

## Trail Area Health & Environment Committee



# SUMMARY

**Meeting: September 22, 2022, 7:00 p.m. by Zoom.**

### **Committee Members in attendance:**

Lisa Pasin, Chair, City of Trail  
Jane Power, Interior Health  
Cassandra Caunce, BC Ministry of Environment  
Dan Bouillon, Teck Trail Operations  
Ron Joseph, Community Member  
Thea Hanson, Community Member  
Annick de Goede, Community Member

Colleen Delaney, BC Ministry of Environment  
Cyra Yunkws, Village of Warfield  
Dr. Karin Goodison, Interior Health MHO  
Clare North, Teck Trail Operations  
Steve Hilts, Community Member  
Julia Stockhausen, Community Member  
Erika Krest, Community Member

### **Others in attendance:**

Ashley Melenchuk, Community Member  
Christina Yamada, Interior Health  
Behn Anderson, BC Ministry of Environment  
Jayne Garry, Teck Trail Operations  
Thompson Hickey, Teck Trail Operations  
Frances Boreland, Broken Hill, Australia

Nelson Ames, Community Member  
Meghan Morris, Interior Health  
David Bell, Teck Trail Operations  
Andrea McCormick, SNC Lavalin  
Michelle Laurie, THEC Lead Facilitator

*The Trail Area Health & Environment Committee (THEC) meets five times per year online or in-person. Members, designates and community members are welcome.*

### **MEETING MINUTES**

- The minutes from THEC meeting, June 21, 2022 were approved and are posted at thep.ca.

### **PRESENTATIONS, REPORTS, DISCUSSIONS & RECOMMENDATIONS**

#### **Annual Air Zone Reports and Resources**

##### **Presenters:**

**Markus Kellerhals and Jerome Robles, Ministry of Environment and Climate Change Strategy**

- Presentation attached.

##### **Air Quality Working Group Resources (Lisa Pasin)**

- SO<sub>2</sub> fact sheets and FAQ developed by the THEC Air Quality Working Group were shared and are available online at thep.ca.
- ENV plain language resources on SO<sub>2</sub> are available at:  
<https://www.env.gov.bc.ca/soe/indicators/air/so2.html>

##### **Teck Commitments (Dan Bouillon)**

- Dan shared Teck Commitments to reducing SO<sub>2</sub> reiterating key points from the June 21<sup>st</sup> 2022 report to THEC.
  - The presentation by Teck on reducing SO<sub>2</sub> emissions (June 21, 2022) is posted online at:  
<https://thep.ca/teck-trail-operations-ambient-so2-reduction-and-control-update-2022/>

#### **Soil Management Prioritization Strategy Update**

**Presenters: Clare North (Teck Trail Operations) and Andrea McCormick (SNC-Lavalin)**

- Presentation attached.

## THEP Strategic Directions (10 mins)

**Presenter: Michelle Laurie, THEC Lead Facilitator**

- The THEP Strategic Directions 5-year Plan (2022-2027) was approved (see attached).
- Next steps include:
  - Posting the Plan on thep.ca.
  - Developing indicators for ongoing monitoring as well as operational plans.
  - Updating THEP communications products to align with the Plan.

## Program Reports & Updates

*To note:*

*All reports are provided in the agenda package (in advance) with the expectation people review these reports prior to the meeting. The focus of the reports section is to share highlights from the different program areas and answer questions from those attending.*

### Air Quality

- Air Quality Report (see attached) – **Dan Bouillon, Teck Trail Operations**
  - Dan highlighted Figure 2 which shows month to month variability of Pb in air due to seasonal differences, weather, wind direction and operational variance.
- Air Quality Working Group Update – **Lisa Pasin, Chair**
  - There was an Air Quality Working Group (AQWG) meeting in July where Donna Haga shared information from a recent Air Quality Health Index (AQHI) review. The closest AQHI to Trail is in Castlegar. One recommendation from the review is that a new model be adopted such that communities that measure only fine particulate matter be able to report the AQHI.
  - The AQWG will combine the AQHI review information with the Pb comparison data for Trail and other Canadian communities. Once available, the full suite of information will be presented to THEC to help answer the question of how Trail's air quality compares with other communities.

### Family Health Report – Meghan Morris, Interior Health

- See attached.
- Meghan shared that ongoing children's blood lead testing clinics are in progress. They appear to have increased participation from previous years which had challenges related to the COVID-19 pandemic. A full report will be shared at the December 1<sup>st</sup> THEC meeting.

### Home & Garden Report – Andrea McCormick, SNC Lavalin

- See attached.
- Andrea provided an update on properties receiving soil management and home visiting with a full report to be presented in February 2023.

### Community & Round Table Check-In

- Ashley Melenchuk from the community introduced herself. She formerly worked at blood Pb clinics, has two older children, and is interested to volunteer time with (and eventually join) the Committee.
- Ron Joseph spoke about noise pollution and appreciated the quick response of Teck to his concerns. Teck advised people with concerns to call Teck's Community and Environment Feedback Line which is posted on the thep.ca homepage.
- All three new community members (Erika Krest, Annick de Goede and Thea Hanson) shared highlights from their first few months including:
  - THEP orientation via a walking tour with program team members;
    - Thea suggested this be expanded to all realtors in the area;

- Desire to contribute to ongoing and future working groups; and
- Desire to find ways to connect the business community to THEP/THEC.

### **Program Planning Update - Michelle Laurie, THEC Lead Facilitator**

- Highlights shared include:
  - Supporting the recent update to THEP's Strategic Plan (approved earlier in the meeting).
  - THEC / THEP orientation with the Mayor, new CAO of Trail and new THEC community members.
  - Public communications such as:
    - Fall Community Newsletter (also online at thep.ca);
    - Article on the front page of the Trail Times in July highlighting the visit to Trail by the South Australia Environmental Protection Authority;
    - Using the downtown message board to share key information;
    - Updating the website to improve navigation, added worker carry home information and removed all COVID-19 information from online consent forms;
    - Developed a vegetable gardening in Trail rack card to hand out during home visits; and
    - Public signage is being developed for handwashing in parks and for air quality monitoring stations in the community (Butler Park and Hayley Park);
      - A draft concept was shared and is attached (air quality monitoring station signage).
  - Upcoming and ongoing projects include:
    - Updating the Moving to Trail brochure (several people volunteered to help out);
    - Developing an internal Knowledge Base to support for onboarding and consistent communications; and
    - Looking into regular surveys / data collection of several services to improve response rates.

### **Partner Meeting Report - Lisa Pasin, THEC Chair, Mayor, City of Trail**

- Lisa met with government agencies from Health and Environment regarding restarting the Trail Health Review Committee (THRC, a Provincial Health Officer initiative).
- The THRC group will meet again in October and has invited the City of Trail to participate with local support including Lisa Pasin (Trail Mayor), Colin McClure (Trail CAO), Steve Hilts (Historical Context/ Technical Experience), Nelson Ames (Historical Context/Technical Experience), and Michelle Laurie (linkages to THEC / THEP).
- Teck will be included in future dialogue as appropriate.
- THRC work is driven by the Provincial government and will parallel THEC work, intersecting at times when outcomes are reached.

**Final THEC meeting of 2022 is Dec 1<sup>st</sup>.**

# Trail Area Health & Environment Committee



## AGENDA

Meeting: September 22, 2022, 7:00 p.m.

By Zoom: <https://us02web.zoom.us/j/85710009031>

### Committee Members:

Lisa Pasin, Chair, City of Trail  
Sandy Santori, Alternate Chair, City of Trail  
Dr. Karin Goodison, Interior Health MHO  
Jane Power, Interior Health  
Kyle Jorgenson, USW Local 480 Rep  
Ron Joseph, Community Member  
Dan Bouillon, Teck Trail Operations  
Clare North, Teck Trail Operations  
Annick de Goede, Community Member

Linda Worley, RDKB Area B  
Cyra Yunkws, Village of Warfield  
Ali Grieve, RDKB Area A  
Cassandra Caunce, BC Ministry of Environment  
Colleen Delaney, BC Ministry of Environment  
Thea Hanson, Community Member  
Steve Hilts, Community Member  
Julia Stockhausen, Community Member  
Erika Krest, Community Member

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### WELCOME and INTRODUCTIONS

- Opening remarks from Mayor Lisa Pasin, THEC Chair

### MEETING MINUTES

- Approve minutes from THEC meeting, June 21, 2022 (as attached)

### PRESENTATIONS, REPORTS, DISCUSSIONS & RECOMMENDATIONS

#### Annual Air Zone Reports and Resources (30 mins)

Presenters:

Senior Air Quality Science Officer, Ministry of Environment and Climate Change Strategy (Markus Kellerhals)

- Q&A

#### Air Quality Working Group Resources (Lisa Pasin)

- See attached
- Q&A

#### Teck Commitments (Dan Bouillon)

- Q&A

#### Discussion

#### Soil Management Prioritization Strategy Update (20 mins)

Presenters: Clare North (Teck Trail Operations) and Andrea McCormick (SNC-Lavalin)

- Questions and discussion

#### THEP Strategic Directions (10 mins)

Presenter: Michelle Laurie, THEC Lead Facilitator

- Questions and discussion

**Program Reports & Updates** (45 mins)

*PLEASE NOTE:*

*All reports are provided in the agenda package for your review prior to the meeting. TO MAKE THE MOST OF OUR TIME TOGETHER, PLEASE BRING YOUR QUESTIONS OR ITEMS FOR FURTHER DISCUSSION.*

**Air Quality**

- Air Quality Report (see attached) – **Dan Bouillon, Teck Trail Operations**
- Air Quality Working Group Update – **Lisa Pasin, Chair**

**Family Health Report** – (see attached) **Meghan Morris, Interior Health**

**Home & Garden Report** – (see attached) **Andrea McCormick, SNC Lavalin**

**Community & Round Table Check-In - All** (15 mins)

- Round table contributions & questions

**Program Planning Update - Michelle Laurie, THEC Lead Facilitator**

**Partner Meeting Report - Lisa Pasin, THEC Chair, Mayor, City of Trail**

**2022 THEC MEETING DATES**

- December 1

THEC meetings are held from 7:00-9:00pm.

# **Presentations**

# Annual Air Zone Reports and Resources

# Air Zone Reports: Updates on Sulphur Dioxide (SO<sub>2</sub>) in Trail

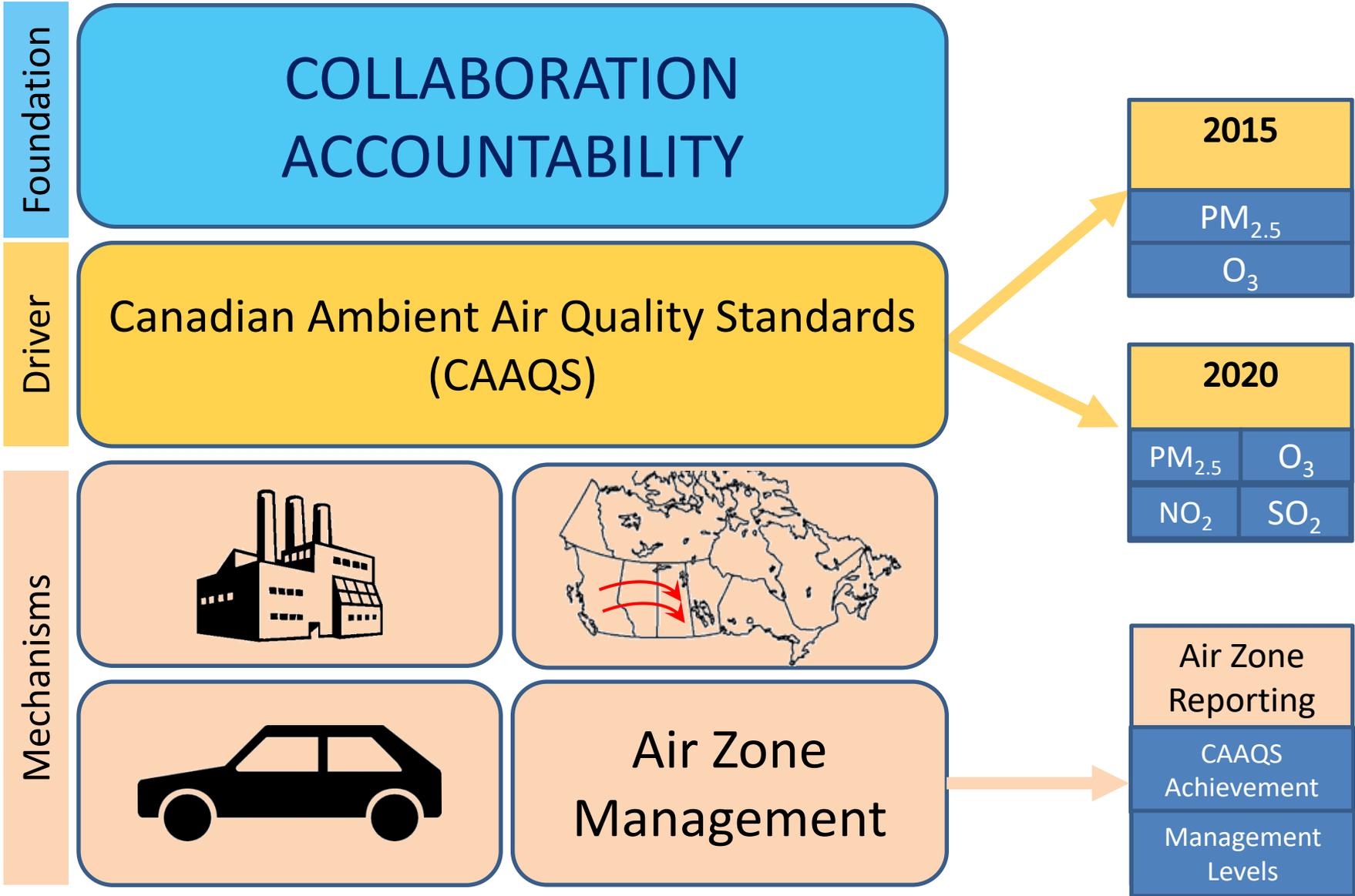
Presentation to  
Trail Health and Environment Committee

Jerome Robles, Ph.D., P.Eng.  
Markus Kellerhals, M.Sc.  
Environmental Standards Branch  
September 2022

# Purpose

- The 2018-2020 air zone report showed Trail exceeding the national standards for sulphur dioxide – what does this mean?
- What is the purpose of air zone reports?
- What is the significance of exceeding the national standards?
- What are the implications for air quality management in Trail?

