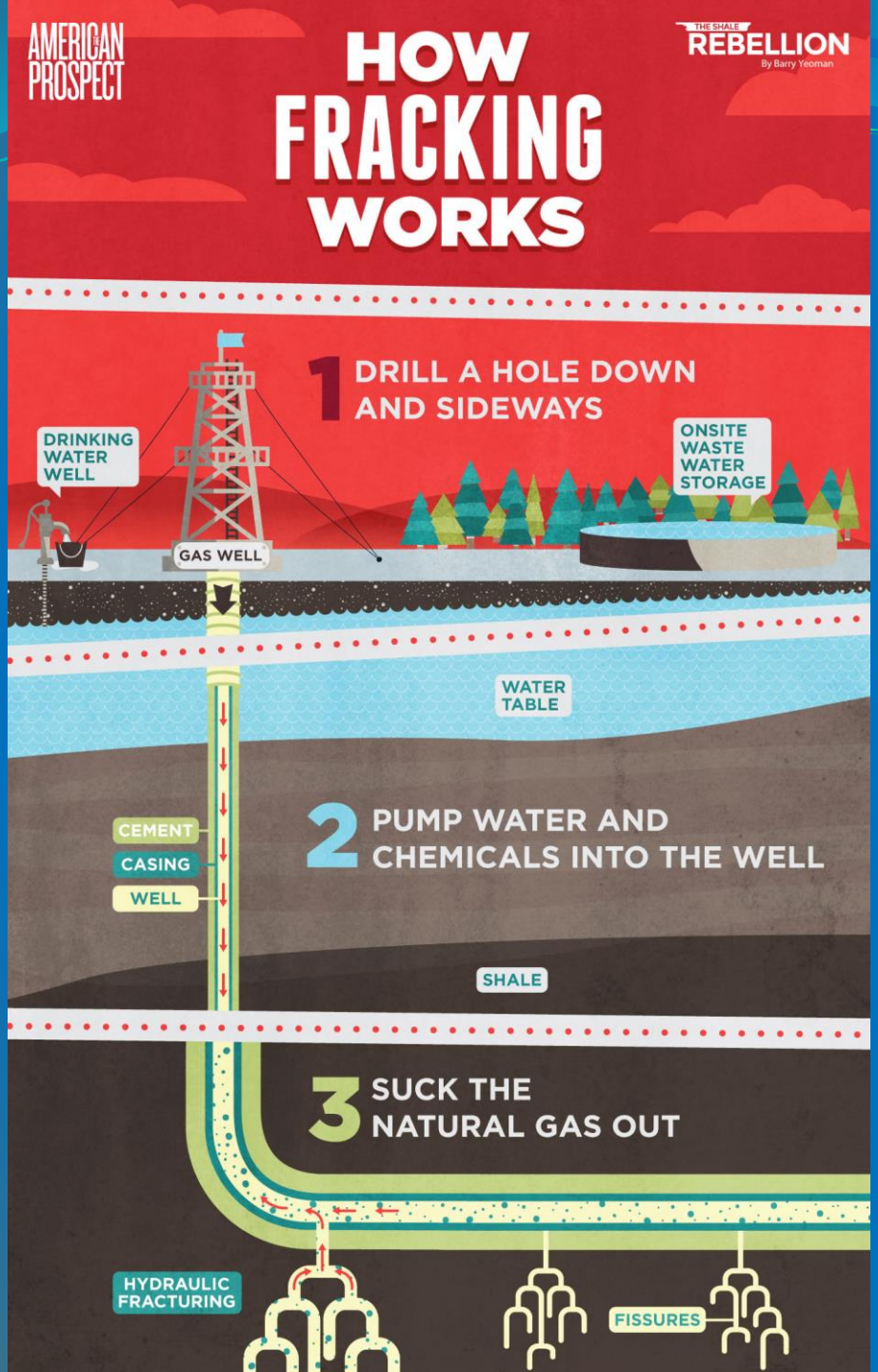
Key Sources of Fresh Water Pollution in Canada

- Poultry Farming in the Fraser Valley
- Chicken and turkey farms are a big industry around Abbotsford.
- Mountains of poultry manure are produced everyday – far more than can be used or treated
- Groundwater sources are now becoming contaminated due to the increase in nitrates from the manure as it leaches into streams, rivers & beyond
- A proposed solution is to process the dung into cattle feed and re-purpose it to cattle farmers. Widely used technique in USA and Quebec


Potential Sources of Water Contamination
Air Pollution
Smog
Smoke
Acid Rain
Chlorine Fluoride
Pesticides
Fertilizers
Industry
Landfills
Municipal Treatment
Nitrates
Chemical Spills PCBs/Benzene
Toxic Waste
Leaking Gas Tanks
Copper & Lead Pipes
Septic

‘Fracking’ in Alberta and beyond

- Uses somewhere between 5 million & 100 million liters of water per well
- Can easily require more than 2,000 truck trips to deliver water
- Water becomes heavily contaminated after the fracking process and must be disposed of somehow — either in tailings ponds or by being injected deep underground
- In Canada, more than 200,000 wells have been horizontally fracked for shale gas or oil
- Recently in Canada there has been a dramatic slowdown in fracking due, in large part, to the drastic drop in oil prices in 2014
  - There are currently 100 active drilling rigs in Alberta, 23 in B.C. and a small amount in Manitoba and Saskatchewan, although numbers fluctuate regularly



- Clip: How Fracking Works