BC HOUSING

Extreme Heat and Wildfire Smoke Action Plan

June 2022

Contents

Acknowledgement

BC Housing acknowledges that we deliver our services across the ancestral, traditional, and unceded homelands of hundreds of First Nations, each with their own unique histories, cultures, and traditions. We offer our commitment to working in good relations and to implementing the province's Declaration on the Rights of Indigenous Peoples Act (DRIPA) in all areas of our mandate.

Updates to BC Housing's extreme heat planning and response were initiated following the extreme heat event in Summer 2021. Tragically, during that event 619 people died across the province[1], 54 deaths[2] occurred across 46 BC Housing-funded buildings, including seven sites directly operated by BC Housing. The majority of the 46 buildings are located in the Lower Mainland.

We offer our sincere and heartfelt condolences to all those who lost loved ones or were injured during the heat dome of 2021.

Purpose and Scope

This document provides an overview of key priority areas, short and long-term actions, and timelines to ensure that BC Housing, as an organization, is prepared to support people living in the community housing sector and our partners during extreme heat and wildfire smoke events so that:

- Community housing residents and homeless shelter clients are protected from the adverse effects of these events;
- Non-profit housing providers have access to the tools and resources they may need;
- New construction projects and existing buildings are more resilient to increases in extreme heat and wildfire smoke that are projected in the coming decades; and
- BC Housing evolves its role in supporting sector-wide and community readiness for extreme heat and wildfire smoke events.

While wildfires also pose the additional risk of resident evacuations, that aspect is out of scope for this plan.

[1] https://www2.gov.bc.ca/assets/gov/birth-adoption-death-marriage-and-divorce/deaths/coroners-service/death-review-panel/extreme_heat_death_review_panel_report.pdf

[2] The BC Coroners Service report published on June 7 indicates 62 people died in SRO, social housing and supportive housing sites. BC Housing funds 46 sites where 54 people died. The remaining 8 people died at other sites not funded by BC Housing.

Background

Why We Need to Prepare

While the impacts of a changing climate have been recognized for many years, the 2021 heat dome and associated deaths, along with the uncontrolled wildfires of that same year, made it clear that BC Housing needs strong and effective systems to respond to and prepare for these events which climate projections indicate are going to increase in frequency and severity in the coming years. The World Weather Attribution Initiative, for example, estimates that, with current emissions levels, extreme heat events like the one in 2021 could occur once every 5 to 10 years by the 2040s[3]. Increased summer temperatures also contribute to a longer and more intense wildfire season, with broader geographical impacts.

This Extreme Heat and Wildfire Smoke (EHWS) Action Plan focuses on the health risks from poor air quality due to wildfire smoke, as well as heat related mortality and morbidity for people living in housing, including affordable housing, shelters and the community housing sector more broadly. In June 2022, the BC Coroners Service released a report that identified 619 deaths related to the 2021 heat dome.[4] This is the highest number of fatalities due to a natural disaster in Canadian history. The need to develop protective measures against heat-related death and illness in residential settings is also an imperative to protect some of the most marginalized and vulnerable in our communities as social determinants of health such as poverty, social isolation, disability, mental illness, and substance use, are often exacerbated in a crisis. For example, the majority of those who died as a result of the 2021 heat dome were poor, with disability, living alone and over 55 years old. Low-income people are also more likely to be located in urban heat islands, with less green space and trees and therefore at increased risk for dangerous indoor temperatures.

Actions To-Date

For more than four years, BC Housing has been building internal capacity for Extreme Heat and Wildfire Smoke (EHWS) planning and response. However, the urgency of this work increased dramatically with the extreme heat and wildfire events of summer 2021.

In July 2021, following the heat dome, BC Housing's Executive Committee set up BC Housing's Extreme Heat & Wildfire Smoke Emergency Operations Centre (EOC). The EOC took immediate actions – such as communication with the non-profit housing sector to bolster planning and response efforts, purchasing and distribution of cooling and air purifying equipment (air conditioners, air purifiers and fans), and risk mitigation plans for both new construction and building renovations and upgrades.

In October 2021, the Attorney General and Minister Responsible for Housing requested that BC Housing conduct a review of any possible heat-related deaths and injuries in both BC Housing managed and non-profit managed housing and provide recommendations for improvement. BC Housing received data

[3] https://www.worldweatherattribution.org/western-north-american-extreme-heat-virtually-impossible-without-human-caused-climate-change/

[4] https://www2.gov.bc.ca/assets/gov/birth-adoption-death-marriage-and-divorce/deaths/coroners-service/death-review-panel/extreme_heat_death_review_panel_report.pdf

from the BC Coroners Services at the end of January 2022 upon which detailed analysis was conducted to understand and inform our actions and recommendations (See: *Extreme Heat and Buildings: An Analysis of the 2021 Heat Dome Related Deaths in Community Housing in British Columbia*, June 2022.)

