



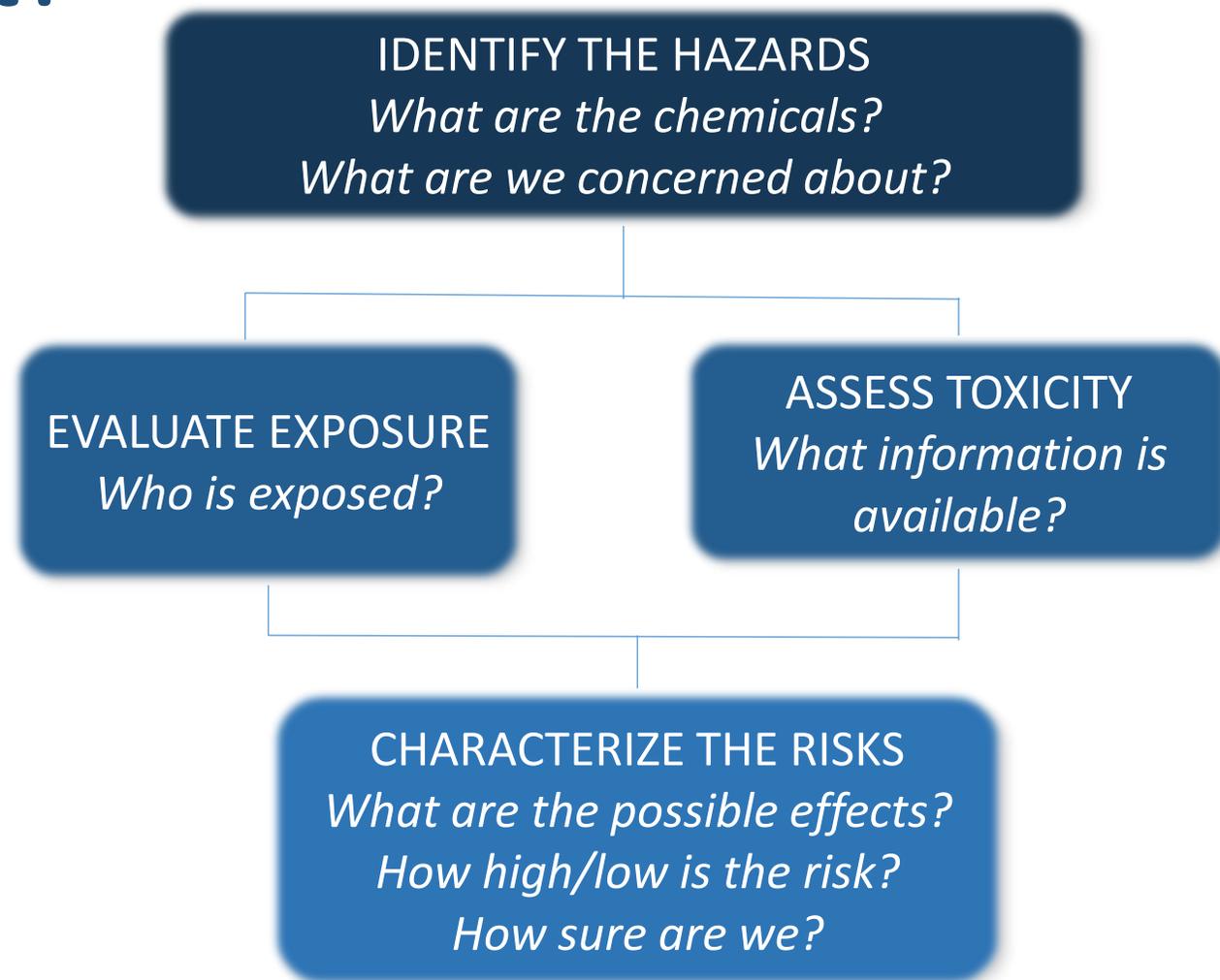
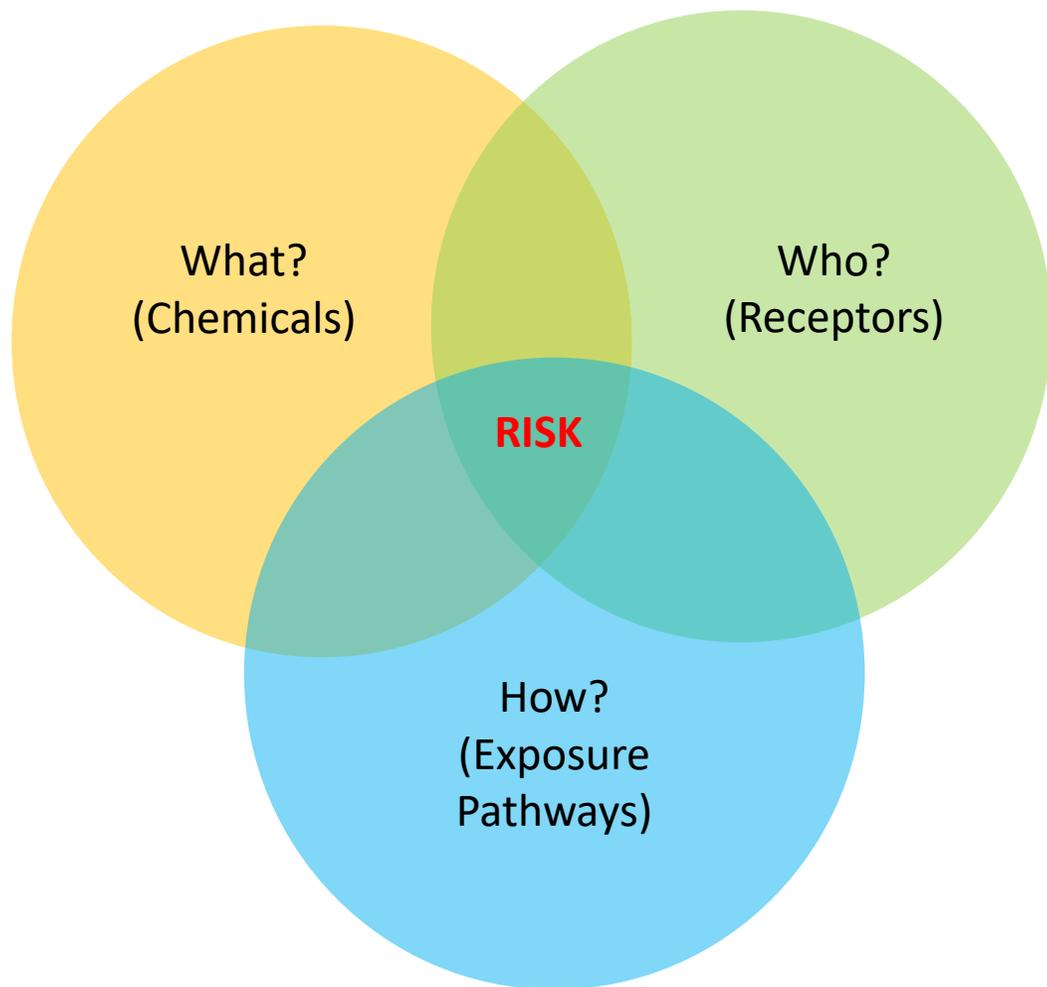
Sarnia Area Environmental Health Project *Air Exposure Review*