# Air Quality Management System (AQMS)



# Air Quality Objectives

Pollutant	Avg. Period	B.C. AQO	2015 CAAQS	2020 CAAQS	2025 CAAQS
Nitrogen Dioxide (NO <sub>2</sub> )	1 hour	60 ppb <sup>a</sup>	-	60 ppb	42 ppb
	Annual	17 ppb	-	17 ppb	12 ppb
Ozone (O <sub>3</sub> )	1-hour	82 ppb <sup>b</sup>			
	8 hour	-	63 ppb <sup>c</sup>	62 ppb <sup>c</sup>	60 ppb <sup>c</sup>
Sulphur Dioxide (SO <sub>2</sub> )	1 hour	75 ppb <sup>d</sup>	-	70 ppb <sup>e</sup>	65 ppb <sup>e</sup>
	Annual			5 ppb	4 ppb
Fine Particulates (PM <sub>2.5</sub> )	24 hour	25 µg/m <sup>3</sup> <sup>f</sup>	28 µg/m <sup>3</sup> <sup>g</sup>	27 µg/m <sup>3</sup> <sup>g</sup>	-
	Annual	8 µg/m <sup>3</sup>	10 µg/m <sup>3</sup>	8.8 µg/m <sup>3</sup> <sup>h</sup>	-

<sup>a</sup> Annual 98<sup>th</sup> percentile of daily 1-hour max

<sup>b</sup> For guiding air quality advisories

<sup>c</sup> Annual 4<sup>th</sup> highest of daily 8-hour max, averaged over 3 years

<sup>d</sup> Metric transitions to CAAQS for 2020

<sup>e</sup> Annual 99<sup>th</sup> percentile of daily 1-hour max, averaged over 3 years

<sup>f</sup> Annual 98<sup>th</sup> percentile of daily 24-hour average

<sup>g</sup> Annual 98<sup>th</sup> percentile of daily 24-hour average, averaged over 3 years

<sup>h</sup> Annual average, averaged over 3 years

# Air Zone Reports

## What is an Air Zone Report?

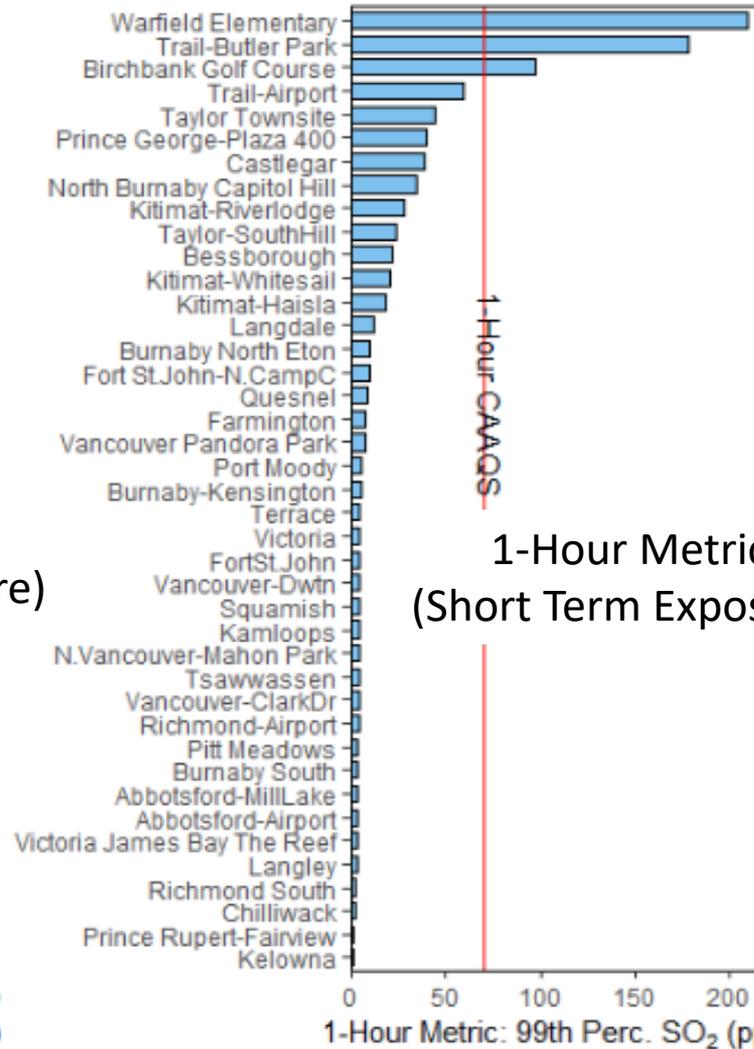
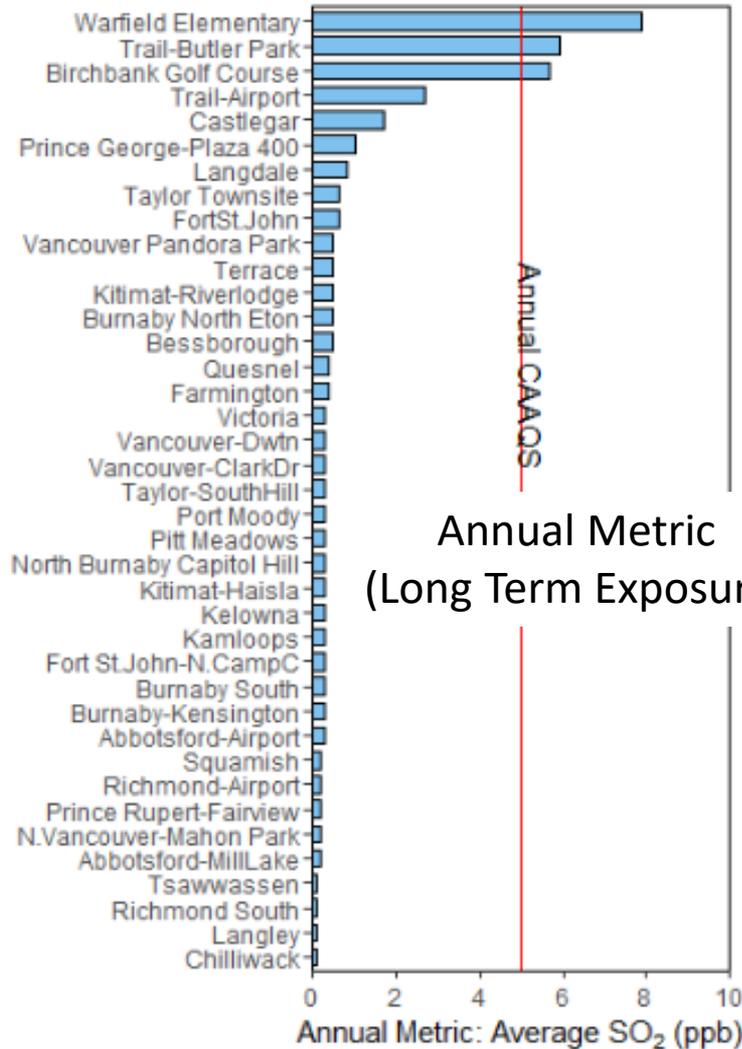
- Commitment under the AQMS to report on air quality
- Reporting is by air zone. B.C. has 7 zones : based on similar geography / air quality / meteorology
- Reporting is annual, but based on a 3-year reporting period to minimize the impact of year-to-year fluctuations
- Key part of report: Assess for CAAQS achievement and assign management levels
- Trail is located in the Southern Interior Air Zone

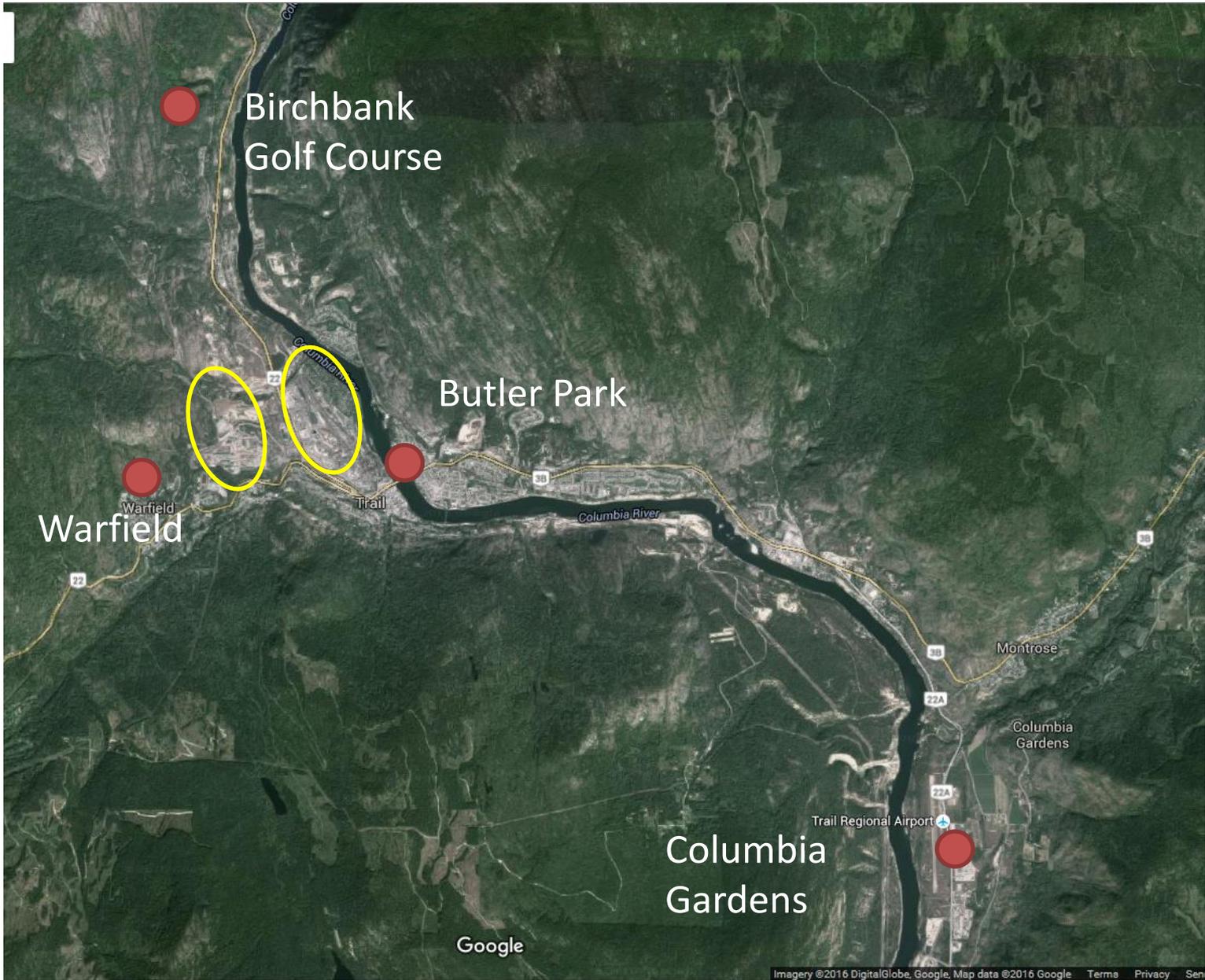


# Air zone reports – What's new?

- 2018 -2020 air zone reports were released Summer 2022
- First to report against stricter 2020 CAAQS for fine particulate matter and ozone
- First to include reporting of levels of NO<sub>2</sub> and SO<sub>2</sub> based on 2020 CAAQS for those pollutants
- Results of air zone reports are also summarized on the Environmental Reporting BC website as “air indicators”
  - Same information in a more public-friendly format
- The new reporting puts additional spotlight on the air quality levels in B.C. communities but doesn't mean air quality has gotten worse

# SO<sub>2</sub> Metrics Based on 2018-2020 Data





Birchbank  
Golf Course

Warfield

Butler Park

Columbia  
Gardens

Trail Regional Airport

Google

Imagery ©2016 DigitalGlobe, Google, Map data ©2016 Google Terms Privacy Sen

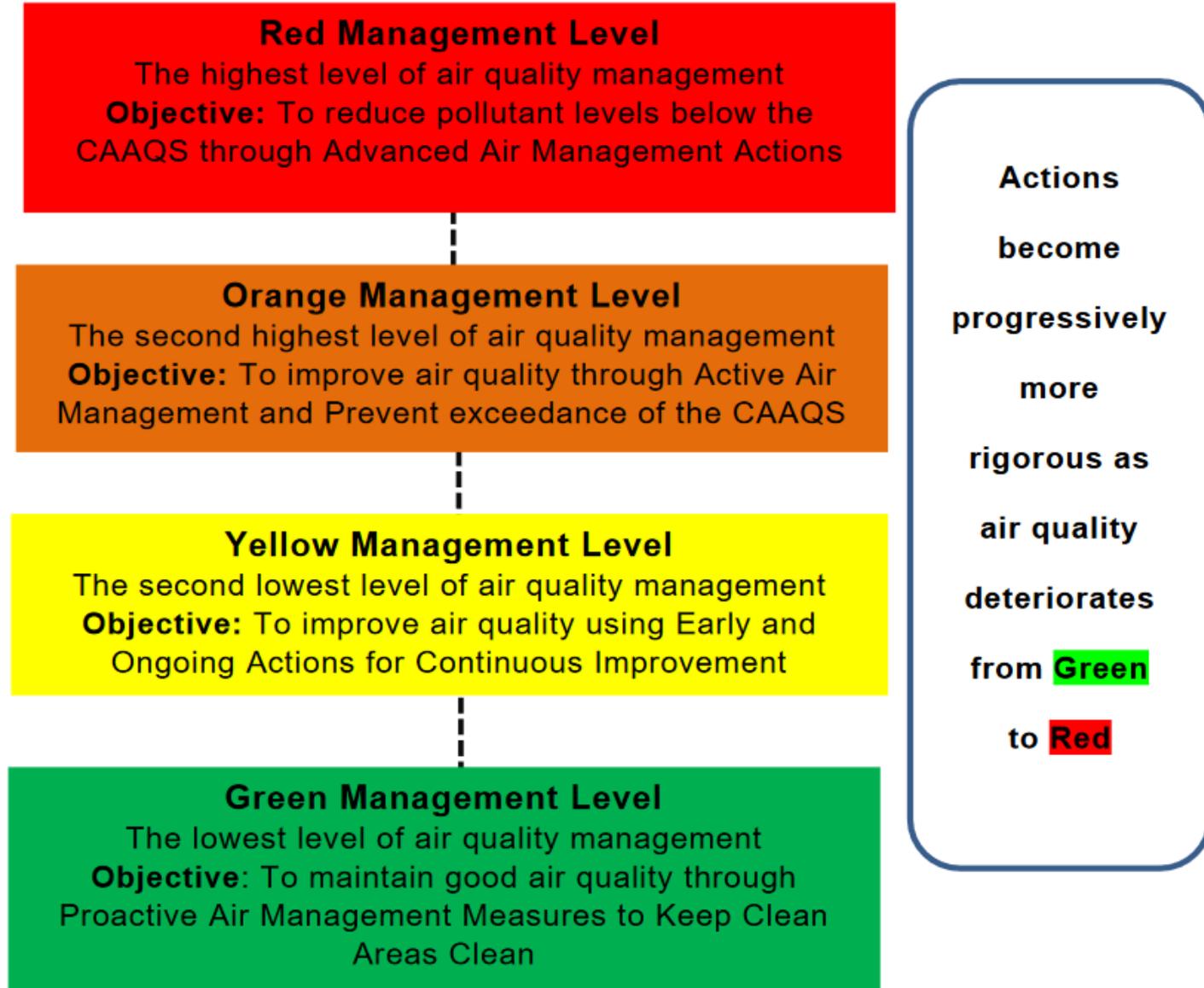
# 2018-2020 Provincewide Results

Air Zone	Air Zone Management Levels Results			
	PM <sub>2.5</sub>	O <sub>3</sub>	NO <sub>2</sub> ( <i>new</i> )	SO <sub>2</sub> ( <i>new</i> )
Central Interior	Houston, Valemount, Vanderhoof, Quesnel( <i>new</i> )	Prince George Williams Lake	All Sites	Prince George
Coastal	Kitimat Terrace	Prince Rupert Terrace	Kitimat, Terrace Prince Rupert	Kitimat, Terrace Prince Rupert
Georgia Strait	Several Sites	Duncan	Victoria	All Sites
Lower Fraser Valley	Vancouver-Clark Dr.	Some Sites	Most Sites	North Burnaby- Capitol Hill
Northeast	Fort St. John	All Sites	Fort St. John Taylor	Taylor
Northwest	N/A	N/A	N/A	N/A
Southern Interior	Grand Forks( <i>new</i> )	Kelowna Vernon	Kamloops Vernon	Trail Sites

## Recommended Actions Based on Air Zone Management Framework

Achieve CAAQS	Prevent CAAQS Exceedance	Prevent Air Quality Deterioration	Keep Clean Areas Clean
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# What do the air zone management levels mean?



# Actions at the “Red” Management Level

- B.C. is committed to achieving the CAAQS over time
- Therefore, exceeding the CAAQS is an indication that work is needed to improve air quality.
- Exceeding the CAAQS will not automatically trigger certain actions. Rather management actions to achieve CAAQS depend on sources/local context.
- Specifically:
  - Continue the progressive improvements required under Teck Metals permit
  - Work with interested parties to achieve CAAQS over time
  - Focus on the relevant sectors/sources
  - Role of authorizations/permitting in next steps

# Summary

- Latest Air Zone Report published in June 2022 now includes reporting on SO<sub>2</sub>
- Trail and the Southern Interior are assigned “red” management level for SO<sub>2</sub>
- SO<sub>2</sub> reporting is new – the air quality issue is not
- Province is committed under AQMS to achieve CAAQS over time and ongoing collaboration with Trail

# Resources

Air Zone Reports: [gov.bc.ca/airzonereports](http://gov.bc.ca/airzonereports)

B.C. Air Quality: [gov.bc.ca/airquality](http://gov.bc.ca/airquality)

Air Indicators:

[www2.gov.bc.ca/gov/content?id=FF80E0B985F245CEA62808414D78C41B](http://www2.gov.bc.ca/gov/content?id=FF80E0B985F245CEA62808414D78C41B)

Contact for Questions:

Jerome A. Robles, Ph.D., P. Eng.

