The Corporation of the City of Courtenay

Briefing Note

To: Council **File No.:** 5335-20

From: Director of Infrastructure and Environmental Engineering **Date:** February 12, 2025

Subject: Air Quality Update

PURPOSE: To update Council on air quality within the community, and initiatives to address resident concerns.

BACKGROUND:

The City of Courtenay enjoys good air quality, except during winter nights and times of wildfire smoke. Concerns about air quality in the region are longstanding, and have been raised by residents, Island Health, and the Ministry of the Environment. It is the community vision for the Comox Valley to have clean and healthy air all year round, for current and future generations, as described in the Regional Airshed Protection Strategy.

Work to understand the sources of poor air quality, and the options to improve air quality have been underway for many years, and represent a collaboration between numerous organizations and project partners. Measurements from the provincial air monitoring station indicate that fine particulate matter (also known as $PM_{2.5}$) is responsible for local air quality issues. Fine particulate matter is a key component of wood smoke and it is small enough to inhale, travel through our bloodstream, and cause a range of health problems. Island Health advises that $PM_{2.5}$ can cause eye and throat irritation, and may aggravate respiratory and heart illnesses. They further advise that all types of smoke have similar impacts to cigarette smoke.

In the City of Courtenay, the predominant source of $PM_{2.5}$ is residential wood burning appliances. This was determined by observing the pattern and timing of elevated concentrations of fine particulate matter. Concentrations of $PM_{2.5}$ are highest during winter evenings, as seen in the average monthly and hourly readings collected by the provincial air monitoring station. This pattern aligns with the usage of wood burning appliances in the community. Poor atmospheric venting conditions often occur at night, which traps smoke close to the ground and further worsens air quality.

The City of Courtenay has been working to improve air quality by: installing additional air quality monitors, updating bylaws, hosting an annual public education campaign and collaborating regionally. Updates on each of these initiatives is described below.

DISCUSSION:

PurpleAir Monitors

The City partnered with School District 71 to install PurpleAir Monitors on public buildings across the City. PurpleAir monitors report real time readings of fine particulate matter on an online map. By increasing the number of monitoring locations, the public can observe how concentrations of $PM_{2.5}$ vary across the region, at different times of day. The City of Courtenay maintains nine PurpleAir monitoring locations and additional air monitors have been installed by residents, local government, and community organizations. Currently there are more than 20 monitoring locations in the Comox Valley.

The BC Ministry of Environment endorses the use of PurpleAir monitors and has created data management tools to include measurements from these devices in the provincial air monitoring dataset. Data collected

from these monitors is used by the province to issue air quality advisories. The data collected from these monitors cannot be evaluated against the BC Air Quality Objectives without a correction factor applied because the monitors are sensitive to humidity. For this reason, the monitors are best at providing information about relative air quality in different neighbourhoods within the region.

Bylaws Update

The City updated the Prevention of Public Nuisances Bylaw No. 2804 to regulate nuisance smoke. Nuisance smoke is defined as smoke that visibly drifts onto an adjacent property; interferes with a person's use and enjoyment of privately owned real property; or smoke that interferes with a person's use or enjoyment of public property including sidewalks, roadways, and parks.

Persistent smoke that meets these criteria, is considered a nuisance. Bylaw Enforcement works with residents to seek voluntary compliance, with enforcement measures used in cases of continued non-compliance.

Public Education Campaign

The City of Courtenay has been running an annual public education campaign for the past couple of winters. The campaign first launched in Winter 2023, continued from Fall 2023 to Winter 2024, and recently launched again in Winter 2025. The education campaign includes information on the city website, along with digital and newspaper advertisements.

The objective of the campaign is to make residents aware of the causes of poor air quality, and the opportunities to improve local air quality. This includes information about $PM_{2.5}$ emitted from different heat sources, the rebates available for home heating upgrades, and how to achieve compliance with City of Courtenay nuisance bylaws.

Collaborate Regionally

The City of Courtenay has been collaborating regionally to improve air quality. The City participated as a steering committee member in the development of the Regional Airshed Protection Strategy, led by the Comox Valley Regional District. Since the strategy was published in 2023, the City has worked to implement recommendations within the municipal boundary, and has offered guidance to other local governments within the region. The Regional Airshed Protection Strategy is provided in Attachment 2.

