



**DISCLAIMER – The data regarding number of inhalers purchased provincially and at Island Health is confidential and has been edited with fictional numbers to illustrate the environmental impact analysis.**

**Executive Summary**

<p><b>Situation</b></p>	<p>Climate change poses significant risk to the health of British Columbians. Metered-dose inhalers (MDI) contribute disproportionately to the carbon footprint of health care facilities in BC.</p>
<p><b>Background</b></p>	<p>MDIs contain hydrofluoroalkane (HFA), a potent greenhouse gas (GHG) that expels medication from the cannister with each actuation. The carbon footprint of an MDI device varies greatly depending on the volume of HFA it contains.</p> <p>PHSA purchased 100,000<sup>α</sup> salbutamol MDIs for 2021-2022 fiscal; of those, Island Health purchased 10,000<sup>α</sup>. PHSA currently contracts a low-volume HFA MDI provider which has substantially lower GHG emissions than high-volume HFA MDIs.</p> <p>The Request for Proposals for salbutamol MDI re-negotiation presents an opportunity to review the climate impact of inpatient inhaler use at PHSA.</p>
<p><b>Assessment</b></p>	<p>Changing to a high-volume HFA MDI provider would result in a <b>net increase of 1,848<sup>α</sup> tonnes CO2e</b> yearly provincially which represents a <b>290% increase</b> in the carbon footprint of salbutamol inhalers provincially. This is equivalent to driving 7.4<sup>α</sup> million kilometers in a gasoline-powered vehicle.</p> <p>Within Island Health, this change would result in a net increase of 185<sup>α</sup> tonnes CO2e per year. This is <b>equivalent to 35%<sup>α</sup> of the emissions from Island Health’s vehicle fleet.</b></p>
<p><b>Recommendations</b></p>	<ol style="list-style-type: none"> <li>1. We recommend reviewing the carbon intensity of the different salbutamol MDI options as part of the decision-making process for awarding the inhaler contract.</li> <li>2. We recommend weighing the climate impact of decisions made for future contract negotiation and Requests for Proposals.</li> </ol>

<sup>α</sup> Due to the confidential nature of this data, we have used fictitious numbers to illustrate how we conducted the environmental impact analysis.

# Salbutamol Metered Dose Inhaler PHSA Negotiation & Environmental Impact

Prepared for Director of Pharmacy, Purchasing Supervisor

---

## Situation

Climate change poses significant risk to the health of British Columbians. Island Health's Strategic Framework prioritizes action on climate change.<sup>1</sup>

Metered-dose inhalers (MDI), including salbutamol, contribute disproportionately to the carbon footprint of health care facilities in BC. Negotiations related to PHSA's contract for salbutamol MDI are underway; the decision on this negotiation has climate implications. This briefing note outlines the potential environmental ramifications of the decision and provides recommendations.

## Background

The health of British Columbians has been affected by climate events with increasing frequency. Critical climate events are related to increased healthcare utilization including increased primary care visits,<sup>2,3</sup> increased emergency visits,<sup>4</sup> increased hospitalizations,<sup>5,6</sup> increased respiratory infections<sup>7</sup> and increased mortality for patients with chronic respiratory disease.<sup>7,8</sup>

Health Authorities have made environmental stewardship and climate resilience a priority,<sup>1,13</sup> which is increasingly important because healthcare itself is very carbon intensive; 4.6% of Canada's greenhouse gas (GHG) emissions are directly related to healthcare delivery.<sup>9</sup> Nearly a quarter of these emissions are directly related to pharmaceutical products which represents the single largest expenditure category.<sup>9</sup>

Within this category, inhalers deserve special mention. Metered-dose inhalers (MDIs) contain hydrofluoroalkane (HFA), a potent GHG that expels medication from the canister with each actuation. The carbon intensity of an MDI varies significantly with the volume of HFA from the manufacturer, even within the same device type and active ingredient. A low-volume HFA salbutamol MDI contains the GHG equivalent of driving 38.8 km in a standard gasoline powered vehicle, while a high-volume MDI can be up to 290 km by car.<sup>10,11</sup>

Because of their outsized environmental impact, MDIs are an easy target for intervention to decrease our healthcare-related carbon footprint. The Critical Air Project is a climate-conscious prescribing initiative based at Island Health whose mandate is to decrease healthcare-related GHG emissions through an evidence-based quality improvement framework.