Environmental Standards Branch/Clean Air

Ministry of Environment and Climate Change Strategy

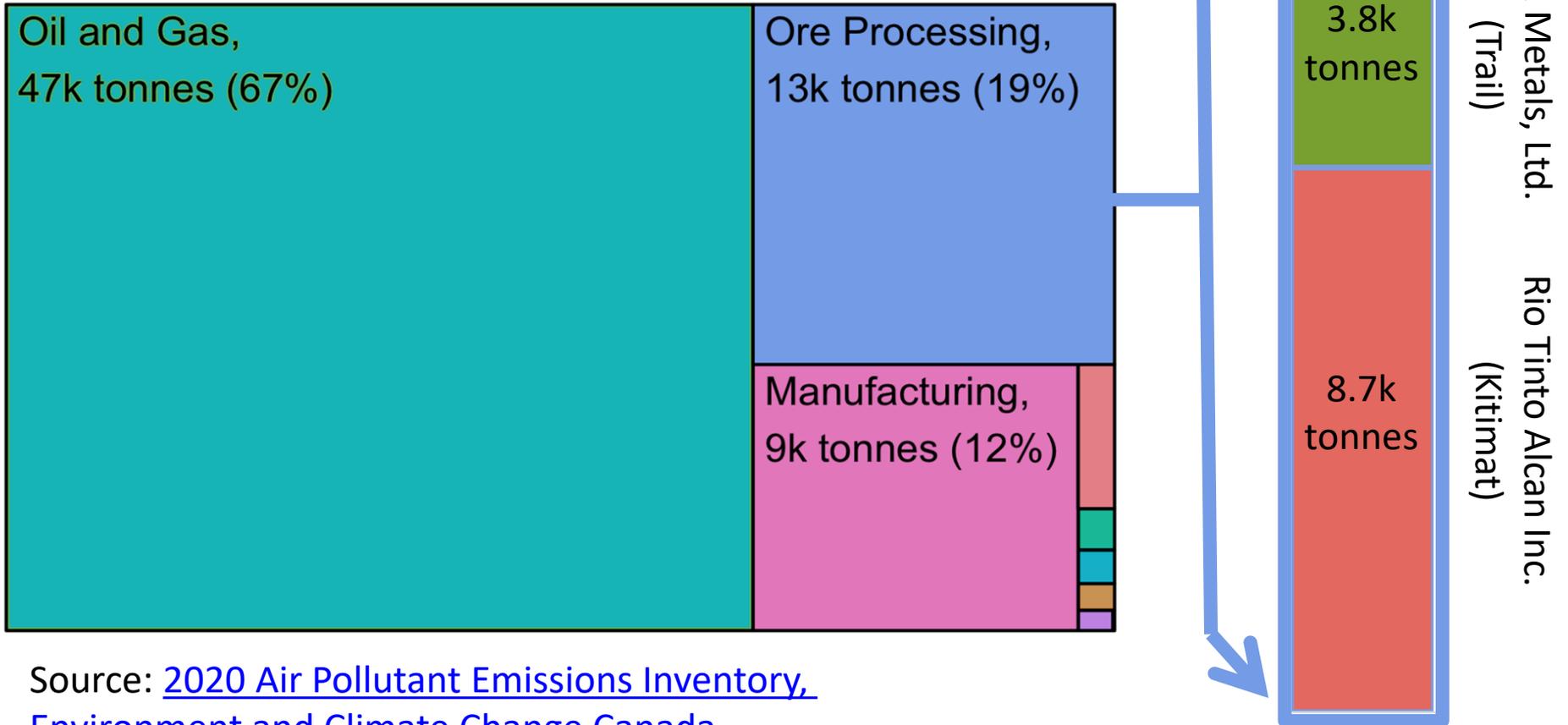
[BCairquality@gov.bc.ca](mailto:BCairquality@gov.bc.ca)

# Sulphur Dioxide (SO<sub>2</sub>)

- Colourless gas, strong odour, soluble in water
- Adverse respiratory effects; asthmatics especially sensitive
- Direct effects on vegetation
- Contributes to acid rain and acidification of soils, water
- Precursor to fine particulate formation
- Major sources include oil & gas sector, pulp mills and metal smelters

# SO<sub>x</sub> Emissions in B.C. (2020)

Total Annual Emissions: 69,915 tonnes



Source: [2020 Air Pollutant Emissions Inventory, Environment and Climate Change Canada](#)

# Process to Develop SO<sub>2</sub> CAAQS

2012: Priority identified

2014: Draft Human Health Risk Assessment\*

2014: Range proposal

2015: Recommendations

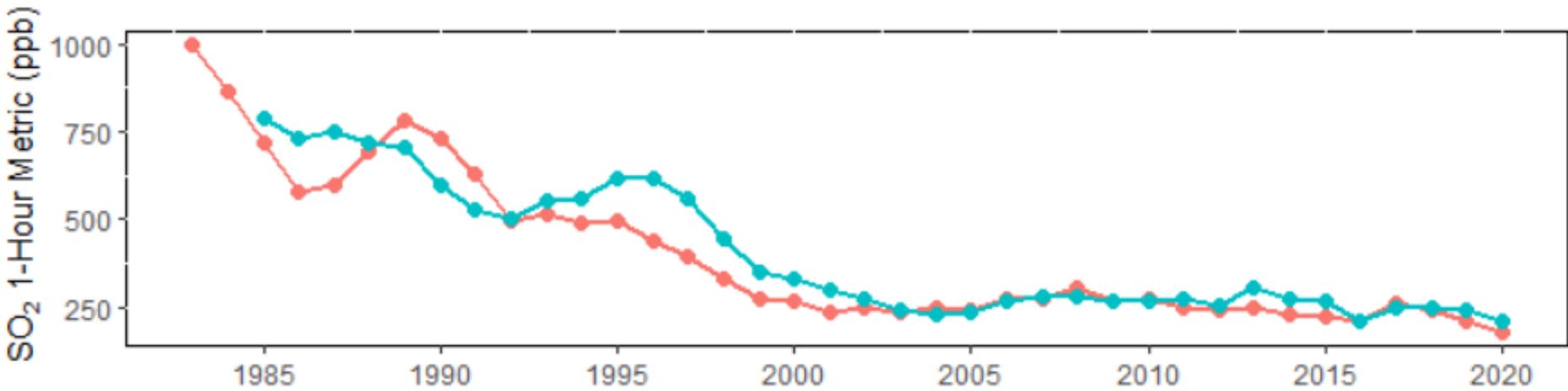
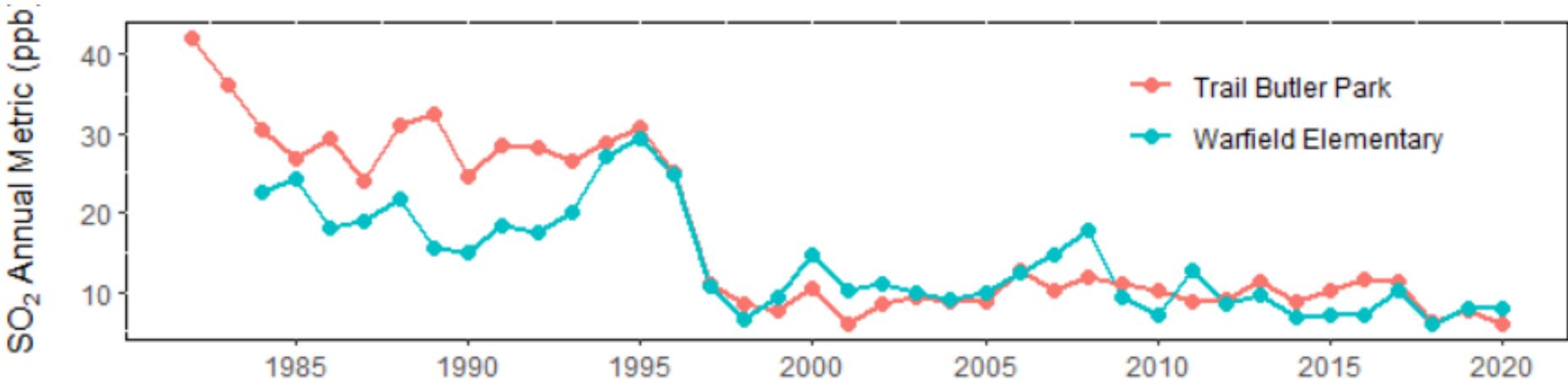
2016: Endorsement by Council of Ministers

2017: Establishment as national objectives

2022: B.C. 2018-2020 Air Zone Report includes SO<sub>2</sub>

\*Final HHRA at: <https://www.canada.ca/en/health-canada/services/publications/healthy-living/human-health-risk-assessment-sulphur-dioxide-executive-summary.html>

# Sulphur Dioxide Levels Through the Years



# Sulphur Dioxide (SO<sub>2</sub>)

## Learn and Take Action!



**Sulphur Dioxide (SO<sub>2</sub>) is a colourless, reactive gas** emitted by Teck Trail Operations. SO<sub>2</sub> is generated as a by-product of processing mine concentrates into metal and chemical products.



### Who may be sensitive to the effects of elevated SO<sub>2</sub>?

Young children, elderly people, and persons with chronic respiratory disease, especially persons with asthma.



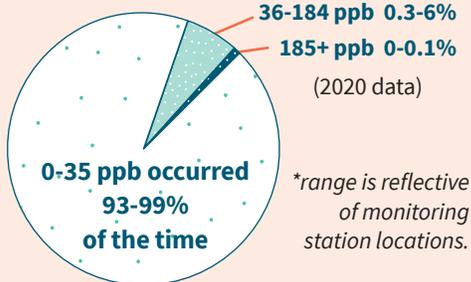
Short-term exposures to **elevated SO<sub>2</sub> levels** can cause the air passages in the lungs to constrict or tighten, leading to breathing difficulties and tightening in the chest. Symptoms may worsen during vigorous exercise or hard physical labour.

### CURRENT SO<sub>2</sub> LEVELS:

<https://www.env.gov.bc.ca/epd/bcairquality/readings/find-stations-map-SO2.html>

### How do I know what the SO<sub>2</sub> levels are in Trail?

Levels change throughout the day. Check current SO<sub>2</sub> levels online:



### Where can I find out more?

Check out the FAQs online: [thep.ca/faqs](http://thep.ca/faqs)

Residents who have concerns about air quality are encouraged to call the Teck Community and Environment Feedback line at (250) 364-4817, a phone line answered 24 hours a day.

If you have health concerns, please contact your family doctor.

## People I care for may be sensitive to SO<sub>2</sub> When do I need to change routines?

Adjust routine as SO<sub>2</sub> levels increase



### 0-35 ppb

No routine change or adjustment needed.



### 36-184 ppb

Persons with chronic respiratory conditions such as asthma should consider reducing or rescheduling strenuous outdoor activities if experiencing symptoms. No effects are expected for the general population.



### 185+ ppb

Persons with chronic respiratory conditions such as asthma should reduce or reschedule strenuous activities outdoors. Others, especially children and the elderly, should also consider avoiding outdoor physical exertion.

# Air Quality Program: Sulphur Dioxide (SO<sub>2</sub>)

**Sulphur Dioxide (SO<sub>2</sub>) is a colourless, reactive, gas which at high levels can adversely impact human health and the environment.**

SO<sub>2</sub> is emitted by Teck Trail Operations as a by-product of processing mine concentrates, which contain sulphur, into metal and chemical products. SO<sub>2</sub> levels are not static and change throughout the day.

**Those most sensitive to the effects of SO<sub>2</sub> include persons with chronic respiratory disease, especially persons with asthma.**

Short-term exposures to elevated SO<sub>2</sub> levels can cause the air passages in the lungs to constrict or tighten, leading to breathing difficulties and tightening in the chest. Symptoms may worsen during vigorous exercise or hard physical labour.

## GENERAL GUIDANCE FOR 1-HOUR SO<sub>2</sub> LEVELS

SO <sub>2</sub> Levels	Consider taking the following action at these levels
0-35 ppb	None
36-184 ppb	Persons with chronic respiratory conditions such as asthma should consider reducing or rescheduling strenuous outdoor activities if experiencing symptoms. No effects are expected for the general population.
185+ ppb	Persons with chronic respiratory conditions such as asthma should reduce or reschedule strenuous activities outdoors. Others, especially children and the elderly should also consider avoiding outdoor physical exertion.

Benchmarks for short-term (1-hour) SO<sub>2</sub> levels in air have been developed by the Canadian and BC governments to guide collaborative action (among other objectives). Based on recent monitoring in Trail, SO<sub>2</sub> levels exceeded the benchmarks for ambient air quality set for 2020.

Still, **SO<sub>2</sub> levels in Trail continue to decline** with environmental improvements at Teck Trail Operations. Currently more than 99% of the sulphur is captured and converted to by-products, such as sulphuric acid and fertilizer. About 1% leaves the operation as emissions to air. The location of the smelter is in the heart of Trail, within a deep valley, and at times constrains dispersion of air emissions.

**! YOU CAN CHECK CURRENT SO<sub>2</sub> LEVELS ONLINE.**

Visit <https://www.env.gov.bc.ca/epd/bcairquality/readings/find-stations-map-SO2.html>

Residents who have concerns about air quality are encouraged to call the **Teck Community and Environment Feedback line at (250) 364-4817**, a phone line answered 24 hours a day.

# Air Quality Program FAQ: Sulphur Dioxide (SO<sub>2</sub>)

## 1. What is sulphur dioxide (SO<sub>2</sub>)?

SO<sub>2</sub> is a colourless, reactive gas. At higher concentrations it can have a strong odour. It is produced during the combustion of sulphur-containing fuels and industrial operations involving sulphur-containing materials. Major sources of SO<sub>2</sub> in BC include the upstream oil and gas industry, metal smelting facilities, pulp / paper mills and marine operations (in the Lower Mainland area). Once released, one possibility is that SO<sub>2</sub> can react with other compounds in the air to form fine particulate matter (small solid or liquid particles suspended in air).

## 2. Why do we have SO<sub>2</sub> in Trail?

SO<sub>2</sub> is emitted by Teck Trail Operations as a by-product of processing mine concentrates, which contain sulphur, into metal and chemical products. With environmental improvements, SO<sub>2</sub> emissions continue to decline. Teck Trail Operations currently captures more than 99% of the sulphur and converts it to by-products, such as fertilizer and sulphuric acid. About 1% leaves the operation through emissions to air. Sulphur capture at Teck Trail Operations is similar to what you might find at a brand-new smelter. However, the dispersion of air emissions from the smelter is constrained due to the location of the smelter, weather and the surrounding topography. SO<sub>2</sub> levels in Trail are not static and fluctuate throughout the day, month and year. See FAQ 7 and 8 for more information on SO<sub>2</sub> levels.

## 3. How does SO<sub>2</sub> affect my health?

Short-term exposures to elevated SO<sub>2</sub> levels can cause the air passages in the lungs to constrict or tighten, leading to breathing difficulties and tightening in the chest. Symptoms may include constriction or tightening of the airways in the lungs, coughing, wheezing and shortness of breath. It may also irritate the nasal passage, throat and eyes. Those most sensitive to the effects of SO<sub>2</sub> include persons with chronic respiratory disease, especially persons with asthma. Symptoms may worsen during vigorous exercise or hard physical labour. See FAQ 7 and 8 for more information on SO<sub>2</sub> levels.

## 4. What are the long-term risks of SO<sub>2</sub> exposure?

Long-term exposure to the particles produced by the reaction of SO<sub>2</sub> with other compounds in the air may also affect your health. These particles penetrate deeply into the lungs. This can cause irritation and inflammation that can damage the lining of the lungs and affect other parts of the body. Particles can worsen existing heart and respiratory disease, including emphysema and bronchitis. Because of this, children who live in areas with elevated sulphur dioxide concentrations may develop more breathing problems as they get older.

## 5. How do I know if I am sensitive to SO<sub>2</sub>?

Some people, particularly those with respiratory conditions, may be more sensitive to SO<sub>2</sub> exposure. Sensitivities may result in symptoms such as irritation of the eyes and respiratory symptoms such as coughing, wheezing and shortness of breath.

## 6. Who is at the highest risk of SO<sub>2</sub> exposure?

Workers in industrial facilities where SO<sub>2</sub> is used or is a by-product of industrial processes have the greatest exposure. People who live near these industries and other point sources can also be exposed to higher levels of SO<sub>2</sub>. See FAQ 7 and 8 for more information on SO<sub>2</sub> levels.

## 7. What actions can I take to reduce potential health effects of SO<sub>2</sub>?

When SO<sub>2</sub> concentrations are elevated, consider reducing or rescheduling activities outdoors, remaining indoors, and reducing indoor sources of SO<sub>2</sub> including tobacco smoke and unvented gas stoves. Persons with asthma should follow a management plan developed with their health care provider. If you are having trouble breathing, have chest pain or discomfort, or a severe cough, contact your health care provider or emergency department. See HealthLinkBC for a summary of health recommendations.

The SO<sub>2</sub> levels and health guidance in the table below are based on Health Canada's 2016 Human Health Risk Assessment for Sulphur Dioxide. For more information on the levels experienced in Trail, see FAQ 8.

SO <sub>2</sub> Levels	Consider taking the following action at these levels
0-35 ppb	None
36-184 ppb	Persons with chronic respiratory conditions such as asthma should consider reducing or rescheduling strenuous outdoor activities if experiencing symptoms. No effects are expected for the general population.
185+ ppb	Persons with chronic respiratory conditions such as asthma should reduce or reschedule strenuous activities outdoors. Others, especially children and the elderly should also consider avoiding outdoor physical exertion.