Update on Progress to Date

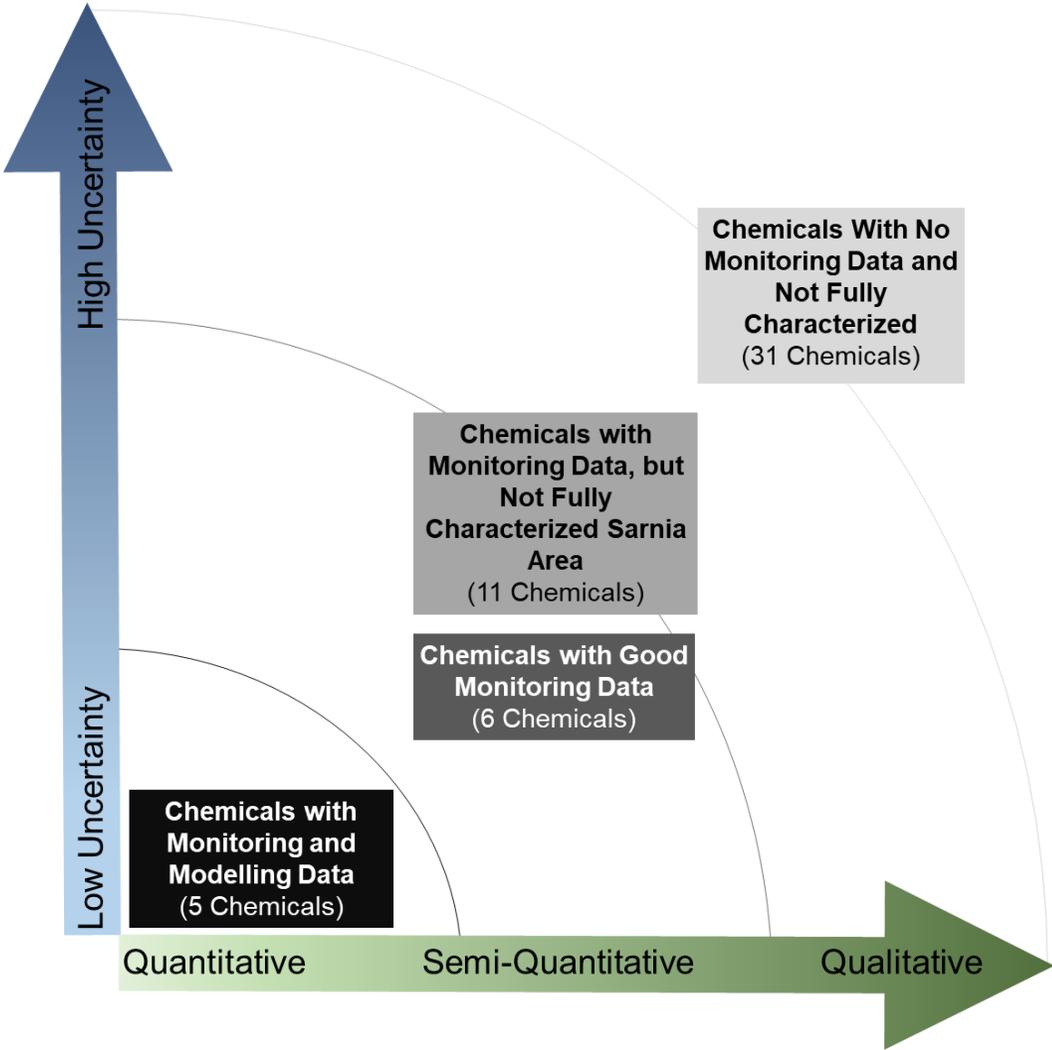
Community Information Meeting

November 2021

What is Risk Assessment?



Path Forward for Assessment of Chemicals



Chemicals Selected for Assessment

Quantitative COPCs [Modelled data across Sarnia]

- Benzene
- Benzo(a)pyrene
- Butadiene (1,3-)
- Fine Particulate Matter (PM_{2.5})
- Sulphur dioxide

Semi-Quantitative COPCs

[Monitoring data at two locations]

- Cyclohexane
- Ethylbenzene
- Hexane (mixture of isomers)
- Nitrogen oxides
- Toluene
- Xylenes

[Monitoring Data at one location]