During the 2021-2022 fiscal year, PHSA inpatient facilities purchased 100,000<sup>α</sup> salbutamol MDIs; of those, Island Health purchased 10,000<sup>α</sup>. Salbutamol MDIs represent 30%<sup>α</sup> of all inhalers purchased provincially.

<sup>α</sup> Due to the confidential nature of this data, we have used fictitious numbers to illustrate how we conducted the environmental impact analysis.

# Salbutamol Metered Dose Inhaler PHSA Negotiation & Environmental Impact

Prepared for Director of Pharmacy, Purchasing Supervisor

The current PHSA contract is with a low-volume HFA MDI provider. Each low-volume HFA MDI has the GHG equivalent of 9,720g CO<sub>2</sub>e, which is equivalent to driving 38.8km in a standard gasoline-powered vehicle.<sup>10,11</sup> The current yearly carbon footprint for salbutamol MDIs provincially is 972<sup>α</sup> tonnes CO<sub>2</sub>e and 97.2<sup>α</sup> tonnes CO<sub>2</sub>e at Island Health (see Table 1).

	PHSA	Island Health
Number of salbutamol MDIs purchased during 2021-2022 <sup>11</sup>	100,000 <sup>α</sup>	10,000 <sup>α</sup>
Carbon footprint per low-volume HFA salbutamol MDI (kgCO <sub>2</sub> e) <sup>9,10</sup>	9,720 gCO <sub>2</sub> e	9,720 gCO <sub>2</sub> e
Carbon footprint per low volume HFA salbutamol MDI (km by car) <sup>9,10</sup>	38.8 km	38.8 km
*Yearly carbon footprint low-volume HFA salbutamol MDI (tCO <sub>2</sub> e)	972 <sup>α</sup> tCO <sub>2</sub> e	97.2 <sup>α</sup> tCO <sub>2</sub> e
**Yearly carbon footprint low-volume HFA salbutamol MDI (km by car)	3,880,000 <sup>α</sup> km	388,000 <sup>α</sup> km

Table 1: Current state of salbutamol MDI carbon footprint

## Provincial GHG emission estimates of changing from low-volume HFA MDI to high-volume HFA MDI

Each high-volume HFA salbutamol MDI has the GHG equivalent of 28,200 gCO<sub>2</sub>e, which is equivalent to driving 112.6 km in a standard gasoline-powered vehicle (see Table 2).<sup>10,11</sup>

	PHSA	Island Health
Number of salbutamol MDIs purchased during 2021-2022 <sup>12</sup>	100,000 <sup>α</sup>	10,000 <sup>α</sup>
Carbon footprint per high-volume HFA salbutamol MDI (kgCO <sub>2</sub> e) <sup>9,10</sup>	28,200 gCO <sub>2</sub> e	28,200 gCO <sub>2</sub> e
Carbon footprint per high-volume HFA salbutamol MDI (km by car) <sup>9,10</sup>	112.6 km	112.6 km
*Yearly carbon footprint of high-volume HFA salbutamol MDI	2,820 <sup>α</sup> tCO <sub>2</sub> e	282 <sup>α</sup> tCO <sub>2</sub> e
**Yearly carbon footprint of high-volume HFA salbutamol MDI (km by car)	11,260,000 <sup>α</sup> km	1,126,000 <sup>α</sup> km

Table 2: Anticipated carbon footprint with change to high-volume MDI

<sup>α</sup> Due to the confidential nature of this data, we have used fictitious numbers to illustrate how we conducted the environmental impact analysis.

# Salbutamol Metered Dose Inhaler PHSa

## Negotiation & Environmental Impact

Prepared for Director of Pharmacy, Purchasing Supervisor

Assuming salbutamol use is similar to the 2021-2022 fiscal year, changing to a high-volume HFA salbutamol MDI would result in a net GHG increase of 1,848<sup>α</sup> tonnes of CO<sub>2</sub>e provincially. This represents a **290% increase in the carbon footprint** of salbutamol use provincially (see Table 3). This increase is equivalent to driving 7.4<sup>α</sup> million kilometers in a standard gasoline-powered vehicle, which is 184<sup>α</sup> times the circumference of the earth each year (see Table 3).