>>

## Air Quality Program FAQ: Sulphur Dioxide (SO<sub>2</sub>) cont.

### 8. What are the SO<sub>2</sub> levels in Trail?

Actual ambient SO<sub>2</sub> concentrations in Trail fluctuate throughout the day, month and year.

This chart calculates the total hours of SO<sub>2</sub> measured in community air (by monitoring station) in 2020. For actions to take at different levels, see FAQ 7.

Station	SO <sub>2</sub> Levels ppb	Hours / year*	% Time *
Birchbank	0-35	7604	97.4
Golf Course	36-184	200	2.6
	185+	0	0
Trail Butler Park	0-35	8050	96.7
	36-184	269	3.2
	185+	6*	0.1
Trail Columbia Gardens	0-35	8354	99.7
Airport	36-184	23	0.3
	185+	0	0
Warfield Elementary	0-35	7801	93.9
	36-184	495	6
	185+	10*	0.1

\*In 2020 Birchbank Golf Course monitored 89% of the year, and the remaining three stations monitored 95% of the year.

\*\*In 2020, all hours that measured above 185 occurred between 7am-11am.

Although levels fluctuate, monitoring data from recent years exceed the benchmarks for ambient air quality set by the Provincial and Federal governments that came into effect in 2020.

Find current and historical data online at:

<http://www.env.gov.bc.ca/epd/bcairquality/readings/find-stations-map-SO2.html>

### 9. Where is SO<sub>2</sub> monitored in Trail?

SO<sub>2</sub> is monitored by Teck at four locations throughout Trail and the surrounding areas – Birchbank, Butler Park, Columbia Gardens and Warfield. These stations operate continuously, with near real-time data publicly available. SO<sub>2</sub> levels fluctuate throughout the day, month and year. Find current and historical levels online at: <http://www.env.gov.bc.ca/epd/bcairquality/readings/find-stations-map-SO2.html>

### 10. What is Teck doing to reduce SO<sub>2</sub> emissions?

Over the past 30 years, over \$1.7 billion has been invested in a modernization program to improve the operational and environmental performance at Teck Trail Operations resulting in significant improvements in community air quality.

Teck Trail Operations currently captures more than 99% of the sulphur contained in feed and meets the highest standard for sulphur capture for base metal smelters across Canada.

Teck Trail Operations has made a 25% reduction in emissions in the last ten years, accomplished through the installation of two new state of the art Acid Plants and operational changes. Teck Trail Operations continues to drive improvements and is currently advancing capital projects to achieve further reductions by 2023.

In addition to SO<sub>2</sub> emissions reduction initiatives, Teck Trail Operations uses near real-time data to manage SO<sub>2</sub> (see FAQ 11 for details).

### 11. How does Teck Trail Operations use data to manage SO<sub>2</sub> levels in Trail?

In addition to reducing emissions, near real-time data is transmitted to Teck Trail Operations' process control systems. If SO<sub>2</sub> levels begin to rise (such as during a temperature inversion or during periods of higher emissions), plants at Teck Trail Operations are automatically notified so that actions can be taken to further reduce SO<sub>2</sub> at the source and in the community.

The Ministry of Environment and Climate Change and Teck Trail have the ultimate goal of achievement of the Provincial and Federal benchmarks.

### 12. Who regulates Teck with respect to SO<sub>2</sub>?

Teck Trail Operations operates under permits established by the BC Ministry of Environment and Climate Change Strategy (ENV).

### 13. What are the applicable standards for SO<sub>2</sub>?

Air quality is managed to protect the environment and human health relative to BC's Air Quality Objectives (AQOs) and the Canadian Ambient Air Quality Standards (CAAQS). For SO<sub>2</sub>, BC AQO are the same as the CAAQS; more information about these standards can be found at: [https://www2.gov.bc.ca/assets/gov/environment/air-land-water/air/reports-pub/fs\\_so2\\_caaqs.pdf](https://www2.gov.bc.ca/assets/gov/environment/air-land-water/air/reports-pub/fs_so2_caaqs.pdf).

BC uses these benchmarks to guide regulatory decisions, including permitting of discharges to air, to assess air quality, issue public advisories, aid regulatory development and support long-term air management strategies.

### 14. If I have a concern about air quality or health, who do I contact?

Residents who have concerns about air quality are encouraged to call the Teck Community and Environment Feedback line at (250) 364-4817, a phone line answered 24 hours a day. If you have health concerns, please contact your family doctor.

# Soil Management Prioritization Strategy Update



## Soil Remediation

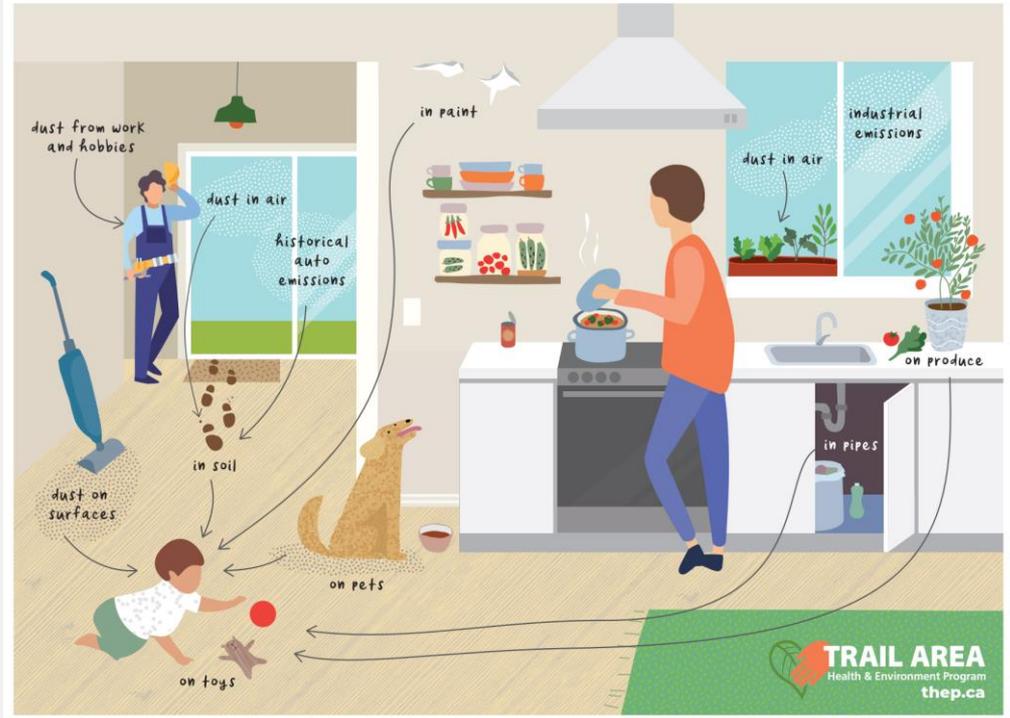
What it is, Who gets it and Why?

Presentation to the THEC – September 22, 2022

# Why do we remediate soil?

- › **Limit dust and track-in** of soil and dust into homes
- › Reduce the risks of soil ingestion by **young children**
- › Ensure soil is **managed and properly disposed of** during projects

**Lead Exposure Pathways** Lead in the home comes from many different sources.



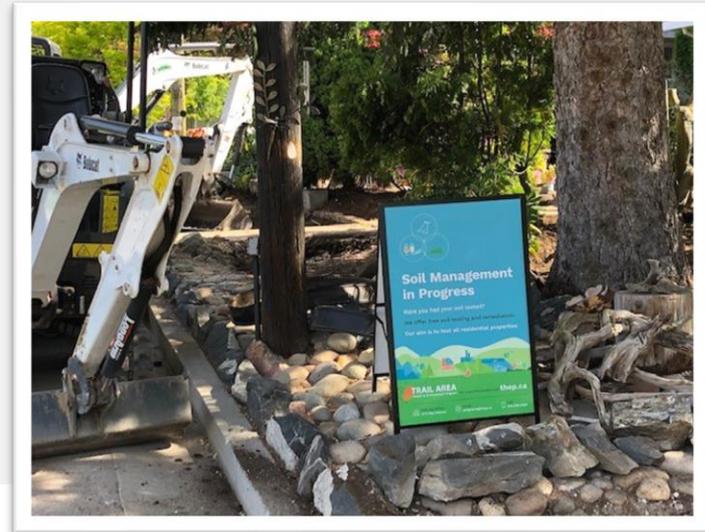
# What is Remediation?

*“... eliminate, limit, correct, counteract, mitigate or remove any contaminant or the adverse effect on the environment or human health....”* (Environmental Management Act. Chapter 53

Part 1)

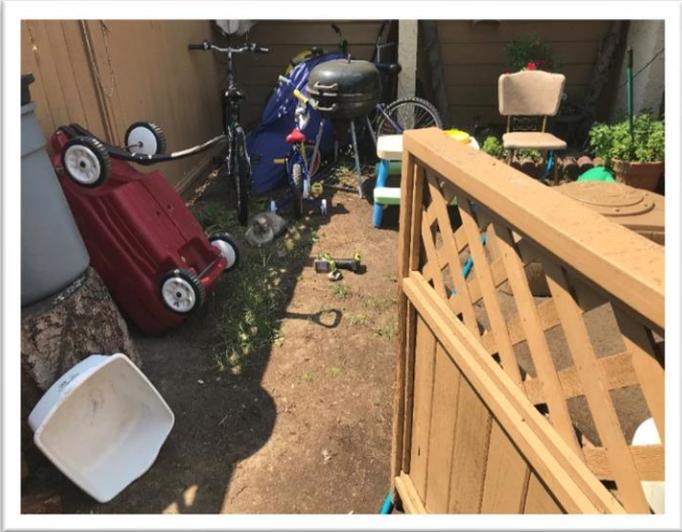
This translates into THEP Soil Management Programs

- › Soil testing
- › Education
- › Ground cover evaluation
- › Lawn care
- › Capping bare areas
- › Replacing soil
- › Soil pick up and disposal
- › Vegetable Gardens
- › Mulching garden beds, etc.

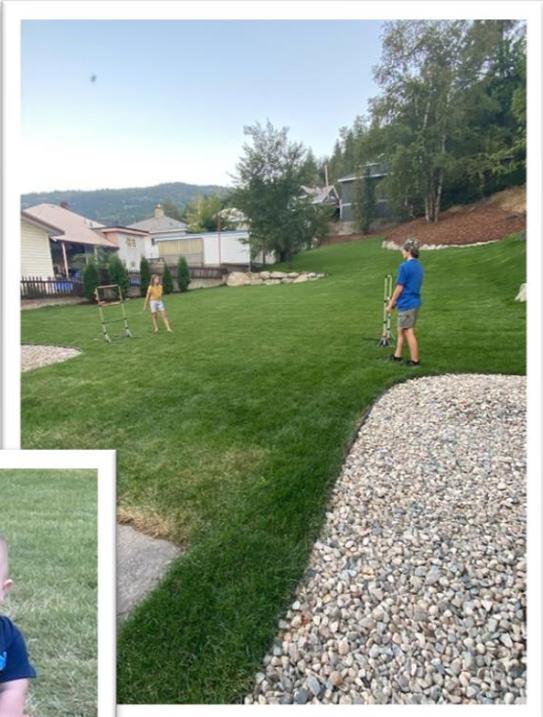


# Who gets soil remediation?

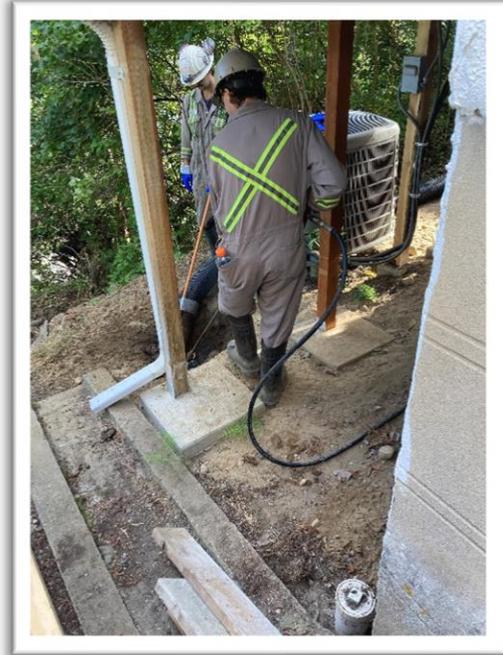
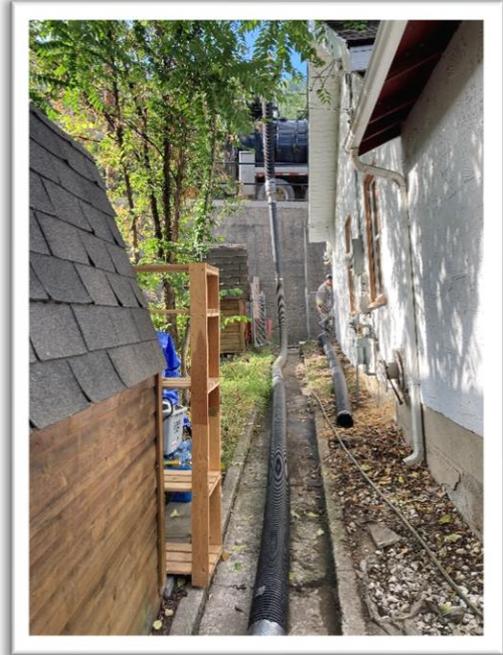
# Renters with Young Children



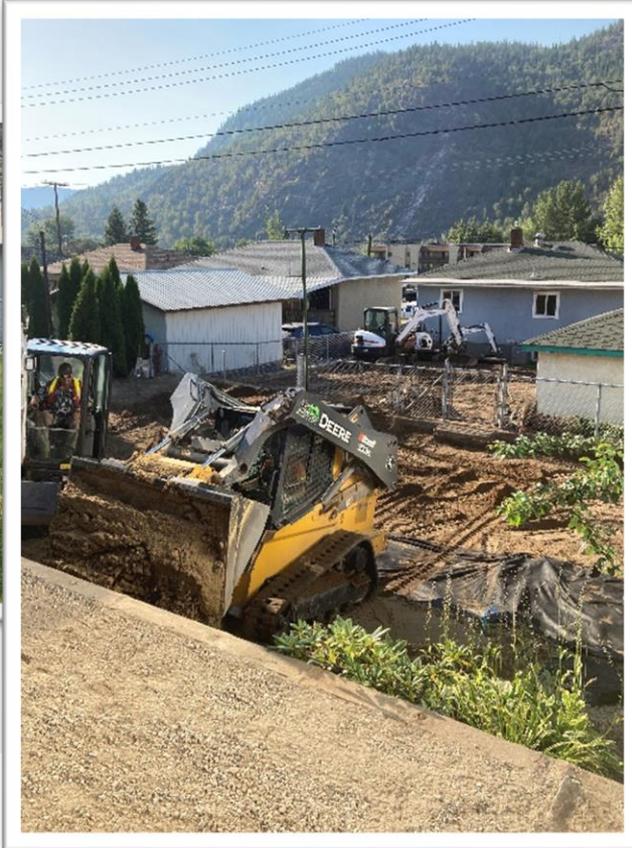
# Families with Children



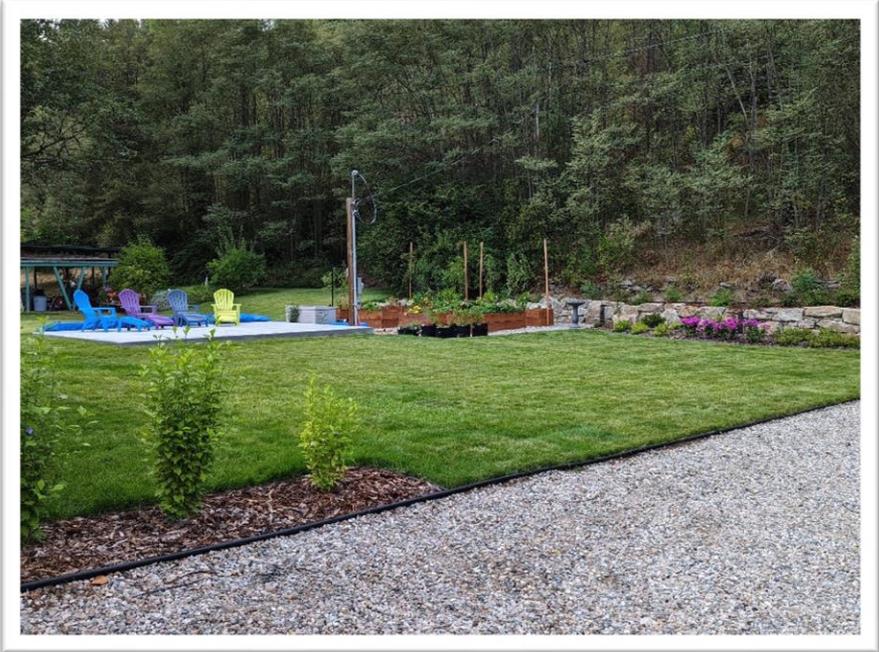
# Homeowners with Difficult Access



## Properties where we need access



# Homeowners doing Landscaping Projects



# Vegetable Gardeners



# Prioritization

# Prioritization Framework

Attempts to address properties where there is the greatest risk of exposure to soil by children

Based on:

Age of Children on the property

- Including the amount of **Time on the Property**

Quality of Ground Cover

- Particularly in **Primary Play Areas**

Soil Pb Concentration

- Specifically in **Bare Areas**



## Is this a priority?

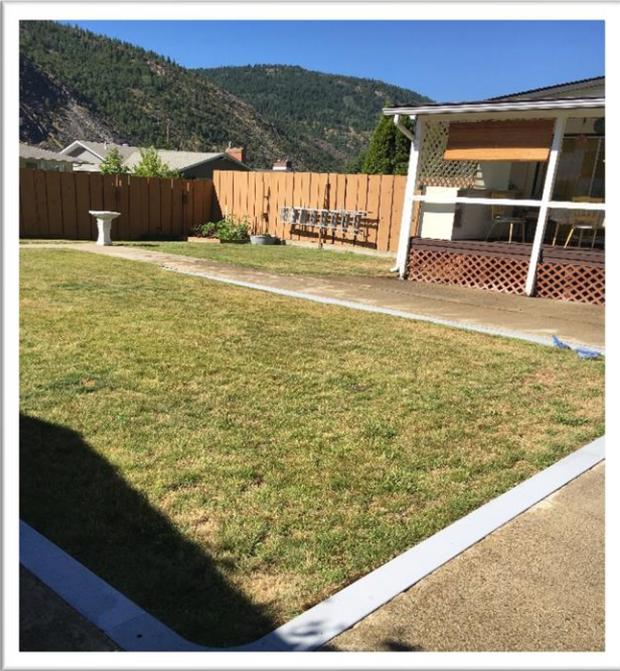


YES!