- Carbon monoxide
- Chromium
- Cyclopentane
- Iron and compounds
- Lead
- Manganese
- Methylene chloride
- Naphthalene
- Nickel
- Total Reduced Sulphur (TRS)
- Trimethylbenzenes

Qualitative COPCs [No modelling or monitoring data]

- Acetonitrile
- Acrolein
- Ammonia
- Bis(pentamethylpiperdiny)sebacate
- Chromium Compounds (hexavalent forms)
- Cobalt and Compounds
- Cyclohexane, 5-isocyanato-1-(isocyanatomethyl)-1,3,3-trimethyl-, homopolymer
- Diaminodicyclohexylmethane (4,4'-)
- Diaminopolypropylene glycol
- Diethanolamine
- Ferric oxide
- Formaldehyde
- Gasoline
- HDI Polyisocyanate (HDI-BT & HDI-IC)
- Hexamethylene diisocyanate (HDI) monomer
- Hexane (n-)
- Hydrogen chloride
- Kerosene
- Light aromatic solvent naphtha (petroleum)
- Methanol
- Methyl ethyl ketone (2- Butanone)
- Methyl-2-hexanone, 5-
- Mineral Spirits
- Phosphoric acid
- p-Toluenesulfonyl isocyanate
- Silica - respirable (<10 µm diameter), quartz
- Sulphuric acid
- Talc – fibrous
- Tri(dimethylaminomethyl)phenol (2,4,6-)
- Triethylene tetramine
- Tungsten

Selection of Comparison Benchmark Values

- To evaluate potential health risk, the measured or modelled air concentrations will be compared to established chemical-specific benchmark values.
- These are typically health-based exposure concentrations established by reputable regulatory agencies based on exposures studies with these chemicals on animals or humans.
 - Agencies such as MECP, US EPA, Health Canada, ATSDR, WHO, CalEPA, and TCEQ.
- These benchmarks include uncertainty factors to ensure they are conservative to avoid the underestimation of health risks. Frequently they are established to protect the most sensitive members of the population (*i.e.*, asthmatics, the elderly, immunocompromised, *etc.*).
- Regulatory agencies typically use these benchmarks to set air quality standards or as part of regulation of emissions within airsheds.

Benchmark Values Selected to Assess Chemicals

- In the AER we have quantitative data (either modelling or monitoring) to assess 22 chemicals.
- A detailed regulatory and literature review has been conducted to select health-based benchmarks to assist in the evaluation of potential risk to Sarnia residents for these chemicals.
- Benchmarks were selected for short-term (acute) and long-term (chronic) exposures and their potential health effects (cancer and non-cancer), where available/appropriate.
- These values have been presented to the Government Air Exposure Review Panel (GAERP) for feedback.

Assessment of Potential Health Risks

- We are currently conducting the *risk characterization* step where we compare exposure concentrations to the established benchmarks.
- If modelled or measured air concentrations exceed the selected benchmark, this indicates the need for further investigation and potential mitigation.
- Additional context can be provided for the five quantitative chemicals, if necessary, by evaluating:
 - A breakdown of emission sources for the chemical within the air shed;
 - The frequency of exceedances;
 - Where exceedances might occur within the Study Area and the probability that an exceedance may occur at a given location; and,
 - What specific health outcome may be expected and to what sensitive population.

What tasks are currently in progress?

- We are currently midway in our work for the Air Exposure Review component of the Study:
 - Finalizing the health-based benchmarks for each of the quantitative/semi-quantitatively evaluated chemicals.
 - Determining appropriate approach for qualitative chemicals for which no exposure data is available.
 - Initiating the risk characterization step where we evaluate potential health implications.
 - Developing graphical representations of predicted air concentrations of the five key quantitative chemicals across Sarnia.
 - Continued consultation with the GAERP and Study Advisory Committee at each step.
 - Ongoing communication and engagement activities.
- Draft results of the AER are expected to be discussed with the community at our next community meeting.



Miigwetch and Thank You!

Questions and Feedback?