	PHSA	Island Health
*Net increase in salbutamol-related GHG emissions (tCO <sub>2</sub> e)	1,848 <sup>α</sup> tCO <sub>2</sub> e	185 <sup>α</sup> tCO <sub>2</sub> e
**Net increase in salbutamol-related GHG emissions (km by car)	7,380,000 <sup>α</sup> km	738,000 <sup>α</sup> km
***Relative increase in salbutamol-related GHG emissions	290% <sup>α</sup>	290% <sup>α</sup>
****GHG increase relative to earth circumference	184 earths <sup>α</sup>	18.4 earths <sup>α</sup>

Table 3: Comparisons of carbon footprint increase

### Environmental implications at Island Health

At Island Health, changing to a high-volume salbutamol MDI would increase carbon footprint by 185<sup>α</sup> tonnes CO<sub>2</sub>e – which corresponds to driving 738,000<sup>α</sup> km or around the circumference of the earth 23.4 times. This is a **290% increase** in inhaler-associated GHG emissions compared to the low-volume salbutamol MDI options.

As a measure of comparison, Island Health’s vehicle fleet emissions for 2021 were 522 tonnes CO<sub>2</sub>e.<sup>14</sup> The anticipated increase in inhaler-associated carbon footprint from a change to high volume HFA salbutamol **represents 35%<sup>α</sup> of the total Fleet emissions** for Island Health.

To achieve the Province’s public sector target for 2030, “emissions [at Island Health] requiring offset need to drop by 50% in the next decade, regardless of increases in service level”<sup>14</sup> Selecting a high-volume salbutamol MDI, and the consequent anticipated increased carbon footprint, moves us further away from this goal.

### Alignment with organizational values and framework

<sup>α</sup> Due to the confidential nature of this data, we have used fictitious numbers to illustrate how we conducted the environmental impact analysis.

# Salbutamol Metered Dose Inhaler PHSA Negotiation & Environmental Impact

Prepared for Director of Pharmacy, Purchasing Supervisor

---

PHSA recognizes the link between a healthy environment and a healthy population and places high value on environmental sustainability.<sup>13</sup> The Health Organization is committed to a “decision making processes that balance economic, social and environmental imperatives”.<sup>13</sup>

Island Health is also committed to operational excellence and to providing high quality care through climate change response. The organization’s strategic framework includes active support of environmental sustainability best practices which include climate-conscious prescribing to minimize carbon footprint.<sup>1,14</sup>

## Assessment

On a provincial level, changing to a high-volume HFA salbutamol MDI provider would result in a net increase of 1,848<sup>α</sup> tonnes CO<sub>2</sub>e annually which represents a 290% increase in the carbon footprint of salbutamol inhalers provincially. This is equivalent to driving 7.4<sup>α</sup> million kilometers in a gasoline-powered vehicle.

A decision to select a high-volume salbutamol MDI would not be aligned with the organizational goals and strategic framework of PHSA and Island Health from an environmental point of view.

## Recommendations

1. We recommend reviewing the carbon intensity of the different salbutamol MDI options as part of the decision-making process for awarding inhaler contracts. These are the relative carbon footprints of salbutamol MDI devices commercially available in BC:

DINs	Brand Name	Carbon footprint per inhaler (gCO <sub>2</sub> e)	Carbon footprint per inhaler (km by car)
02241497	Ventolin	28,200	112.6
02232570	Airomir	9,720	48.8
02245669	APO-Salbutamol	28,200	112.6
02419858	SANIS-Salbutamol	28,200	112.6
02326450	TEVA-Salbutamol	9,720	48.8

Table 4: Carbon footprint of salbutamol MDIs

2. In addition, we recommend weighing the climate impact of decisions made for future contract negotiation and Requests for Proposals.

<sup>α</sup> Due to the confidential nature of this data, we have used fictitious numbers to illustrate how we conducted the environmental impact analysis.

# Salbutamol Metered Dose Inhaler PHSA Negotiation & Environmental Impact

Prepared for Director of Pharmacy, Purchasing Supervisor

---

## Disclosures

Drs Valeria Stoynova and Celia Culley are the recipients of a national CASCADES innovation grant funded by Environment and Climate Change Canada to study and implement inpatient climate conscious prescribing practices.

They have no industry-related financial disclosures.