This is a priority because:

- › Young children
- › Bare Soil in Play Areas
- › Soil Pb over threshold

## Is this a priority?



No!

This is not a priority because:

- › Children are not present
- › Good ground cover

## Is this a priority?



We need more information:

1. Soil Testing
2. Learn more about their project
3. Apply for soil disposal at RDKB

## Looking forward

- › Continue with priority properties where children are living or cared for full time
- › Look more at adjacent priorities and other properties where remediation may be needed in future years
- › Looking at addressing properties with higher Pb concentrations



Thank you!

# **Discussions & Recommendations**

# THEP Strategic Directions



# Strategic Directions 5-Year Plan

**2022-2027**



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## ACKNOWLEDGEMENTS

This five-year Strategic Directions Plan will be a guide for the Trail Area Health & Environment Program (THEP) from 2022 to 2027. The City of Trail, on behalf of the Trail Area Health & Environment Committee (THEC), gratefully acknowledges the collaborative work over forty years that has led to this plan. For close to a year, numerous people have been involved in developing the strategic directions, and the following are acknowledged for their contributions:

### THEC members:

Lisa Pasin, Chair, City of Trail	Linda Worley, RDKB Area B
Sandy Santori, Alternate Chair, City of Trail	Cyra Yunkws, Village of Warfield
Dr. Karin Goodison, Interior Health MHO	Ali Grieve, RDKB Area A
Jane Power, Interior Health	Kyle Jorgenson, USW Local 480
Cassandra Counce, BC Ministry of Environment*	Clare North, Teck Trail Operations*
Colleen Delaney, BC Ministry of Environment*	Dan Bouillon, Teck Trail Operations
Julia Stockhausen, Community Member*	Thea Hanson, Community Member*
Annick de Goede, Community Member	Steve Hilts, Community Member
Ron Joseph, Community Member	Erika Krest, Community Member

### Additional community member input:

Nelson Ames  
John Aitken\*

### Partner and program staff expertise:

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Cecilee Pittman, Interior Health*	Suzanne Belanger, Teck Trail Operations
Meghan Morris, Interior Health	David Bell, Teck Trail Operations
Donna Haga, BC Ministry of Environment	Wendy Goodrich, SNC Lavalin
Linden Terry, BC Ministry of Environment	Cindy Hall, SNC Lavalin
Andrea McCormick, SNC Lavalin	Alexa Matthes, SNC Lavalin*

### External review:

Kate Mahoney  
Jennifer Ellis

### Writing and editing:

Michelle Laurie, THEC Lead Facilitator\*

The asterix (\*) denotes members of THEC's Strategic Directions Working Group who provided extensive and ongoing input, direction and support to development of THEP's strategic directions plan.

*Adopted by THEC on September 22, 2022.*

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## 1.0 INTRODUCTION

### The Program

The Trail Area Health & Environment Program (THEP, also referred to as the Program) represents a unique collaboration in support of community health and wellbeing in an area influenced by smelter air emissions for over 125 years. The comprehensive Program enables the community to understand and navigate ways to reduce exposure to lead (Pb), as well as sulphur dioxide (SO<sub>2</sub>). Program components focus on air, health, soil, built environments (e.g. homes, daycares, civic buildings, fences, sheds, etc), and community connection, while keeping the perspective of the whole in mind. The Program also addresses the inherent overlap of different exposure pathways and maximizes opportunities for improving health and the environment through an integrated approach.



In addition, a Program team delivers program components to the community and helps to increase their understanding of broad air quality, environmental, and health regulations in the local context of Trail. The team strives for continuous improvement of activities with respect to issues that are regulated by the Province of BC (e.g. source emissions), as well as issues outside of government regulation (e.g. in-home visiting and Pb safe renovation). Ongoing work of the Program includes activities contributing to THEP's purpose, sharing learning locally and beyond, and ensuring linkages with community partners.

## **This Document**

This strategic directions plan was developed with recognition of various concurrent processes, often with related objectives, occurring in and around Trail to improve community health and the environment in relation to the operation of the smelter. This five-year strategy leverages the unique capacity, roles, and expertise of the partners (see section 3.0) and community.

This is not a legal document. This is a guide that the partners can use to work together toward their shared ambitions. Its strength is that while people often come from different viewpoints, the partners acknowledge the cooperative spirit by which this Program has been developed. They also acknowledge the expectation that the various Program elements will be monitored and adjusted based on new knowledge, always keeping the community at the forefront of decision making. This document sets out the broad areas of work, aspirations, and milestones to achieve.

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## 2.0 BACKGROUND

Trail, British Columbia has been the site of one of the world's largest lead and zinc smelting facilities for over 125 years, with the community of Trail growing up around the smelter, creating unique challenges for people and the environment.

A University of British Columbia (UBC) study in 1989 found that children in Trail had elevated blood Pb levels as a result of air emissions from the smelter.<sup>1</sup> Parents were concerned, and the community came together to form a community-industry-government task force working in partnership to reduce children's blood Pb levels. Through extensive research and independent reviews, the Trail Lead Task Force made the groundbreaking recommendation to focus on air quality as the first major action in reducing exposure to Pb (and other smelter metals) in Trail. Work began in 1991 to reduce emissions at the source (the smelter complex), and to generate extensive community-wide support and involvement, as well as provide education. This led to a decade of success in reducing children's blood Pb levels in Trail. In 2001, the Trail Lead Task Force concluded and its work continued through the creation of THEP and the Trail Area Health & Environment Committee (THEC).

THEP has continuously strived to evolve with emerging science and understanding. Over the past decade, further reductions in fugitive emissions from the smelter complex (dust that escapes from buildings, stockpiles, roadways, and other activities on site) and public health primary prevention programs targeted at young families have resulted in the lowest levels of Pb in community air and the lowest children's blood Pb levels ever documented in Trail. The public-facing members of the Program team have become active members in the social landscape, contributing to the overall wellbeing of families and community in the Trail area.

Program partners and the community are committed to being leaders for positive change. In the 1990s, the average blood Pb level in Trail children was over 14 µg/dL, and since 2018, the average level is consistently under 3 µg/dL. Provincially, the BC Centre for Disease Control uses a blood Pb level of 5 µg/dL as a guideline to prompt follow up into Pb exposure. Still, there is more work to be done to drive down blood Pb levels of children in Trail and surrounding areas. The average blood Pb level remains higher than national levels, and there are individual children in Trail and area who exceed the BC guideline for follow-up.

In addition to Pb, SO<sub>2</sub> is emitted by Teck Trail Operations as a by-product of processing mine concentrates into metal and chemical products. In 2020, building on the momentum of new Federal and Provincial Air Quality Standards, a working group of THEC initiated public communications in the community related to SO<sub>2</sub>. This expanded the focus of the Program beyond Pb (and other smelter metals) to include SO<sub>2</sub>.

This strategic directions plan is an update to the 2014 Program document.

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<sup>1</sup> Hertzman, C *et al.*, (1990). Trail Lead Study Report. Available at: <https://thep.ca/wp-content/uploads/2020/07/1989-Trail-Lead-Study-Report.pdf>

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### 3.0 GOVERNANCE, WORKING GROUPS AND PARTNERS

THEP reports to the Trail Area Health & Environment Committee (THEC). THEC is formally established as a Select Committee of the City of Trail.<sup>2</sup> The Terms of Reference (ToR) are approved by Trail City Council and are intended to be reviewed on the same five-year schedule as updates to the strategic directions plan.

#### **THEC Mandate** (as per the Terms of Reference updated in June 2022)

To be a transparent platform for multi-stakeholder dialogue, collective decision making and community engagement with respect to the THEP.

#### **Role**

- Participate in the decision making and approve the strategic direction of the THEP.
- Monitor and advise Trail City Council on the implementation of the THEP.
- Support collaboration between Program partners in an effort for the whole to be greater than the sum of the parts.
- Help interpret and understand the complexities of the comprehensive Program, including contextualizing information to the local area.
- Establish and convene Working Groups from time to time to investigate and make recommendations on specific issues (for example Air Quality Working Group, Community Renewal Working Group).
- Facilitate public communication and oversight with respect to delivery of services and progress toward the joint goals and objectives of the THEP.
- Provide voice for the community of Trail in related processes taking place concurrently at times, and relevant to attaining the stated goals and objectives.
- Be a mechanism for Program accountability to the community, the City, as well as between the partners.

As mentioned above, THEC has established working groups, such as:

- Air Quality Working Group (AQWG). This group is comprised of THEC members and technical specialists from Teck Trail Operations, IH, and ENV. The purpose is to gain a better understanding of, and prioritize, air quality issues that impact the community from environmental and health perspectives.
- The Community Renewal Working Group. This group is led by a THEC community member and is tasked with finding ways to ensure ongoing inclusion, representation, and engagement of community in THEC/THEP activities.

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<sup>2</sup> In 2001, the Trail Lead Task Force recommended evolving into the Trail Area Health & Environment Committee (THEC), a select committee of the City of Trail, for governance, and the Program, as a mechanism to collaboratively address the purpose through activities in the community.

## Importance of Community

Community leadership and participation on THEC is fundamental to its success. Community engagement has ensured a potentially stigmatizing issue is a community success story. This is exemplified by exceptionally high participation rates in children's Pb testing clinics and other programs, owing in large part to the high degree of trust and good will generated by the Program. Community leaders keep up the conversation, provide local context, and root strategic directions in on-the-ground realities. The community voice helps to hold all partners accountable to the residents and each other.

Without the community at the table, THEC would revert to being a regulatory discussion between industry and government, excluding the people that the programs are intended to benefit. Meaningful involvement of people in decisions affecting their life/health is itself a determinant of health. Effective citizen participation requires a facilitative effort because of the complexity of the issues; however community members will voice their perspectives if they are empowered and listened to.

## The Program Partners

The Program is implemented by multiple partners, each with their own mandate. Together they work toward shared objectives and goals with respect to improvements in knowledge, awareness, and health related to Pb and SO<sub>2</sub>. The Program partners are the City of Trail, Teck Trail Operations, Interior Health (IH), and the BC Ministry of Environment and Climate Change Strategy (ENV). Program partners each have two representatives on THEC.

## Partners Committee<sup>3</sup>

The Partners Committee is composed of the entities who hold responsibility for delivering Program components, and who also sit on THEC. In addition to the roles outlined below, the partners are committed to building on the synergies of each others' activities and finding opportunities to maximize impact.

## Partner Roles:

- The City of Trail is the convenor, providing facilitation and collaboration support for the partners, the Program team, as well as THEC. In addition, the City supports community engagement and additional dust control measures throughout the Trail area. Activities are implemented via elected officials, hired consultants, and City staff.
- Teck Trail Operations manages air quality, soil, and built environment components of the Program. This includes air emissions monitoring, reporting, and improvements; soil testing and remediation; and primary prevention via in-home visits (in collaboration with IH's team), provision of lead-safe renovation information and supplies, and support for partnerships in the community. Secondary prevention is addressed through additional support for families that the IH Medical Health Officer (MHO) is following up with. Activities are implemented via Teck employees and a consulting team.

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<sup>3</sup> Historically this committee was referred to as the THEC Executive Committee.

- IH manages health components of the Program, including primary and secondary prevention activities. This includes in-home visits with a Public Health Nurse, engagement with the local community, management of blood Pb testing clinics, and providing Enhanced Support<sup>4</sup> in collaboration with partners. Activities are implemented via the Public Health Nurse with support of the MHO, the Manager of Environmental Management, and the IH THEC representative.
- ENV has regulatory oversight of Teck Trail Operations as it relates to environmental protection (i.e. discharges to the environment). ENV provides expertise and serves as a liaison to the community and other partners. This includes working with Teck to ensure data have undergone quality control measures, participating in activities of the Air Quality Working Group, and being available to engage with the community as requested. Activities are implemented via the Authorizations and Land Remediation Branch, as well as the Senior Air Quality Meteorologist.

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<sup>4</sup> Enhanced Support is additional follow-up by THEP provided to all children in the Trail area that test above 5 micrograms per decilitre through blood Pb testing.

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## 4.0 THEP PURPOSE, VISION, MISSION, AND VALUES

### Purpose

THEP's purpose is to support the community of Trail and surrounding areas to live, work, and play in an area influenced by smelter air emissions.

### Vision

A community with thriving families, environment, and economy.

### Mission

THEP aims to reduce exposure to smelter air emissions such as Pb (lead) and SO<sub>2</sub> (sulphur dioxide) by collaboratively working together to improve air quality, provide community-based education and programs to reduce children's blood Pb levels, and ultimately improve people's health.

### Values

**Health** – Program resources are targeted at reducing people's health risks and empowering families and others to support their health journey.

**Community** – Community members are integral to success, from programs on the ground to participation in decision making, and have the largest proportion of representation on THEC. Program goals and activities are reviewed by the community through regular public consultation, and the Program actively contributes to community health and wellbeing.

**Partnership** – THEP uses a partnership approach in governance and Program delivery. It has been recognized for the effectiveness of its collaborative multi-stakeholder model of industry, government, and community working together for mutual benefit.

**Science-based** –THEP designs and delivers activities based on scientific research, evidence of effectiveness, and a recognition of complex systems.

**Accountability** – THEP is accountable to the community, THEC, and other stakeholders through transparent decision making, responsive and timely programming, and proactive public communication and consultation.

**Trustworthy** – THEP is open, honest, and transparent in its actions and communication with the public, with each other as partners, and with THEC.

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## 5.0 STRATEGIC DIRECTIONS

THEP strategic directions focus on themes the Program works on, as well as where the Program intersects, adds value, and creates meaning to achieve the vision of a community with thriving families, environment, and economy. This strategic document was developed on the heels of a global pandemic, which challenged partners to find ways to continue working together and with the community, across distance and competing demands. It acknowledges the excellence that occurred and that there is still work ahead.

### 5.1 Air

*Issue:* Trail is home to one of the world's largest Pb and zinc smelting and refining facilities. While significant operational improvements have been made to reduce emissions, Pb and SO<sub>2</sub> levels in air have the potential to impact community health. It's important to ensure air quality data in the ambient air quality monitoring network are representative of the community's air and provide high-quality, timely data to track progress, inform decision making, and contextualize Trail relative to other Canadian communities.

#### Pb in Air:

Monitoring data at the established community monitoring stations meet the most stringent standard in the world. However, children's blood Pb levels are higher than non-smelter communities, and ongoing emissions contribute to Pb in dust in the community (as measured by Pb in ambient air). Further reductions of fugitive dust may provide opportunity for reductions in blood Pb levels. Fugitive emissions may also influence soil Pb levels in the community.