The priority areas for short and longer-term activities to plan and respond to EHWS include:

1. **Increasing capacity within the non-profit housing sector.** Supporting the non-profit sector through educational activities; communication methods, tools, and templates; and resources such as cooling equipment and funding when available.
2. **Building organizational capacity within BC Housing.** Updating existing protocol for Directly Managed housing and developing response protocols for non-profit managed housing (including roles & responsibilities and resources).
3. **Reducing risk of overheating and poor air quality due to wildfire smoke, in new construction and in existing buildings.** Ensuring that building designs and asset management strategies incorporate risks of EHWS, in both new construction and retrofits projects.
4. **Research and Engagement.** Undertaking research and engagement to better understand the needs of tenants and clients, and technical and non-technical solutions for the housing sector.
5. **Collaborating with stakeholders.** Engaging with external stakeholders to identify opportunities to share and leverage learning, resources and supports.

Additional details about each of the priority areas are included below in the Strategic Priorities and Activities section below.

Engagement with Internal and External Partners and Stakeholders

BC Housing has conducted outreach and engagement over the past four years with external stakeholders such as the BC Non-Profit Housing Association (BCNPHA), individual community housing organizations, tenants, health authorities, Emergency Management-BC, and municipalities, and has paid specific attention to the impacts of extreme heat and wildfire smoke on those who are most vulnerable. Internal to BC Housing, work was conducted in partnership with key personnel from branches across the organization to evaluate past and current activities and responses to the EHWS including an analysis of projects both under development and in operations, to strengthen and advance protocols and systems going forward.

Some of the lessons identified from EHWS response efforts in recent years include:

- To enable timely action and reduce duplication of efforts, the following are needed: clarity around roles and decision-making authority, well defined lines of accountability and communication channels at all levels of BC Housing, as well as between BC Housing and our operating partners, and within non-profit housing organizations.
- Tenant supports such as cooling and clean air rooms, instructions and communication efforts to help residents to stay cool and breathe safely, and to inform them about community cooling centres, need to be communicated and provided in ways that are accessible for those with a range of disabilities, are cultural appropriate for Indigenous and racialized communities, provided in languages other than English, and consider safety needs for those who might be fleeing violence or experiencing mental health challenges.

- Early identification of risks and vulnerabilities—ranging from specific buildings to individual residents—enables resources to be allocated and attention to be focused for the people and places where it is most needed.
- Processes and guidelines need to be flexible enough to adapt to the variabilities associated with a diverse range of housing and building types, locations, and housing providers, including differences in neighbourhood characteristics and amenities, organizational structures and capacity, and most critically resident needs and vulnerabilities.
- Special supports, considerations, and planning are needed for non-profit providers, who may not have the resources to pay overtime or make unanticipated purchases during EHWS events.
- Education before the event about extreme weather, risks and protocols, as well as readily accessible information during the event, is essential for the ability of front-line staff to respond appropriately.

Further engagement, especially with people with disabilities and people identified by BCCDC as the most at risk from extreme related illness, is needed in a more strategic and transparent way for the development of the next phase of BC Housing's EHWS Action Plan.

Data Analysis from BC Centre for Disease Control, the BC Coroners Service, and BC Housing

Coroners Service Investigation into 2021 Heat-Related Deaths

The BC Coroners Service has conducted an investigation into the deaths during the 2021 heat dome linked to extreme heat and has provided BC Housing with the list of social housing buildings funded by BC Housing where such deaths occurred. This allowed for specific although limited analysis of key risk factors for social housing. The analysis and findings are presented in a separate BC Housing report: *Extreme Heat and Buildings: An Analysis of the 2021 Heat Dome Related Deaths in Community Housing in British Columbia*, June 2022.

Additional Analysis of 2021 Heat-Related Deaths

Analysis of mortality during BC's extreme heat events of 2021 (June 18 to August 12, 2021) provides important considerations for protective and preventative actions going forward. The following is a summary of key risk factors associated with an increase in heat-related illness and mortality during the extreme heat events of 2021. It is drawn from the BC Coroners Service *Heat-Related Deaths – Knowledge Update*, (Nov. 1, 2021)[5], the BC Centre for Disease Control webinar *Mortality During the*

[5] BC Coroners Service (BCCS), Ministry of Public Safety & Solicitor General, *Heat-Related Deaths – Knowledge Update,* Nov.1, 2021; https://www2.gov.bc.ca/assets/gov/birth-adoption-death-marriage-and-divorce/deaths/coroners-service/statistical/heat_related_deaths_in_bc_knowledge_update.pdf.

