

Hazard Resilience Strategies

Contamination

Air Pollution
Soil Contamination
Water Contamination

Air Pollution

- Ensure stores and offices are encouraged to reduce non-essential use of air conditioners and equipment during off peak hours to reduce power consumption and reduce radiant heat.
- Ensure community-based air pollution awareness/reduction exercises have taken place in the schools and community-at-large (e.g., table-top or full-scale exercises).
- In case of extended poor air quality days, ensure there are plans to allow residents to evacuate to a designated shelter outside of the community.
- Ensure most residents check regularly with weather forecasting agencies such as Environment Canada.
- Ensure most residents have received education regarding air pollution and know strategies to reduce exposure to polluted air, for example by remaining indoors.
- Ensure the community encourages community members and businesses to temporarily stop or reduce their emission of pollutants if there is serious air pollution, such as not driving or reducing vehicle usage.
- Ensure the community encourages increased green spaces, the planting of shade trees and use of light-coloured building and road surfaces.
- Ensure the community has a “no idling” in your vehicle for more than one minute policy.
- Ensure the community has identified “at risk” individuals to air pollution (e.g., those with asthma or elderly).
- Where present, ensure the community encourages and enforces industries to reduce carbon emissions.
- Ensure there is a warning system in place to notify community residents of potential air pollution and associated poor air quality days, including from forest fires.
- Ensure there is a warning system in place to notify emergency response personnel of potential air pollution including from forest fires.

- Ensure there is a warning system in place to notify transient, migrant and other visiting people of potential air pollution including from forest fires.
- Ensure homeless shelters have made provisions for increased capacity, hazard specific conditions and evacuation procedures to other emergency shelters located outside of the community.
- Ensure regulations exist and are enforced to control air pollution in the community.
- Ensure the community has a means through which to consult with Traditional Knowledge holders and subject matter experts about air pollution, natural air quality improvement planning and preventative actions.
- Ensure that the community has a policy to reduce wood-burning or provides residents with tips on wood-burning on an annual basis.
- In British Columbia, your community actively promotes participation in the [Wood Stove Exchange Program](#).

Soil Contamination

- Ensure the community has regular inspections of potential polluting facilities and testing of surrounding soils and enforces compliance.
- Ensure the community has well designed landfills and regularly tests for water contamination seeping from the landfill.
- If levels of contaminants are discovered in soils above baseline levels or at levels that pose risks to public health and the environment, ensure the community has a means to require repairs or adjustments to the pollution source and/or removal of soil contaminants by the polluter, future developer or government.
- Ensure the community has identified and implemented appropriate soil contamination prevention and removal techniques, such as physical barriers that prevent contaminants migrating into groundwater, soil excavation, soil flushing, adding soil amendments, and bioremediation.
- Ensure the community is working with the Department of National Defense to ensure that all chemicals, unexploded ordinances and metals are removed from old military training sites.
- Ensure the community is working with the owners of past and existing firing ranges to ensure that all ammunition and metals are removed from the site by the proper authorities or organizations.
- Ensure the community monitors the number and type of pesticides and fungicides that are used by farmers and encourages eco-sustainable methods of controlling pests.
- Ensure the community prevents soil contamination by controlling the placement of potentially polluting facilities and chemical storage areas through zoning and designations.
- Ensure regular soil testing takes place to protect ecosystem health and preserve groundwater and plant health, including testing community and private gardens.
- Ensure the community regulates the number and type of pesticides and fungicides that can be used by residents and encourages eco-sustainable methods of controlling pests.
- Ensure the community regulates and monitors the number and type of pesticides and fungicides that can be used by nearby farmers and encourages eco-sustainable methods of controlling pests.

- Ensure community zoning and designations effectively identify sensitive and culturally significant areas to preserve and protect species (e.g., medicinal plants), especially species at risk, and the soils in which they grow.
- Ensure the community has a means through which to consult with Traditional Knowledge holders and subject matter experts about soil pollution, appropriate and effective soil quality improvement efforts and prevention of further contamination.
- For sites contaminated through previous activities (e.g., historic waste sites), ensure the community is working with the owners to monitor and remediate those sites.

