

December 6th, 2021

NORTH COAST CREMATION SERVICES
7006 Lake Kathryn Rd
Smithers, BC V0J 2N2

To the attention of Ms. Laurel Menzel;

**SUBJECT: AIR DISPERSION MODEL TO SET HEIGHT OF STACK AND SETBACK
Pyrox File # P214005**

Dear Mrs. Menzel,

Thank you for considering Pyrox industry-leading cremation equipment. The Retort Pyrox X1000 has been designed for human cremation only. The unit is gas fired, equipped with a primary burner rated 750 000 BTU and a secondary burner rated at 1.5 MBTU, discharging into the air at a nominal volumetric flow rate of 1.52 actual cubic meters per second through a stack, having an exit diameter of 50.8 cm. Maximum load capacity of the unit is 500 lbs and is rated 150-175 lbs/hr. All Pyrox units are entirely manufactured in Canada using CSA compliant components. Furthermore, our units are designed in accordance with the recommendations of the Canadian Council of the Ministry of the Environment (MOE) and meet all Canadian norms.

In Alberta and British Columbia, there isn't regulations regarding the height of stack above the roof and a minimum setback between the stack the property lines. However, Pyrox's engineer can calculate and document the proper setback and height of stack. Pyrox use a screening air dispersion model for the U.S. EPA, SCREEN3. The SCREEN3 model can be used to estimate worst-case ground level concentrations for a single source as well as concentrations in the cavity zone, and concentrations due to inversion break-up and shoreline fumigation.

In most Canadian provinces, total particles are regulated at points of impingement (POI) for an 24-hour averages. The POI criteria is 120µg/m3. Some provinces such as Québec, an initial concentration of total particles of 90µg/m3 is added to the highest

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Pyrox File # P214005-V3

projected concentrations of contaminants given by the air dispersion model. The Canadian limit is 80% of the POI criteria $120\mu\text{g}/\text{m}^3$, thus $96\mu\text{g}/\text{m}^3$.

As the new cremation equipment are very performant, the expected 24-average concentration of total particles would be very low. Here is the air dispersion modelling based on the proposed site on Powell Street.

Conditions:

Building dimension of 30ft x 40ft

Building height of 22ft

Stack height 30ft from ground (8ft above roof)

Stack inside dimension of 0.508m

Max emission rate of 0.02734 g/s

Stack exit velocity fo 4.6m/s

Emission Summary Table:

Distance to POI	Maximum Concentration	$C_{\text{daily}} = C_{\text{MAX-H}} \times 0,24$	24h - Concentration	Initial Conc.	Total POI Conc.	% of Criteria $120\mu\text{g}/\text{m}^3$
m	$\mu\text{g}/\text{m}^3$		$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	%
20	0.00	0.24	0.00	90.00	90.00	75.0%
30	0.00	0.24	0.00	90.00	90.00	75.0%
40	22.48	0.24	5.40	90.00	95.40	79.5%
50	23.95	0.24	5.75	90.00	95.75	79.8%
60	23.79	0.24	5.71	90.00	95.71	79.8%
70	22.72	0.24	5.45	90.00	95.45	79.5%
80	21.69	0.24	5.21	90.00	95.21	79.3%
90	17.45	0.24	4.19	90.00	94.19	78.5%
100	14.20	0.24	3.41	90.00	93.41	77.8%
200	11.68	0.24	2.80	90.00	92.80	77.3%
300	8.09	0.24	1.94	90.00	91.94	76.6%
400	6.05	0.24	1.45	90.00	91.45	76.2%
500	4.79	0.24	1.15	90.00	91.15	76.0%
600	3.94	0.24	0.95	90.00	90.95	75.8%
700	3.38	0.24	0.81	90.00	90.81	75.7%
800	2.96	0.24	0.71	90.00	90.71	75.6%
900	2.58	0.24	0.62	90.00	90.62	75.5%
1000	2.28	0.24	0.55	90.00	90.55	75.5%

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Conclusion:

All the results are below 80% of the total particles even with the initial concentration of $90\mu\text{g}/\text{m}^3$ added to the total.

Note that in Ontario, the initial concentration of $90\mu\text{g}/\text{m}^3$ is not added to results. In this situation, results would have been between 0.0027% to 0.016% of the $120\mu\text{g}/\text{m}^3$ criteria.

Those results are specific to the site on Powell Street with the given conditions.

We remain available for any additional information, you may need. Thank you for considering Canadian designed and built Pyrox retorts.

Respectfully,



Sébastien Litalien, P.Eng.
General Manager
Pyrox Industries Inc.