Catastrophic 2021 Heat Dome (Nov. 2, 2021)[6] and the *Extreme Heat and Human Mortality: A Review of Heat-Related Deaths in B.C. in Summer 2021* (Jun. 7, 2022)[7].

Built Environment Risk Factors

98% of heat-related deaths in BC in 2021 occurred inside a residence. The indoor temperature can often be higher than the outdoor temperature during extreme heat events. Many buildings do not cool down at night and the indoor heat continues to rise due to a compounding effect that comes from each additional hot day.

- Cooling: Key risk factor as identified by the BC Coroners is a lack of air conditioning in residential units.
- Solar heat gain: buildings that allow for a high-level of solar heat gain through windows due to window type or building orientation are at higher risk of overheating.
- Inadequate air ventilation and air distribution systems that are not maximized to provide passive cooling in individual units contribute to higher indoor temperatures.
- Urban Heat Island: buildings located in urban settings with dense concentrations of pavement, buildings, and other hard surfaces that absorb and retain heat experience significantly higher temperatures than buildings located in open, green spaces.
- No easy and near access to green spaces. BCCDC determined that most of the deaths occurred in buildings that were 100meters or more away from green space.
- Lack of passive cooling measures such as external shading.

BCCDC Risks Factors

The following have been identified by the BCCDC as risk factors that contribute to heat related illness and mortality.

- Social isolation
- Age: 67% of heat-related deaths in BC in 2021 occurred in people over the age of 70
- Mental health: Schizophrenia was associated with a 4-5 times higher risk, substance use disorder, depression and mood anxiety disorders were also associated with higher risk
- Building characteristics: Lack of cooling (passive and mechanical), ventilation, and window coverings
- Heat islands/geographic location: a 5% increase in tree cover within a 100 meter radius of a site is associated with a 9% reduction in extreme heat risk (all other things being equal)

Geographic Trends

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[6] ***Mortality during the catastrophic 2021 heat dome,* Webinar (Nov. 2, 2021), BC Centre for Disease Control. Presenter: Dr. Sarah Henderson; https://nexuswebcast.mediasite.com/Mediasite/Showcase/bc-cdc-showcase.

[7] BC Coroners Service (BCCS), Ministry of Public Safety & Solicitor General, *Extreme Heat and Human Mortality: A Review of Heat-Related Deaths in B.C. in Summer 2021*, Jun. 7, 2022; https://www2.gov.bc.ca/assets/gov/birth-adoption-death-marriage-and-divorce/deaths/coroners-service/death-review-panel/extreme_heat_death_review_panel_report.pdf

According to the BC Coroners Service's Knowledge Update, fifty-one percent (51%) of heat-related deaths occurred in the Fraser Health Authority region, followed by Vancouver Coastal Health region (23%). The three townships that experienced the highest number of deaths are Vancouver (117 deaths), Surrey (75 deaths), and Burnaby (73 deaths).

Indoor temperatures and heat-related illness and mortality

The BCCDC webinar noted that heat-related deaths and illness are the result of high indoor temperatures, which follow peak outdoor temperatures. Because indoor temperatures do not drop in the evenings as occurs outdoors, each day begins with a higher baseline than the day before it. This leads to a cumulative increase in indoor temperatures during extended heat waves. This aligns with the Coroner's Services findings which indicated that some of the 2021 deaths occurred in the days after those with the highest temperatures.

Extreme Heat & Wildfire Smoke (EHWS) Response: Strategic Priorities and Activity Areas

The following priorities and key activities are designed to work as components of a comprehensive strategy to prevent extreme heat and wildfire smoke related illness and death among resident populations within the community housing sector and emergency shelter system, paying particular attention to people who are most vulnerable and from equity-denied groups. The priorities are organized in the following areas:

1. **Increasing capacity within the non-profit housing sector.**
2. **Building organizational capacity within BC Housing.**
3. **Reducing risk of overheating and poor air quality due to wildfire smoke, in new construction and in existing buildings.**
4. **Research and Engagement.**
5. **Collaborating with stakeholders.**

The tables below present more details in each of the five areas.