#### SO<sub>2</sub> in Air:

Monitoring data at the established community monitoring stations show periodic elevated levels of SO<sub>2</sub> that exceed the recently introduced federal standard. Short-term exposure to elevated levels of SO<sub>2</sub> can constrict or tighten air passages in the lungs, leading to breathing difficulties and tightening in the chest. Young children, elderly people, and those with chronic respiratory disease are most sensitive. While sulphur capture at Teck Trail Operations meets the highest standard for smelters across Canada, and SO<sub>2</sub> emissions are lower than other Canadian smelters, dispersion of SO<sub>2</sub> emissions can be constrained due to the location of the smelter, weather, and the surrounding topography. Teck Trail Operations is working on a program to reduce SO<sub>2</sub> emissions; however improvement will take several years.

#### What needs to be done:

- Continue to implement the programs in place to identify and support the implementation of actions that improve air quality and reduce Pb in dust in the community (e.g. the fugitive dust reduction program, SO<sub>2</sub> reduction program).

- Continue collection and verification of relevant air quality data to support partners and researchers to evaluate the influence of air quality on community health.
- Undertake community education to increase knowledge around SO<sub>2</sub> levels, the potential health effects, and actions that can be taken so that people are empowered to make choices around their health.

### THEP Ambition:

Air quality measures for Pb and SO<sub>2</sub> meet the most stringent applicable criteria:

- Pb levels in air around Trail consistently meet 0.15 µg/m<sup>3</sup> on a three-month rolling average across the community; and
- SO<sub>2</sub> levels in the air around Trail meet Canadian Ambient Air Quality Standards.

### Milestones of THEP partners toward achieving the ambition:

1. By 2025, review the ambient air monitoring network in the community and, where necessary, identify recommendations for modifications to ensure air quality data are representative of the community's air.
2. Annually, demonstrate improvements in Pb in ambient air, as measured in the community.
3. Biannually review and update the communications plan on community education around SO<sub>2</sub> levels in Trail, potential risks, and actions to take.

## 5.2 Soil

*Issue:* Emissions from over 125 years of metallurgical operations in Trail have resulted in elevated levels of Pb and other metals in soil in the surrounding area (EM Area).<sup>5</sup> These levels are above natural background levels and regulatory standards. Teck is the responsible party for soil impacted by historical emissions in accordance with the *Environmental Management Act* and the Contaminated Sites Regulation. While working towards an approved Wide Area Remediation Plan (WARP),<sup>6</sup> annual soil management plans, developed by Teck and submitted to ENV, aim to address potential health risks associated with metal contaminated soil. Examples of activities in annual soil management plans include soil testing, remediation, and management in residential yards, parks, and commercial properties. While the community is supportive of soil management, it's important people understand that there are multiple exposure pathways for Pb, and all actions to potentially reduce Pb dust in the home and community are necessary (see 5.3 and 5.6 below). In addition, to ensure sustainability of the soil work taking place, it's important to understand the potential influence of contemporary air emissions on soil as the smelter continues to operate.

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<sup>5</sup> The Environmental Management Area (EM Area) is outlined on the map in section 7.0.

<sup>6</sup> Teck is working with ENV to develop a long-term soil management plan called a Wide Area Remediation Plan (WARP).

### What needs to be done:

- Continue reducing the potential exposure to Pb and other metals in soil via soil management on a prioritized basis.
- Improve communications on the potential risk from metals in soil, who may be at risk, and the supports available to the community.
- Ensure soil is contextualized as one exposure pathway, and that people understand soil management may not be the only (or the most impactful) action to reduce Pb exposure (and lower blood Pb levels).
- Undertake research and monitoring to understand the sustainability of soil management in the community.

### THEP Ambition:

Metal contaminated soil in the Environmental Management (EM) Area is managed in a risk-based and prioritized way through an approved approach under a WARP (Wide Area Remediation Plan).

### Milestones of THEP partners toward achieving the ambition:

1. Annually, ensure the soil management prioritization framework meets the needs of changing priorities and emerging issues.
2. Annually, support prioritized soil management on residential properties by identifying priority properties and offering soil management work.
3. By 2024, develop a long-term monitoring program to:
  - a. evaluate soil metal levels over time, including the influence of contemporary emissions; and
  - b. consolidate performance verification activities for remediated sites.
4. By 2025, identify opportunities for, and provide outreach to, property developers to increase their knowledge and understanding on soil management considerations in the EM Area.
5. By 2025, identify, evaluate, and recommend solutions for soil management including soil relocation, reuse, and disposal strategies for the EM Area that support a long-term sustainable approach to soil management.
6. By 2025, support the community to have an increased awareness and understanding around metal contaminated soil, potential risks, soil management programs, and priorities.
7. Integrate THEP-supported soil management activities into the development of a future WARP for the EM Area.

## 5.3 Built Environments

*Issue:* Pb in indoor dust is a significant pathway for children’s Pb exposure, and continues to be an important focus of THEP’s in-home visits to families with children under 36 months old. There are many sources of Pb in homes in the Trail area, including smelter emissions and other non-smelter related sources. Many buildings (homes and other structures) in the Trail area were built prior to the regulation of Pb in paint and plumbing materials and have a greater likelihood of containing Pb-based paint or Pb in plumbing. Also, older homes can contain historical Pb dust from an era when smelter emissions were higher. Chipping and peeling paint creates Pb dust, which can be accessed and ingested by small children, and paint and dust stirred up during renovation activities may expose residents to Pb dust. Furthermore, as air quality improves, soil management activities reach more properties, and the Program expands to communities more distant to the smelter, the relative influence of Pb exposure from sources in the built environment may be more significant.

### What needs to be done:

- Continue to work with families through in-home visits<sup>7</sup> to provide:
  - education about various potential sources of Pb; and
  - supports that help to reduce potential Pb exposure in the built environment.
- Gain an understanding of the relative influence of non-smelter sources of Pb in the built environment.
- Educate renovators (Do-It-Yourself (DIY) and contractors) to identify Pb risks during renovation projects and protect themselves, their families, and others in the household.

### THEP ambition:

Current and future residents and caregivers in the Trail area are knowledgeable, supported, and empowered to ensure their built environments are lead-safe.

### Milestones of THEP partners toward achieving the ambition:

1. Biannually review and update the communications plan on community education about Pb sources in the built environment.
2. Annually, ensure at least 90% of the known eligible homes / daycares are offered an in-home visit by the community program representative focused on a healthy home.
3. Biennially, demonstrate that at least 80% of in-home visit recipients surveyed feel they were empowered to take action in their home or daycare environment.
4. By 2025, review data collected through existing THEP activities to evaluate the prevalence of Pb-based paint in the Trail area and make recommendations, as required,

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<sup>7</sup> Eligible families receive an in-home visit from the community program representative focused on a healthy home environment and an in-home visit from the Public Health Nurse focused on a healthy family.

to update THEP guidance for residents on managing Pb based paint and dust in the home.

5. By 2026, demonstrate an increase in THEP's online lead-safe renovation support and education usage.

## 5.4 Health

*Issue:* There is considerable research that shows a link between blood Pb levels and health effects. Children are known to be particularly vulnerable to the effects of Pb. Since 1991, Trail has been hosting and encouraging participation in the annual voluntary children's blood Pb clinics, and notably the average blood Pb level in children has been going down. A Health Canada (2013)<sup>8</sup> literature review identified that a range of 1 to 2 µg/dL of Pb in blood may be associated with a one point reduction in children's IQ. Effects have not been clinically diagnosed in individual children, but rather were identified through studies of populations (large groups) of children.<sup>9</sup> Many other factors, beyond Pb exposure, contribute to IQ differences,<sup>10</sup> which could potentially be influenced in a positive way through improvements in early childhood education supports. In addition, pregnant women who are exposed to Pb can also pass it on to their baby.

Further, as described in section 5.1 on air, based on recent monitoring in Trail, SO<sub>2</sub> levels exceed the benchmarks for ambient air quality set for 2020. Short-term exposures to elevated SO<sub>2</sub> levels can cause the air passages in the lungs to constrict or tighten, leading to breathing difficulties and tightening in the chest. Symptoms may worsen during vigorous exercise or hard physical labour. Those most sensitive to the effects of elevated SO<sub>2</sub> include young children, elderly people, and persons with chronic respiratory disease, especially persons with asthma. In 2020, reducing potential health effects from SO<sub>2</sub> was identified as a priority area for work by the Program.

### What needs to be done:

- Continue to identify future and new parents and provide one-to-one education and supports on healthy child development to positively influence children's future outcomes.
- Identify children with elevated blood Pb levels via the voluntary blood Pb clinics and support them.
- Evaluate the influence of the Program in reducing community Pb exposure through population-level blood Pb data.

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<sup>8</sup> Health Canada, (2013). Final Human Health State of the Science Report on Lead. February 2013. Her Majesty the Queen in Right of Canada, represented by the Minister of Health, 2013.

<sup>9</sup> Ross Wilson & G. Mark Richardson, (2013). "Lead (Pb) is Now a Non-Threshold Substance: How Does this Affect Soil Quality Guidelines?" *Human and Ecological Risk Assessment: An International Journal*, 19:5, 1152-1171.

<sup>10</sup> The magnitude of the potential effect reflects the values reported in the literature. They should not be interpreted as definitive, but rather as an approximate indication of the relative importance of these factors.

- Ensure messaging on reducing exposure to Pb, as well opportunities for improving child outcomes, reaches baby groups, daycares, and family service providers.
- Ensure multiple channels for communicating how to manage potential effects from elevated levels of SO<sub>2</sub> are used.

#### THEP ambition:

THEP is a community leader and champion for health and early childhood development.

#### Milestones THEP partners will contribute toward achieving the ambition:

1. Annually, ensure at least 90% of the known families will receive a primary prevention in-home visit by the Public Health Nurse focused on Pb and SO<sub>2</sub> before each child's first birthday.
2. Annually, conduct outreach and support participation in IH's blood Pb testing clinics to maintain high participation rates.
3. Biennially, ensure that the in-home visiting team (Public Health Nurse and community program representative) continues to be known as a trusted source of knowledge on Pb and SO<sub>2</sub> in the community.

## 5.5 Community Connectedness & Leadership

*Issue:* There are many supports available to residents and investors in Trail to navigate the influence of proximity to an operating smelter. Understanding where to go for information and providing one 'window' to learn about the issues, ask questions or find support is important, but could be better known outside of existing networks. Community partnerships, along with the proactive and transparent nature of the Program, are critical to maintaining THEP's relationships and high participation rates in programs by families during the child-rearing years. Referrals and community connections are necessary for trust building, ensuring messaging gets to those who need it, and maintaining THEP's positive reputation in the community. While much was published throughout the 1990s and early 2000s on the work undertaken in Trail to understand Pb exposure in the community, there has been not been any updated or published research in the past twenty years. Being accessible to others outside of Trail to share knowledge and learning is important to the global community of cities and towns with operating lead smelters and mines facing similar challenges.

#### What needs to be done:

- Increase THEP's visibility and accessibility in the community beyond its core client base.
- Continually review and update the communications plan to identify traditional, as well as harder to reach, audiences such as indigenous groups, seniors, contractors, schools, and others.
- Ensure Program representatives are:

- sources of support in a variety of family-specific networks;
- sources of education for the development community; and
- present throughout the community as a positive addition to living in Trail and surrounding areas.
- Strengthen online visibility so THEP is recognized as a source of knowledge and experience locally and globally .

### THEP ambition:

THEP is known locally (and beyond) as a trusted partner in the community wellbeing of Trail and area.

### Milestones of THEP partners toward achieving the ambition:

1. Annually, keep abreast of the work of, and actively contribute to, other organizations whose work supports THEP goals.
2. Annually, identify and participate in at least five events/year to raise THEP's profile, improve connectedness, and demonstrate leadership.
3. By 2025, document the story of THEP's evolution and achievements for the public and science community (2001-2021).
4. By 2025, establish a community of practice / learning network to support knowledge sharing and learning between global actors facing similar challenges to THEP partners (e.g. potential members include BCCDC, Port Pirie, Broken Hill, Mount Isa, along with THEP).

## 5.6 Integration, Understanding and Creating Value Together

*Issue:* The complex challenges THEP addresses cannot be solved by one organization or government alone. The diversity of people and organizations engaged in THEP bring a range of perspectives, expertise, and history. This can be a huge benefit to gaining a shared understanding of the complex landscape everyone is working in. THEP was recognized in 2011 with a Premier's Award for Collaboration, acknowledging the successful collaborative approach. However, with geographical distance, diversity in subject matter expertise, along with turnover of the partner staff, Program team staff, and committee members, at times there are different understandings of the issues, missed synergies, and potentially reduced value for the community. Furthermore, as Pb in community air (measured by the air quality monitoring network) and health (measured by blood Pb levels) improves, understanding the pathways for Pb exposure in children becomes more challenging to decipher. It's important to understand dominant exposure pathways so that resources and programming are designed for maximum impact.

### What needs to be done:

- Commit to fostering a culture of knowledge sharing and learning with the partners, including regular communication and documentation.

- Improve onboarding of new staff and committee members to increase morale and the ability to contribute to Program ambitions.
- Ensure opportunities to build everyone’s understanding of the complex system the Program operates in (including all potential pathways for Pb exposure).
- Ensure activities suggested and/or taking place are appropriate to the local context and risks are identified and managed.

#### THEP ambition:

A greater understanding by all partners of the relative influence of smelter emissions on children’s blood Pb levels in the Trail Area is achieved.

#### Milestones of THEP partners toward achieving the ambition:

1. Annually, at the community program level, ensure that team members with varied expertise will continue to actively to seek opportunities for collaboration across subject matter (air, soil, health, and built environment).
2. Annually, have the THEP partners gather, reflect, document, and share publicly the lessons learned generated by the partners and Program team, with a focus on seeing the bigger picture.
3. By 2025, create and integrate into operations an onboarding process to welcome new Program staff and committee members.
4. By 2025, develop an accepted adaptive management framework to review and learn continuously from Program work.
5. Ongoing, advocate for participation of partners in studies that help better understand the health and environment of Trail (e.g. UBC teeth study, Trail Health Review Committee, etc.)

## 6.0 MONITORING

For each strategic area, measurable indicators of success will be developed.