## References

1. Island Health. Island Health's 2020-2025 Strategic Framework. Accessed November 21<sup>st</sup>, 2022 from <https://medicalstaff.islandhealth.ca/news-events/island-healths-2020-2025-strategic-framework>
2. Costello, A., Abbas, M., Allen, A., et al. 2009. Managing the health effects of climate change. *The Lancet* 373: 1693-1733.
3. Henderson *et al.* Three measures of forest fire smoke exposure and their associations with respiratory and cardiovascular health outcomes in a population-based cohort. *Environ Health Perspect.* 2011;119:1266-1271
4. Yao J *et al.* Evaluation of a spatially resolved forest fire smoke model for population-based epidemiologic exposure assessment. *J Expo Sci Environ Epidemiol.* 2016;26:233-240.
5. Rappold AG *et al.* Peat bog wildfire smoke exposure in rural North Carolina is associated with cardiopulmonary emergency department visits assessed through syndromic surveillance. *Environ Health Perspect.* 2011;119:1415-1420.
6. Delfino RJ *et al.* The relationship of respiratory and cardiovascular hospital admissions to the southern California wildfires of 2003. *Occup Environ Med.* 2009;66:189-197.
7. Martin KL *et al.* Air pollution from bushfires and their association with hospital admissions in Sydney, Newcastle and Wollongong, Australia 1994-1997. *Aus NZ J Public Health.* 2013;37:238-243.
8. Reid CE *et al.* Critical Review of health impacts of wildfire smoke exposure. *Environ Health Perspect.* 2016;124:1334-1343.
9. Eckelman MJ *et al.* Life cycle environmental emissions and health damages from the Canadian healthcare system: An economic-environmental-epidemiological analysis. *PLoS Med.* 2018;15:e1002623.
10. CASCADES. Environmentally sustainable opportunities for health systems. 2022. Retrieved from <https://cascadescanada.ca/wp-content/uploads/2022/07/June-2022-Inhalers-Infographic-Updated.pdf>
11. Stoynova V *et al.* Detailed inhaler comparison chart. 2022. Retrieved from: <https://cascadescanada.ca/resources/tools-templates/#inhalers>

α Due to the confidential nature of this data, we have used fictitious numbers to illustrate how we conducted the environmental impact analysis.

# Salbutamol Metered Dose Inhaler PHSA Negotiation & Environmental Impact

Prepared for Director of Pharmacy, Purchasing Supervisor

---

12. HealthPRO Procurement Services. PHSA Purchasing Data 2021-2022 Fiscal Year, unpublished. ***Numbers from this report do not feature in any part of this redacted briefing note.***
13. PHSA. Environmental Sustainability Policy. 2017. Retrieved from:  
<http://shop.healthcarebc.ca/FacilitiesManagement/BCD-12-11-40000.pdf>
14. Island Health. 2021 Climate Change Accountability Report. Retrieved from:  
<https://www.islandhealth.ca/sites/default/files/strategic-direction/documents/island-health-ccar.pdf>

α Due to the confidential nature of this data, we have used fictitious numbers to illustrate how we conducted the environmental impact analysis.

# Salbutamol Metered Dose Inhaler PHSA Negotiation & Environmental Impact

Prepared for Director of Pharmacy, Purchasing Supervisor

## Appendix 1 – Calculations

**Table 1 – Current state of salbutamol MDI carbon footprint**

	PHSA	Island Health
Number of salbutamol MDIs purchased during 2021-2022 <sup>11</sup>	100,000 <sup>α</sup>	10,000 <sup>α</sup>
Carbon footprint per low-volume HFA salbutamol MDI (kgCO <sub>2</sub> e) <sup>9,10</sup>	9,720 gCO <sub>2</sub> e	9,720 gCO <sub>2</sub> e
Carbon footprint per low volume HFA salbutamol MDI (km by car) <sup>9,10</sup>	38.8 km	38.8 km
*Yearly carbon footprint low-volume HFA salbutamol MDI (tCO <sub>2</sub> e)	972 <sup>α</sup> tCO <sub>2</sub> e	97.2 <sup>α</sup> tCO <sub>2</sub> e
**Yearly carbon footprint low-volume HFA salbutamol MDI (km by car)	3,880,000 <sup>α</sup> km	388,000 <sup>α</sup> km

Table 1: Current state of salbutamol MDI carbon footprint

\*PHSA - Yearly carbon footprint for **low**-volume HFA salbutamol MDI (tCO<sub>2</sub>e)

= Number of salbutamol MDIs purchased x Carbon footprint per **low**-volume salbutamol MDI (gCO<sub>2</sub>e)