1. Increasing capacity within the non-profit housing sector Supporting the non-profit sector through educational activities; communication methods, tools, and templates; and resources such as cooling equipment.		
Activity	**Key Dates**	**Status**
Short-term		
1. Offer workshops on how to create an EHWS Response plan at BCNPHA RENT sessions in spring 2022; in collaboration with Medical Health Officers from each region.	Spring 2022	Workshops offered in Nanaimo & New Westminster. Prince George scheduled for June

2. Host a webinar for the Non-profit housing sector in collaboration with BCNPHA and Vancouver Coastal Health, including presentations from a medical health officer and three different non-profit housing and shelter providers.	April 28, 2022	Completed. Recording available at BC Housing's & BCNPHA websites
3. Develop communication and training plan for BC Housing staff and Non-profit housing providers.	Spring and Summer 2022	Completed. Implementation in progress
4. Develop resources enabling the Non-profit housing providers to conduct their own high-level cooling audits of their buildings.	Spring 2022	On track
5. Procure, store and manage of an inventory of cooling and air purifying items (such as portable AC units, air purifiers, fans and others).	Spring and Summer 2022	On track. Emergency inventory in place. Non-profits are encouraged to purchase their own equipment with funding support from BCH
6. Communicate details on management and distribution of the inventory of cooling items to the non-profit sector.	Spring & summer 2022	On track
7. Develop IT solution/online form for Non-profit housing providers to request items from BC Housing.	Spring 2022	Completed
8. Review and update all tenant communication materials based on feedback received from vulnerable people and equity seeking groups.	Spring 2022	On track
Long-term		
9. Provide easy access to existing documents, tools, communication materials and resources available for the frontline staff within BCH and community sector organizations.	Spring 2022	On track
10. On-going collaboration with EMBC, Health Authorities (including BC HEAT Committee) and key municipalities on their Heat Alert and Response Systems (HARS).	On-going	On track
11. Develop an internal and external Communications plan.	Winter 2021/spring 2022	Completed
12. Within the BC Housing Operational Review process, require inclusion of an EHWS preparedness plans for non-profit housing partners.	Spring/summer 2022	On track

2. Building Organizational Capacity for EHWS Emergency Response within BC Housing Updating existing protocol for Directly Managed housing and developing response protocols for non-profit managed housing (including roles & responsibilities and resources).		
Activity	**Key Dates**	**Status**
Short-term		

1. Updating *The Extreme Heat and Wildfire Smoke Emergency Response Protocol for Directly Managed Buildings* across the province.	March 2022	Completed. The updated protocol includes distribution of portable cooling equipment; updated tip sheets translated as needed; resident info sessions; application of window tint to reduce solar heat gains.
2. Developing *The Extreme Heat and Wildfire Smoke Emergency Response Protocol* for supporting the non-profit housing providers.	Spring 2022	In development. Final protocol expected in July 2022.
3. Establishment of the EHWS Emergency Operations Centre with corresponding action items and delegated authority.	July 2021	Completed. Revised based on the new EHWS Action plan
4. Clarifying roles and responsibilities within BC Housing, including processes for ordering, tracking, and storing equipment.	Spring 2022	Completed
5. Training and education.	Spring/summer 2022	On track
Long-Term		
6. Annual post-summer evaluation and updates of the planning and response protocol focusing on equity-denied and vulnerable groups, costs tracking, demands on staff and resources, innovative solutions for tapping into community resources, etc.	Fall 2022	On track
7. Roll out of the new Operations Review requirement for non-profit housing operators to have an EHWS Emergency Response Plans.	Fall 2022	On track
8. Identifying separate budget allocations for EHWS.	Fall 2022	On track

3. Reducing risk of overheating and poor air quality due to wildfire smoke, in new construction and existing buildings

Ensuring that building designs and asset management strategies incorporate risks of EHWS, in both new construction and retrofits projects.

Activity	Key Dates	Status
Short-term		
1. Consider the risks of overheating and poor air quality due to wildfires on new construction projects, including:	Initiated and ongoing	On track