Water Contamination

- Ensure the community has adequate storm sewage and human sewage treatment systems to prevent water contamination.
- Ensure the community has regular inspections of potential polluting facilities (including agricultural areas) and testing of groundwater and enforces compliance.
- Ensure the community has regular inspections and testing of residential and business septic systems, water retention ponds and cisterns to identify and prevent possible public health risks.
- Ensure the community has well designed landfills and regularly tests for water contamination seeping from the landfill.
- If levels of contaminants are discovered in groundwater above baseline levels or at levels that pose risks to public health and the environment, ensure the community has the means to require repairs or adjustments to the pollution source and/or removal of water contaminants by the polluter, future developer or government.
- Ensure the community has identified and implemented appropriate techniques to remove groundwater contaminants, such as injecting oxygen into the groundwater to speed degradation of organic pollutants, placing porous treatment walls in front of a contaminated plume, or pumping out and treating the groundwater.
- Ensure the community controls or prevents activities that could cause damage to ecosystems and water quality. Ensure the community prevents water contamination by controlling the placement of potentially polluting facilities and chemical storage areas through zoning and designations.
- Ensure there is a warning system in place using various means of communication including social media to notify community residents and visitors of potential boil water and “do not drink” advisories, as well as “no swimming” areas (even when temporary) that result from water contamination or stagnation etc.
- Ensure there is a warning system in place to notify emergency response personnel of potential boil water and “do not drink” advisories.
- Where boil water advisories have been in place for extended periods, ensure the community provides bottled water according to Public Safety Canada’s recommendations (i.e., 4 litres per person per day) AND ensure the community is working to establish a more permanent and safe water supply.
- Ensure community zoning and designations effectively identify sensitive and culturally significant areas to preserve and protect species (e.g., fish, caribou) and the water sources on which they depend.
- Where surface water is known to be, or suspected to be, contaminated (e.g., high levels of mercury), ensure regular monitoring is undertaken and remediation actions are laid out in regulations.

- Ensure the community has a means through which to consult with Traditional Knowledge holders and subject matter experts about water pollution, appropriate and effective water quality improvement efforts and prevention of further contamination.

References

- Akbari, H., Pomerantza, M., & Tahaa, H. (2001). Cool surfaces and shade trees to reduce energy use and improve air quality in urban areas. *Solar Energy*, 70(3), 295-310.
[https://doi.org/10.1016/S0038-092X\(00\)00089-X](https://doi.org/10.1016/S0038-092X(00)00089-X)
- Alberta Environment. (2019). [*Alberta tier 1 soil and groundwater remediation guidelines*](#).
- Ashraf, A. A. M., Maah, J., & Yusoff, I. (2014). [*Soil contamination, risk assessment and remediation*](#). *IntechOpen*. doi: 10.5772/57287
- Canadian Water Network. (2020). [*Summary of insights. Managing risks from contaminants of emerging concern in wastewater*](#).
- Department of Environment, Government of Nunavut. (2014). [*Environmental guideline for the management of contaminated sites*](#).
- Environment Canada. (n.d.). [*Technical Assistance Bulletin #24: Remediation technologies for ground water contamination*](#).
- Gordon, J. A. (2001). [*Risk assessment and management in local government emergency planning*](#). Institute for Catastrophic Loss Reduction.
- Government of Canada. (2017). [*What you can do to improve air quality*](#).
- Government of Canada. (2020). [*Contaminated sites: Services and information*](#).
- Government of Canada. (n.d.). [*Remediation resources*](#).
- Human Rights Watch. (n.d.). [*Make it safe. Canada's obligation to end the First Nations Water Crisis*](#).
- Lombi, E., Wenzel, W. W., & Adriano, D. C. (1998). [*Soil contamination, risk reduction and remediation*](#). *Land Contamination & Reclamation*, 6, 183-19.
- Marshall, R., Desjardine, M. Levison, J., Anderson, K, & McBean, E. (2020). [*Moving towards effective First Nations' source water protection: Barriers, opportunities, and a framework*](#). *Water*, 12, 2957. <https://doi.org/10.3390/w12112957>
- Smoyer-Tomic, K. E., Kuhn, R., & Hudson, A. (2003). Heat wave hazards: An overview of heat wave impacts in Canada. *Natural Hazards*, 28, 463–485.
<https://doi.org/10.1023/A:1022946528157>