## 7.0 FIGURES

Figure 1. Trend of Blood Pb Geomean by Area 1991-2021

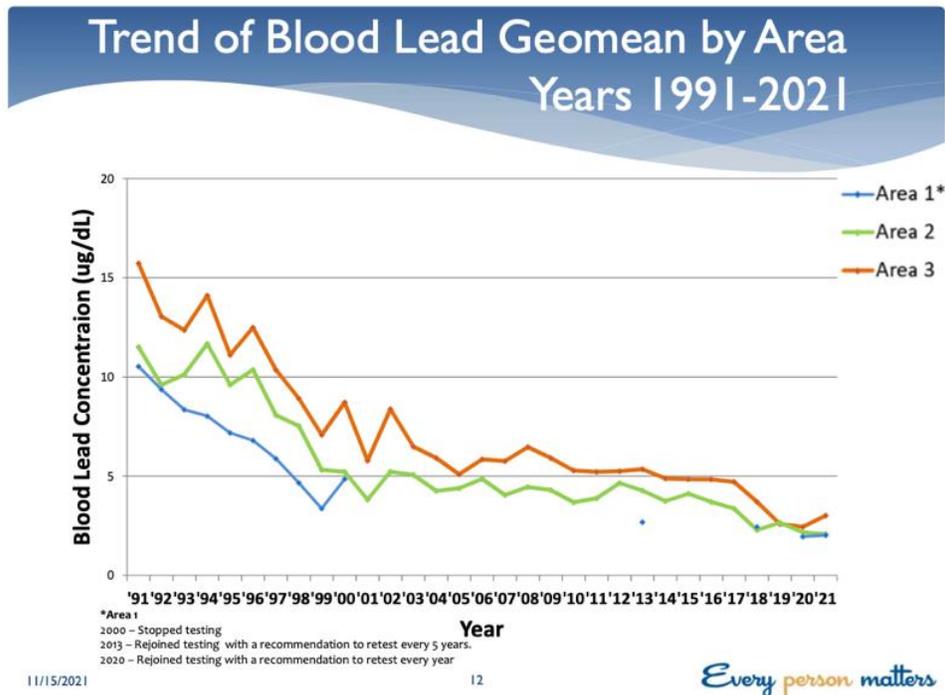


Figure 2. Annual average for Pb in community air from 1991-2021

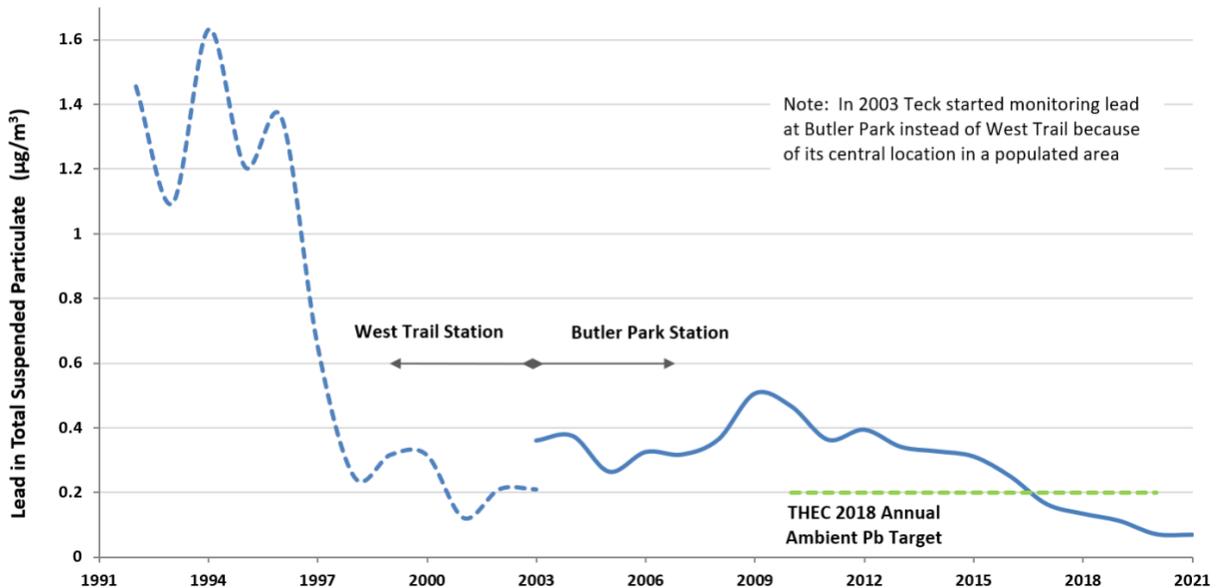
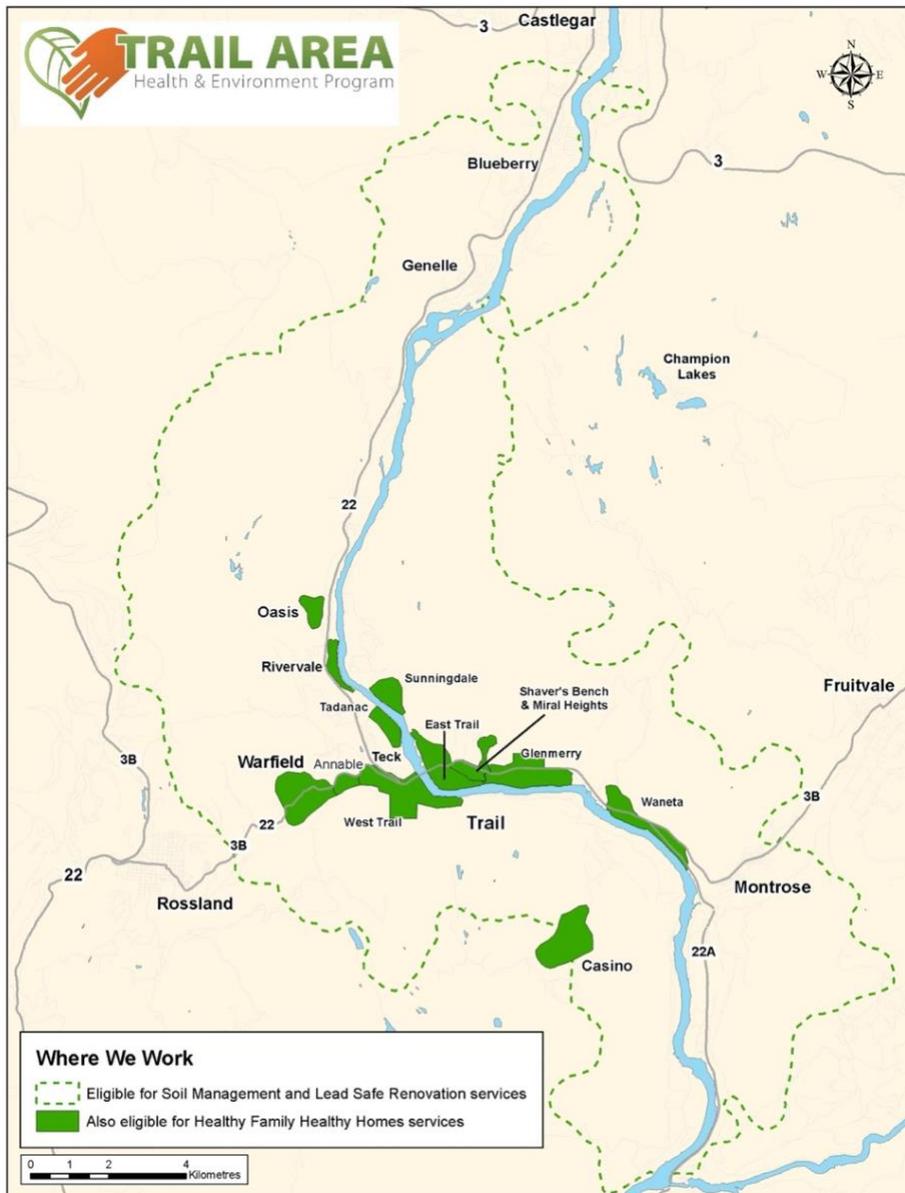


Figure 3. Sulphur Dioxide (SO<sub>2</sub>) in community air

Actual ambient SO<sub>2</sub> concentrations in Trail fluctuate throughout the day, month and year. Although levels fluctuate, monitoring data from recent years exceed the benchmarks for ambient air quality set by the Provincial and Federal governments that came into effect in 2020. Find current and historical data online at:

<http://www.env.gov.bc.ca/epd/bcairquality/readings/find-stations-map-SO2.html>

Figure 4. Program Area



THEP community programs serve Trail and surrounding areas in priority order. The focus and priority support is for communities closest to the smelter including Trail, Casino, Oasis, Rivervale, Waneta, and Warfield. Some programs are also available throughout the Lower Columbia Area and on the map within the green dashed line.

# **Program Reports & Updates**

# Air Quality Report & Working Group Update

## Air Quality Report

September 22, 2022

### 1. Lead in Air:

Averages for lead in air continue to be at historical lows; second quarter 2022 average for lead in air at Butler Park and Birchbank stations were 0.043  $\mu\text{g}/\text{m}^3$  and 0.048  $\mu\text{g}/\text{m}^3$ , respectively.

As seen in the monthly averages in Figure 2, month to month variability in ambient levels remains relatively low, but the influence of weather including dominant wind direction and precipitation, can be seen in the data.

Figure 3 presents the 3-month rolling average for lead in air measured at the Butler Park station compared to the US EPA standard of 0.15  $\mu\text{g}/\text{m}^3$  (Federal and BC Provincial governments do not have ambient air quality objectives or standards for lead; however, it is reasonable to rely on standards from other jurisdictions when this is the case). Lead in air levels measured at Butler Park and Birchbank meet the US EPA standard of 0.15  $\mu\text{g}/\text{m}^3$  on a 3-month average.

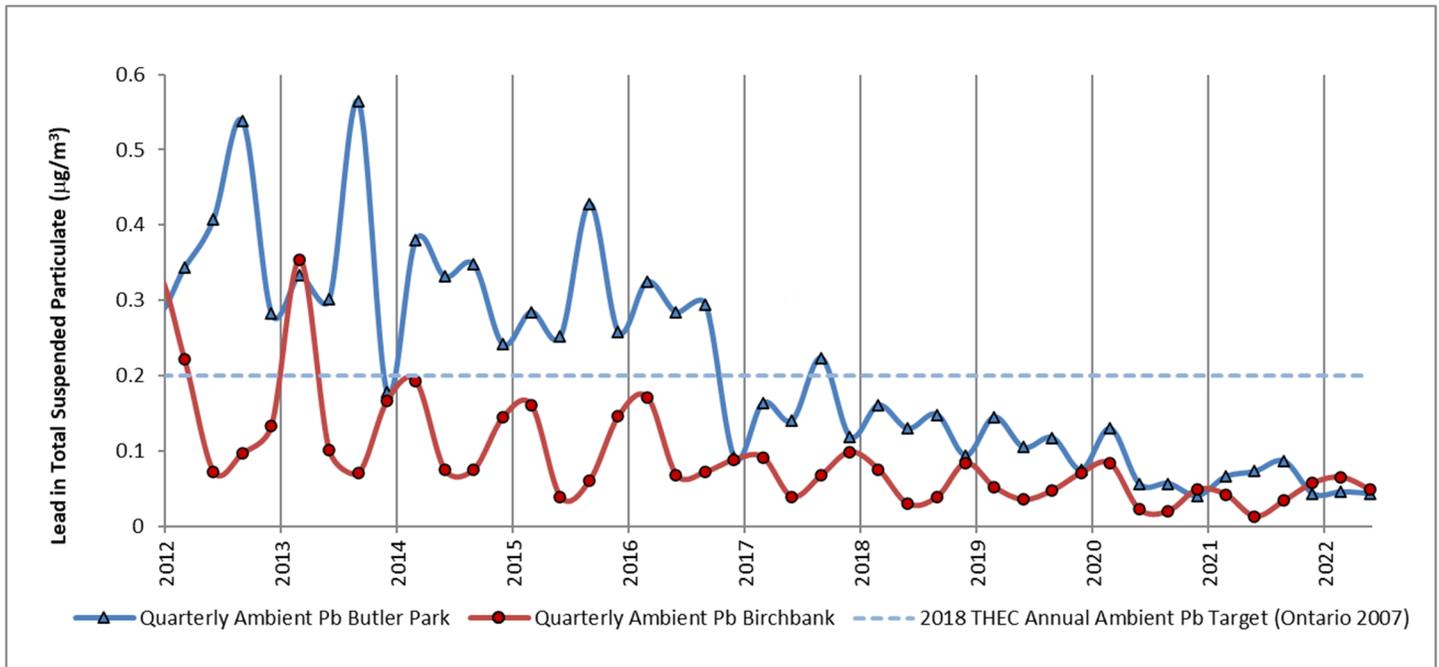


Figure 1: Quarterly monthly average lead at Butler Park and Birchbank stations (as total suspended particulate measured bi-daily)

The chart in Figure 1 shows quarterly averages for Lead in air for Butler Park (dark blue) and Birchbank (red), in comparison to the 2018 THEC Annual Ambient Lead in Air Objective (dashed line).

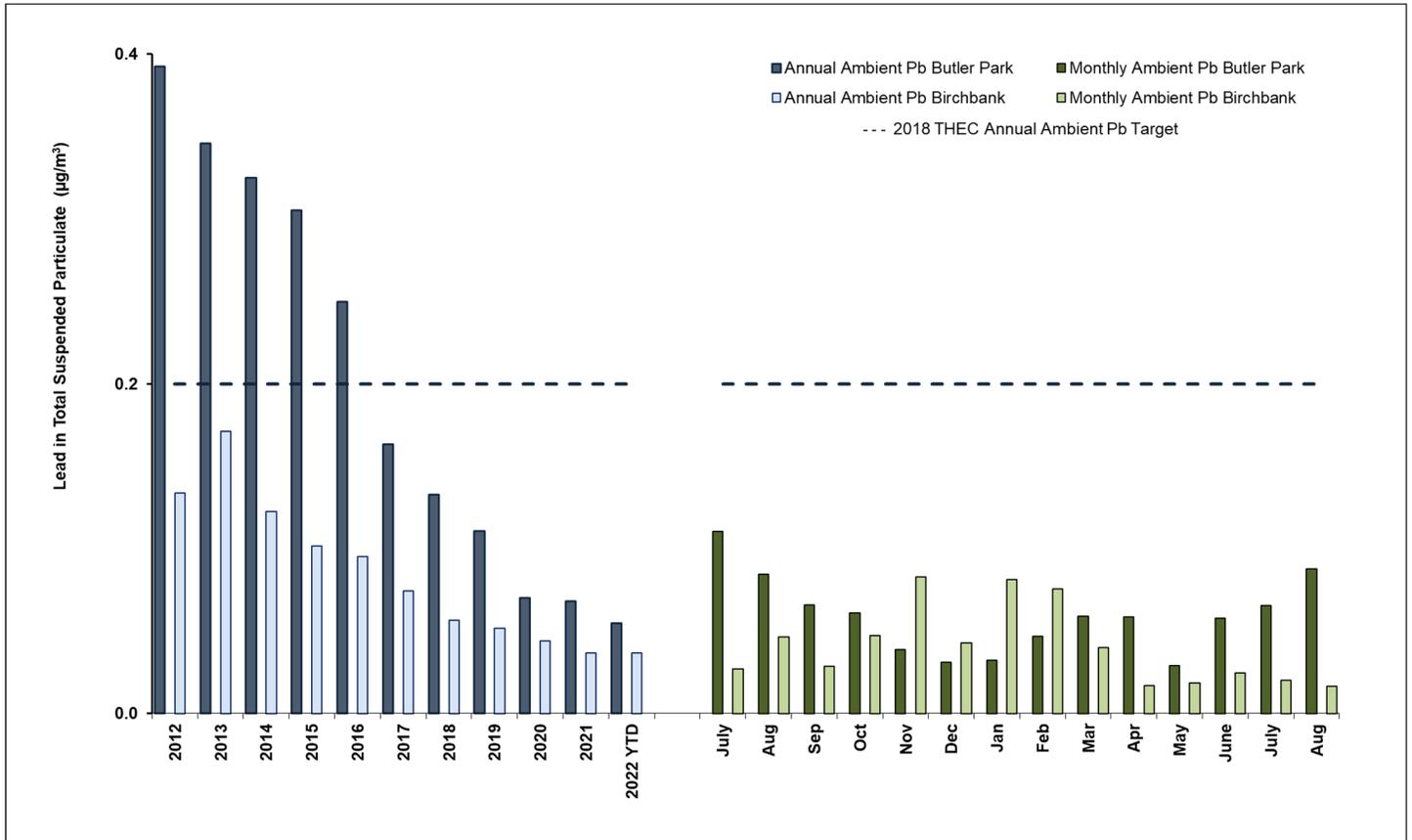


Figure 2: Annual and monthly average lead at Butler Park and Birchbank stations (as total suspended particulate measured bi-daily)

The chart in Figure 2 shows annual and monthly averages for Lead in air for Butler Park. Annual averages are shown on the left for Butler Park (dark blue) and Birchbank (light blue). Monthly averages for the past year are shown on the right for Butler Park (dark green) and Birchbank (light green). The 2018 THEC Annual Ambient Lead in Air Target is shown as a dashed line. Monthly averages for Lead in ambient air are expected to have some variability due to season, weather, predominant wind direction and operational variance.

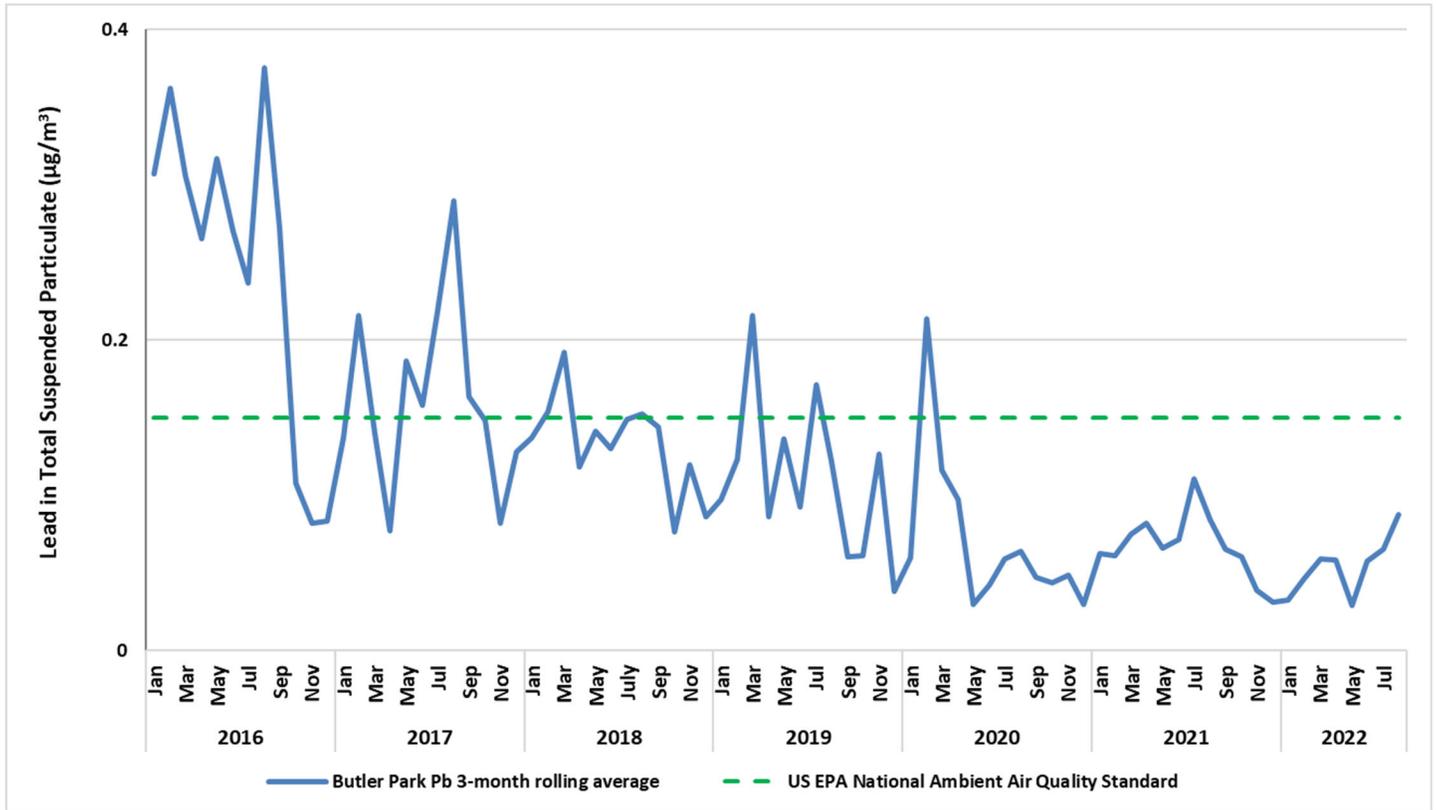


Figure 3: 3-month rolling average lead in air at Butler Park station (as total suspended particulate measured bi-daily)

The chart in Figure 3 shows the 3-month rolling average for lead in air for Butler Park (blue line), in comparison to the US EPA standard (green dashed line).