= 100,000<sup>α</sup> x 9,720 gCO<sub>2</sub>e

= 972,000,000<sup>α</sup> gCO<sub>2</sub>e

= 972<sup>α</sup> tCO<sub>2</sub>e

\*Island Health - Yearly carbon footprint for **low**-volume HFA salbutamol MDI (tCO<sub>2</sub>e)

= Number of salbutamol MDIs purchased x Carbon footprint per **low**-volume salbutamol MDI (gCO<sub>2</sub>e)

= 10,000<sup>α</sup> x 9,720 gCO<sub>2</sub>e

= 97,200,000<sup>α</sup> gCO<sub>2</sub>e

= 97.2<sup>α</sup> tCO<sub>2</sub>e

α Due to the confidential nature of this data, we have used fictitious numbers to illustrate how we conducted the environmental impact analysis.

# Salbutamol Metered Dose Inhaler PHSA Negotiation & Environmental Impact

Prepared for Director of Pharmacy, Purchasing Supervisor

---

\*\*PHSA - Yearly carbon footprint for **low**-volume HFA salbutamol MDI (km by car)

= Number of salbutamol MDIs purchased x Carbon footprint per **low**-volume salbutamol MDI (km by car)

= 100,000<sup>α</sup> x 38.8 km by car

= 3,880,000<sup>α</sup> km by car

\*\*Island Health - Yearly carbon footprint for **low**-volume HFA salbutamol MDI (km by car)

= Number of salbutamol MDIs purchased x Carbon footprint per **low**-volume salbutamol MDI (gCO<sub>2</sub>e)

= 10,000<sup>α</sup> x 38.8 gCO<sub>2</sub>e

= 388,000<sup>α</sup> km by car

<sup>α</sup> Due to the confidential nature of this data, we have used fictitious numbers to illustrate how we conducted the environmental impact analysis.

# Salbutamol Metered Dose Inhaler PHSA Negotiation & Environmental Impact

Prepared for Director of Pharmacy, Purchasing Supervisor

**Table 2 – Anticipated carbon footprint with change to high-volume HFA MDI**

	PHSA	Island Health
Number of salbutamol MDIs purchased during 2021-2022 <sup>12</sup>	100,000 <sup>α</sup>	10,000 <sup>α</sup>
Carbon footprint per high-volume HFA salbutamol MDI (kgCO <sub>2</sub> e) <sup>9,10</sup>	28,200 gCO <sub>2</sub> e	28,200 gCO <sub>2</sub> e
Carbon footprint per high-volume HFA salbutamol MDI (km by car) <sup>9,10</sup>	112.6 km	112.6 km
*Yearly carbon footprint of high-volume HFA salbutamol MDI	2,820 <sup>α</sup> tCO <sub>2</sub> e	282 <sup>α</sup> tCO <sub>2</sub> e
**Yearly carbon footprint of high-volume HFA salbutamol MDI (km by car)	11,260,000 <sup>α</sup> km	1,126,000 <sup>α</sup> km

Table 2: Anticipated carbon footprint with change to high-volume MDI

\*PHSA - Yearly carbon footprint for **high**-volume HFA salbutamol MDI

= Number of salbutamol MDIs purchased x Carbon footprint per **high**-volume salbutamol MDI

= 100,000<sup>α</sup> x 28,200 gCO<sub>2</sub>e

= 2,820,000,000<sup>α</sup> gCO<sub>2</sub>e

= 2,820<sup>α</sup> tCO<sub>2</sub>e

\*Island Health - Yearly carbon footprint for **high**-volume HFA salbutamol MDI

= Number of salbutamol MDIs purchased x Carbon footprint per **high**-volume salbutamol MDI

= 10,000<sup>α</sup> x 28,200 gCO<sub>2</sub>e

= 282,000,000<sup>α</sup> gCO<sub>2</sub>e

= 282<sup>α</sup> tCO<sub>2</sub>e

\*\*PHSA - Yearly carbon footprint for **high**-volume HFA salbutamol MDI (km by car)

= Number of salbutamol MDIs purchased x Carbon footprint per **high**-volume salbutamol MDI (km by car)

= 100,000<sup>α</sup> x 112.6 km by car

α Due to the confidential nature of this data, we have used fictitious numbers to illustrate how we conducted the environmental impact analysis.