• review of all projects under development to assess their current cooling strategies (active, portable, and passive) • all renovation and development projects submitted for ExCom approval to include a section titled "Extreme Heat & Smoke Response"		
2. Incorporating cooling measures as a requirement into building upgrades and retrofits paying particular attention to passive elements.	Ongoing	On track. Cooling was assigned higher priority in asset management
3. Providing training to BCH Development and Asset Strategies staff and sector partners on the risks of overheating and possible solutions.	Ongoing	Webinar for staff held in January 2022. Other sessions to be scheduled
4. Updates of BC Housing Design Guidelines and Construction Standards pertaining to: • Requirements related to passive cooling measures and addressing the risks of overheating • Considerations of future climate projections in building design (e.g. use of future climate files in energy modelling) • Requiring an adequate (HEPA or MERV 13+) filtration during a poor air quality due to wildfire smoke events. Construction Services, immediate and on-going	Spring 2022	On track. Several studies were completed to inform the update. Update scheduled for June 2022
5. Identify most effective, low-carbon, resilient technical solutions.	Spring 2022	Completed
6. Develop resilient buildings screening (risk assessment) tool – Phase 1.	Spring 2022	Completed
Long-Term		
7. Identify most effective, low-carbon, resilient technical solutions for cooling and air filtration. Phase 2.	Fall 2022	On track
8. Provide training to BCH Development and Asset Strategies staff and construction sector partners (i.e. design and development consultants) on the risks of overheating and possible solutions.	Ongoing	On track. New session scheduled for June 2022
9. Develop resilient buildings screening (risk assessment) tool. Phase 2.	March 2023	On track
10. Pilot existing risk assessment tools (MBAR/IBAMA) on new constructions and existing building projects.	Ongoing	2 new construction pilots in progress. Work in development for existing buildings.
11.Conduct portfolio level climate change risk assessment and integrate it into the capital planning process and construction standards. Phase 1.	March 2023	On track

4. Research and Engagement

Undertaking research and engagement to better understand the needs of the tenants and clients, and solutions for the housing sector, and to ensure continuous improvement of responses over time.

Activity	Key Dates	Status
Short-term		
1. Survey of non-profit housing providers to understand the needs of the sector, in collaboration with BCNPHA.	Spring 2022	Completed
2. Analysis of the data from the coroner's office on deaths in social housing during the heat dome of 2021.	Spring 2022	Completed
3. Research on indoor air temperatures during extreme heat, led by the University of Waterloo. Summer 2022 monitoring, Fall 2022 evaluation.	Fall 2022	On track
4. Develop and implement an engagement plan with tenants and people with lived experience.	March 2023	On track
5. Student research on policy options for responding to extreme heat and poor air quality due to wildfire smoke for the non-profit housing sector, led by Simon Fraser University.	Spring 2022	Completed
6. Technical research of cooling solutions and air filtration.	April 2022	Completed
7. Air filtration systems research.	Spring 2022	Completed
8. Resilient building standard research - phase 1.	Spring 2022	Completed
9. Provide recommendations to the Ministry of the Attorney General and Responsible for Housing.	2022 (various dates)	On going
Long-Term		
10. Set-up a post-summer evaluation process of the effectiveness of this response protocol informed by mortality and morbidity data from health organizations and Coroners Services, EDIB and best practices.	Fall 2022	On track
11. Develop resilient building standards – Phase 2.	Fall 2022	On track
12. Create a research plan specific to EHWS needs.	Winter 2022	On track

5. Collaborating with stakeholders

Engaging with external stakeholders to identify opportunities to share and leverage learning, resources and supports.

Activity	Key Dates	Status
Short-term		
1. Bi-weekly meetings with the BC Health Effects of Anomalous Temperatures (BC HEAT) Coordinating Committee.	On-going	On track
2. Monthly meetings with City of Vancouver, more frequent starting in May.	On-going	On track
3. Advisory relationships with BC CDC and Medical Health Officers.	On-going	On track
4. BC Extreme Heat Framework Working Group led by EMBC.	On-going	On track
Long-Term		
5.Engagement with other municipalities to support social housing tenants and unhoused populations.	On-going	On track

6. Set-up communication channels for feedback for people with lived experience.	Summer 2022	On track

Executive Leads on Extreme Heat and Wildfire Smoke Response

Executive Accountability Areas	Position
- **Overall Coordination & Response** - **Research** - **Collaboration and Engagement**	VP Strategic Business Operations and Performance
- **Reducing Risk in New Construction and Existing Buildings**	VP Development and Asset Strategies
- **Increasing Capacity in the non-profit affordable housing sector;** - **Build Organizational Capacity for EHWS Emergency Response within BCH Directly Managed Portfolio**	VP Operations
- **Communications** - **Collaboration and Engagement**	VP Communications
- **Financial Accountability**	VP Corporate Services and Chief Financial Officer

Planning and Response Annual Cycle

Time	Key Activities
September -December	Internal BCH Planning Activities, Research
Jan – March	Engagement, Development & Approval the Emergency Response Protocol, Purchase of 'Cooling Items' Inventory, Research, Update of BCH Design Guidelines & Construction Standards
April-May	Emergency Response Plan Roll-out
May – September	Emergency Response Implementation
September – March & ongoing	Response Plan Evaluation and Updates