## 2. Arsenic in Air:

Averages for arsenic in air continue to be at historical lows. Second quarter 2022 arsenic in air at Butler Park and Birchbank were  $0.003 \mu\text{g}/\text{m}^3$  and  $0.004 \mu\text{g}/\text{m}^3$ , respectively.

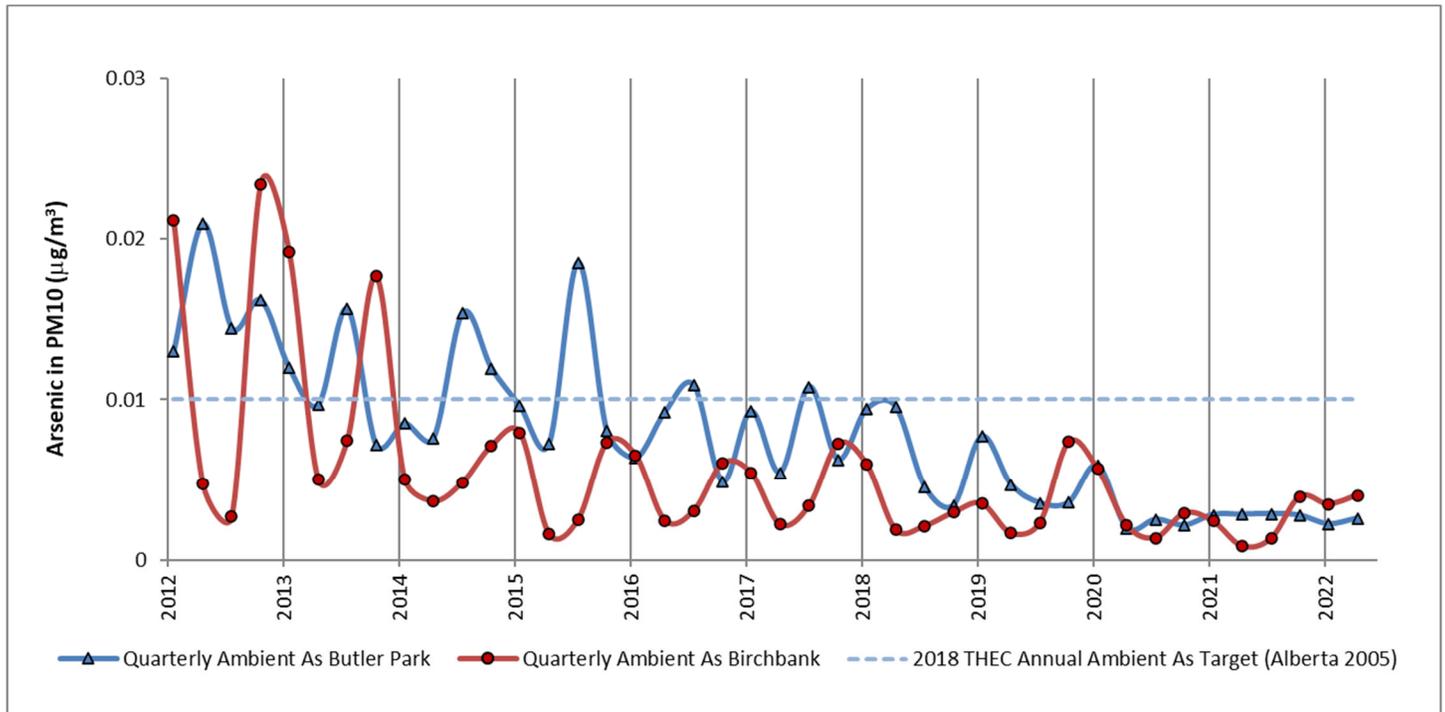


Figure 4: Quarterly average arsenic at Butler Park and Birchbank stations (as inhalable PM<sub>10</sub> fraction measured weekly)

The chart in Figure 4 shows the annual average for Arsenic in air (measured as inhalable PM<sub>10</sub> fraction) at Butler Park (blue) and Birchbank (red) in comparison to the 2018 THEC Air Quality Objective (blue line).

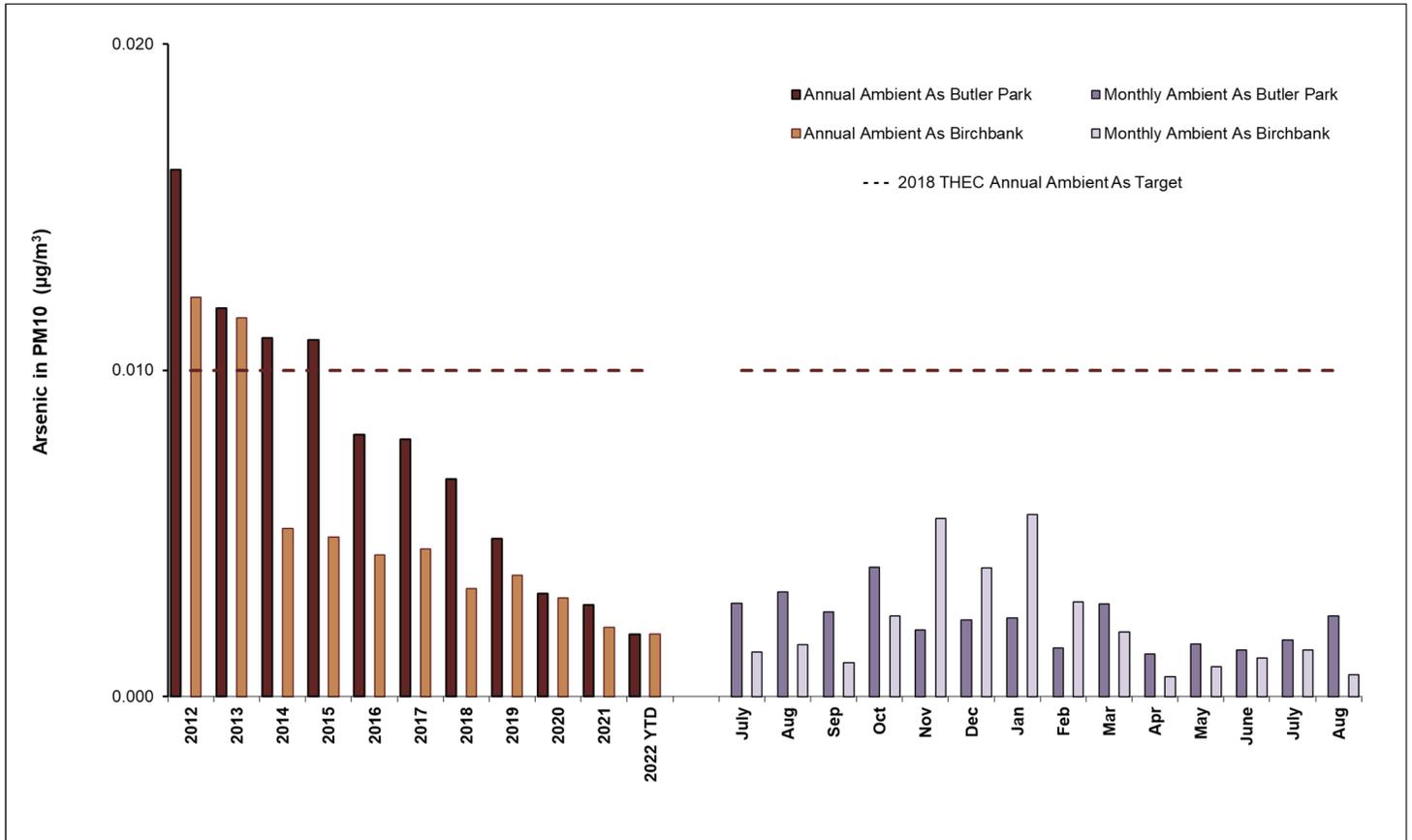


Figure 5: Annual and monthly average arsenic at Butler Park and Birchbank stations (as inhalable PM10 fraction measured weekly)

The chart in Figure 5 shows annual and monthly averages for Arsenic in air at Butler Park and Birchbank. Annual averages are shown on the left for Butler Park (dark brown) and Birchbank (light brown). Monthly averages for the past year are shown on the right for Butler Park (dark purple) and Birchbank (light purple). The 2018 THEC Air Quality Arsenic in Air Target is shown as a dashed line. Monthly averages for Arsenic in ambient air are expected to have some variability due to season, weather, predominant wind direction, operational variance and sampling frequency.

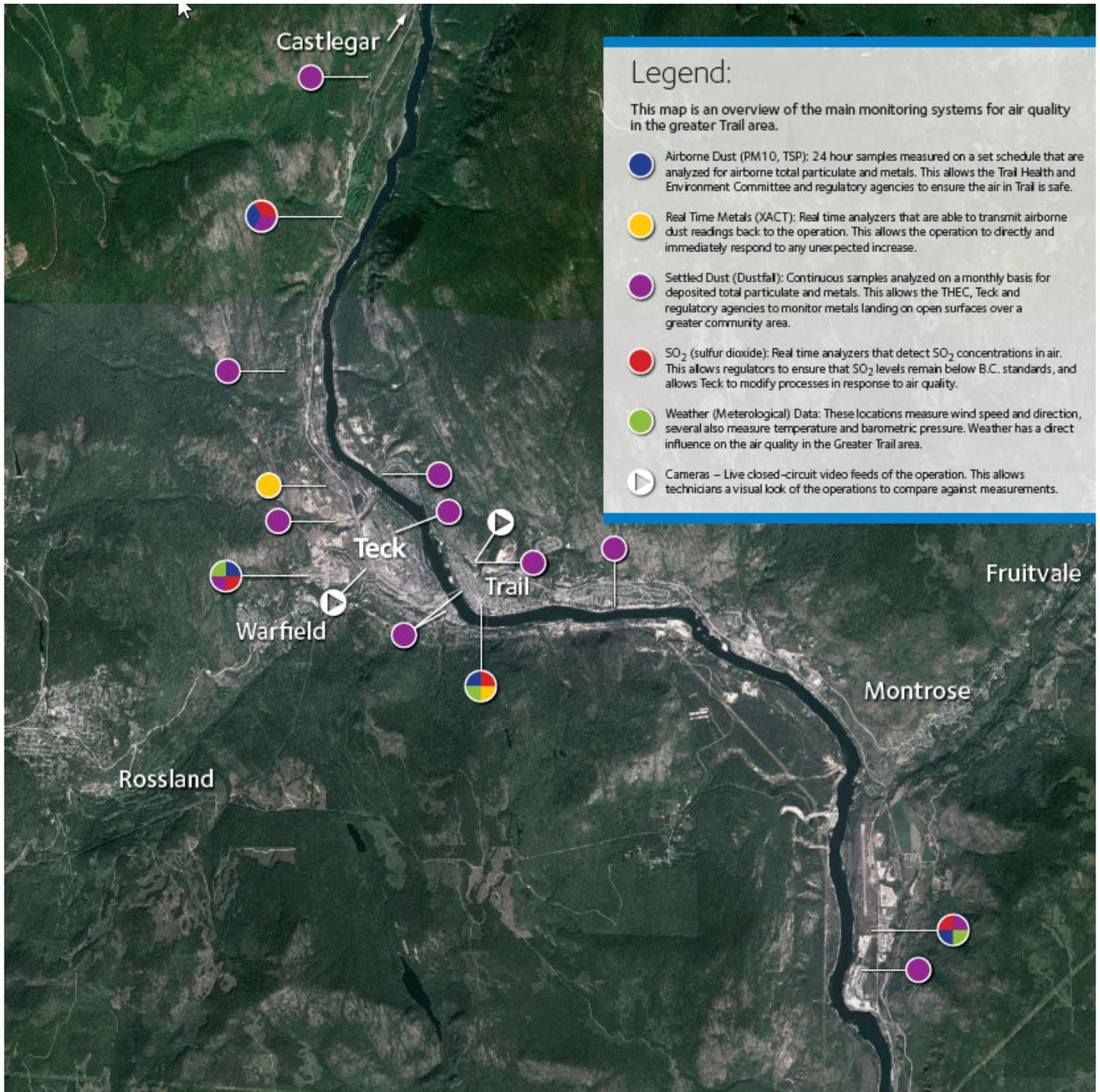


Figure 6: Teck Community Air Monitoring Stations

# Family Health Report



## FAMILY HEALTH REPORT

September 22, 2022  
RECENT HIGHLIGHTS

1. Fall 2022 Blood Lead Clinics In Progress
2. Healthy Family Visits
3. Community Outreach

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## ADDITIONAL DETAILS

1. Fall 2022 Blood Lead Clinics are underway. Two remaining clinic days:
  - September 26, 2022 11am-6pm
  - September 28, 2022 9am-4pm
2. Healthy Family Visits
  - 53 Healthy Family visits completed in 2022, 4 declined.
  - So far in 2022 11 Visits have been completed as Home Visits, 41 visits at Kiro and one over the phone with a package then mailed out.
  - Trying to return to Home Visiting model, though still offering in office visits for families that prefer this method.
3. Community Outreach
  - Meghan to attend Building Beautiful Babies Monthly. Attended on Sept 15<sup>th</sup>.
  - Cecilee to attend Muffins and Munchkins monthly. Attended on Sept 21<sup>st</sup>.
  - Planning Fall 2022 daycare outreach with Wendy
  - Participated in walking tour with new THEC Committee Members and Program team members
  - COINS connection made through meeting with Wendy and Maurice Trudel, Aboriginal Health Coordinator.

# Home & Garden Report

September 22, 2022

**HIGHLIGHTS**

**1. Soil Management Program:**

- a. Soil Assessment – 40 Properties with Children , 65 Community Properties and 2 Veg Gardens have been tested this year. 39 properties remain in the queue for sampling (5 have children).
- b. Yard Improvement – 11 properties have had lawn care, 20 have received improvement including soil pickup or delivery, mulch cover, etc. and 6 are planned for yard improvement this fall.
- c. Soil Replacement – 58 yards and 3 vegetable gardens have had soil replaced. 22 properties are planned. The final number of properties to receive soil replacement will depend on weather and pace for the rest of the year.

**2. Healthy Homes:**

- a. Healthy Homes
  - i. 43 home visits have been completed this year.
  - ii. We are attending all the fall Blood Lead clinics as an opportunity to connect with families.
- b. Enhanced supports
  - i. Residential Lead Inspection (RLI) results have been sent to participants following summer dust sampling.

**3. Lead Safe Renovation:**

- a. Since the last THEC meeting, another 14 residents have accessed the Lead Safe Renovation Program for supplies, bringing the yearly total to 47.
- b. We are still experiencing shortages and long waits for some LSR supplies and are considering alternate methods of distribution to avoid these issues in the future.
- c. Updated rack cards have been provided to realtors in the area as well as the Regional District office (who issues building permits).

**4. Outreach and Engagement:**

- a. Our staff co-facilitated the first Three and Thriving Conversation Café in support of the Family Action Network.
- b. Our program was happy to set up at the Trail IncrEdible Farmers Market again this September to sign up community members for programs and answer questions from the public.

- c. We joined the Buddy Circle at the Trail Library summer reading club for a story and craft to connect with families.
- d. We are using the downtown message board to relay important information. For example to encourage soil testing in May and with messaging related to planning yard work early in August.
- e. THEP has Healthy Habits radio and digital ads from May-September. The digital ads had higher than average click through rates which drives people to the website.