# Salbutamol Metered Dose Inhaler PHSA Negotiation & Environmental Impact

Prepared for Director of Pharmacy, Purchasing Supervisor

---

= 11,260,000<sup>α</sup> km by car

\*\*Island Health - Yearly carbon footprint for **high**-volume HFA salbutamol MDI (km by car)

= Number of salbutamol MDIs purchased x Carbon footprint per **high**-volume salbutamol MDI (km by car)

= 10,000<sup>α</sup> x 112.6 km by car

= 1,126,000<sup>α</sup> km by car

<sup>α</sup> Due to the confidential nature of this data, we have used fictitious numbers to illustrate how we conducted the environmental impact analysis.

# Salbutamol Metered Dose Inhaler PHSA Negotiation & Environmental Impact

Prepared for Director of Pharmacy, Purchasing Supervisor

**Table 3 – Comparison of carbon footprint increase**

	<b>PHSA</b>	<b>Island Health</b>
*Net increase in salbutamol-related GHG emissions (tCO <sub>2</sub> e)	1,848 <sup>α</sup> tCO <sub>2</sub> e	185 <sup>α</sup> tCO <sub>2</sub> e
**Net increase in salbutamol-related GHG emissions (km by car)	7,380,000 <sup>α</sup> km	738,000 <sup>α</sup> km
***Relative increase in salbutamol-related GHG emissions	290% <sup>α</sup>	290% <sup>α</sup>
****GHG increase relative to earth circumference	184 <sup>α</sup> earths	18.4 <sup>α</sup> earths

Table 3: Comparisons of carbon footprint increase

\*PHSA - Net increase in salbutamol related GHG emissions (tCO<sub>2</sub>e)

= Yearly carbon footprint for high-volume MDI – Yearly carbon footprint per low-volume MDI

= 2,820<sup>α</sup> tCO<sub>2</sub>e – 972<sup>α</sup> tCO<sub>2</sub>e

= 1,848<sup>α</sup> tCO<sub>2</sub>e

\*Island Health - Net increase in salbutamol related GHG emissions (tCO<sub>2</sub>e)

= Yearly carbon footprint for high-volume MDI – Yearly carbon footprint per low-volume MDI

= 282<sup>α</sup> tCO<sub>2</sub>e – 97.2<sup>α</sup> tCO<sub>2</sub>e

= 185<sup>α</sup> tCO<sub>2</sub>e

\*\*PHSA - Net increase in salbutamol related GHG emissions (km by car)

= Yearly carbon footprint for high-volume MDI – Yearly carbon footprint per low-volume MDI

= 11,260,000<sup>α</sup> km – 3,880,000<sup>α</sup> km

= 7,380,000<sup>α</sup> km

<sup>α</sup> Due to the confidential nature of this data, we have used fictitious numbers to illustrate how we conducted the environmental impact analysis.

# Salbutamol Metered Dose Inhaler PHSA Negotiation & Environmental Impact

Prepared for Director of Pharmacy, Purchasing Supervisor

---

\*\*Island Health - Net increase in salbutamol related GHG emissions (km by car)

= Yearly carbon footprint for high-volume MDI – Yearly carbon footprint per low-volume MDI

= 1,126,000<sup>α</sup> km – 388,000<sup>α</sup> km

= 738,000<sup>α</sup> km

\*\*\*PHSA - Relative increase in salbutamol-related GHG emissions

$$= \frac{\text{Yearly carbon footprint high volume HFA MDI}}{\text{Yearly carbon footprint low volume HFA MDI}} = \frac{2,820 \text{ tCO}_2\text{e}}{972 \text{ tCO}_2\text{e}} = 2.9 = 290\%$$

\*\*\*Island Health - Relative increase in salbutamol-related GHG emissions

$$= \frac{\text{Yearly carbon footprint high volume HFA MDI}}{\text{Yearly carbon footprint low volume HFA MDI}} = \frac{282 \text{ tCO}_2\text{e}}{97 \text{ tCO}_2\text{e}} = 2.9 = 290\%$$

\*\*\*\*PHSA - GHG increase relative to earth circumference

$$= \frac{\text{Net increase in salbutamol related GHG emissions (km by car)}}{\text{Earth circumference}} = \frac{7,380,000 \text{ km}}{40,075\text{km}} = 184$$

\*\*\*\*Island Health - GHG increase relative to earth circumference

$$= \frac{\text{Net increase in salbutamol related GHG emissions (km by car)}}{\text{Earth circumference}} = \frac{738,000 \text{ km}}{40,075\text{km}} = 18.4$$

<sup>α</sup> Due to the confidential nature of this data, we have used fictitious numbers to illustrate how we conducted the environmental impact analysis.