Provincial Air Monitoring Data

The provincial air monitoring station has been measuring fine particulate matter since 2011, and measurements from this station can be evaluated against the BC Air Quality Objectives (AQO). The last ten years of data from this station are presented in Attachment 3. Instruments at this monitoring station are carefully calibrated, and the data is verified by the province. For these reasons, this monitoring station provides the most accurate and long-term perspective on air quality within the region.

Key findings:

- The graph of month averages indicates that concentrations of $PM_{2.5}$ above the annual BC AQO of 8 $\mu g/m^3$ occur during the winter from October to March each year.
- A daily increase in fine particulate matter above the AQO is observed during winter evenings, as seen in the graph of hourly averages.
- Air quality is generally good during winter afternoons, when atmospheric venting conditions are good and smoke trapped from the previous night has had a chance to clear.
- Winter wood burning has a greater impact on air quality than wildfire smoke, which occurs less frequently. This is seen in the monthly average of $PM_{2.5}$, where smoke from wildfires is responsible

for an increase in $PM_{2.5}$ in July and August, and these averages are much less than the average $PM_{2.5}$ over the winter months.

- A trend of average air quality improvement started in 2017, and the objectives were met for the first time in 2019. This trend of improvement continues year over year.

In follow-up discussions with the province, it was noted that this ongoing trend of average air quality improvement seems to be unique to the Comox Valley. For example, air monitoring data from the Cowichan Valley shows an increase in $PM_{2.5}$ concentrations following the COVID -19 pandemic. This suggests local efforts to improve air quality are working.

Going forward, air quality will continue to be evaluated by the provincial air monitoring station, and local efforts to improve air quality will focus on reducing smoke during winter evenings.

FINANCIAL IMPLICATIONS:

There are no new financial implications at this time. Operations and maintenance costs for the PurpleAir monitors, and the annual public education campaign are covered by the Infrastructure and Environmental Engineering general operating budget which has a proposed value of $33,000 for 2025.

ADMINISTRATIVE IMPLICATIONS:

Infrastructure and Environmental Engineering has led initiatives to improve air quality with support from Information Technology, Communications, Operations, Legislative Services, Bylaw, the Province of BC, and external consultants. Regional initiatives and provincial programs have been led by the Comox Valley Regional District.

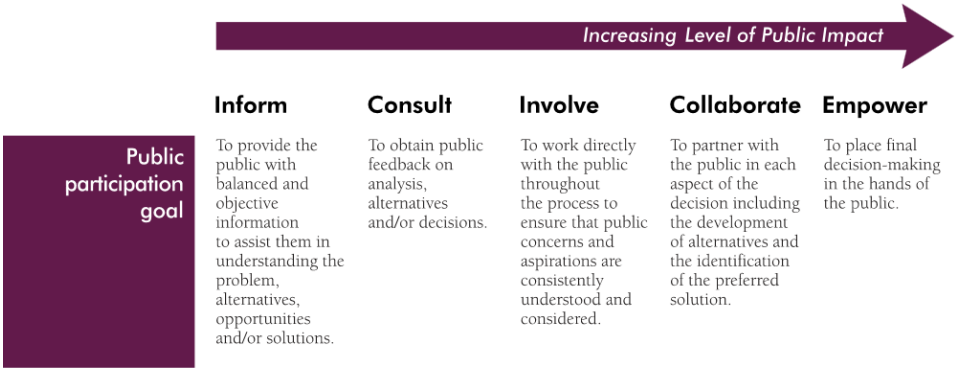
STRATEGIC PRIORITIES REFERENCE:

This initiative addresses the following strategic priorities:

- Social Infrastructure - Develop measures and criteria to track progress for the OCP's four cardinal directions: reconciliation, community well-being, equity, and climate action
- Good Governance - Explore and establish a partnership approach with SD71 on mutual interest topics: active travel and traffic planning, shared facilities, community use of schools, climate, reconciliation, child care and youth engagement

PUBLIC ENGAGEMENT:

Staff collaborate with the public to improve air quality, and inform them of the monitoring results, based on the IAP2 Spectrum of Public Participation:



RECOMMENDATION: THAT Council receive the “Air Quality Update” briefing note.

ATTACHMENTS:
1. Presentation – Air Quality Update
2. Regional Airshed Protection Strategy
3. Provincial Air Quality Data (2014-2023)

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