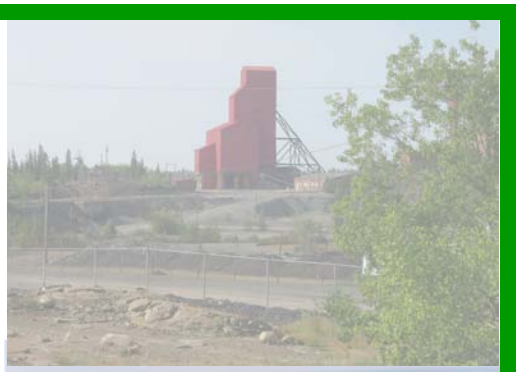
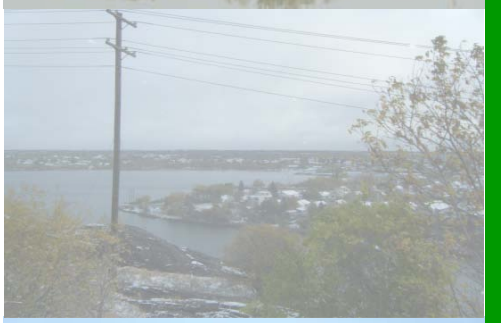


APPENDIX J

GLOSSARY OF TERMS



APPENDIX J: GLOSSARY OF TERMS

95th Percentile	The 95th percentile of a set of measurements is the value below which 95% of the results fall.
95% Upper Confidence Limit of the Mean (95%UCLM)	The upper bound estimate on the value of the mean of a normally distributed sample parameter that one can be confident (at a specified level) is not exceeded by the true mean of the population.
Absorbed Faction	The fraction of an inhaled or swallowed compound that is absorbed into the blood stream. See also Bioavailability and Bioaccessibility.
Absorption	The process of assimilating one material into another (*i.e.*, when a sponge takes up water). Metals can also be absorbed into the bloodstream and transported to various body organs after breathing or inhaling airborne dust or swallowing dust and soils. Rarely, metals might be absorbed through the skin into the bloodstream and then transported to other organs. However, this is not the main source of absorbed metals in their various forms.
Acceptable Daily Intake (ADI)	Estimated maximum amount of an agent, expressed on a body mass basis, to which individuals in a (sub)population may be exposed daily over their lifetimes without appreciable health risk.
Acceptable Risk	A risk management term. The acceptability of the risk depends on scientific data, social, economic, and political factors, and the perceived benefits of producing or using a product associated with exposure to an agent.
Acute	Occurring over a short time. An acute or short-term exposure can result in short term or long-term health effects. An acute effect happens within a short time after an exposure (*i.e.*, may be minutes or days).
Acute Exposure Limit	The amount or dose of a chemical that can be tolerated by humans without evidence of adverse health effects on a short-term basis
Additivity	Consequence which follows exposure to two or more physico-chemical agents which act jointly but do not interact: commonly, the total effect is the sum of the effects of separate exposure to the agents under the same conditions. Substances of similar action may show dose or concentration addition.

Adverse Health Effect	A change in body function or cell structure that might lead to disease or health problems.
Antagonism	A phenomenon where two or more agents in combination have an overall effect which is less than the sum of their individual effects. In biochemistry and toxicology, the term commonly refers to interference in the physiological action of a chemical substance by another having a similar structure or chemical behaviour.
Background Level	A typical or average level or concentration of a chemical or substance in the environment. Background often refers to naturally occurring or uncontaminated levels, and it should be noted that these vary from one location to another.
Benchmark	A regulatory agency target against which predictions of risks are assessed.
Bioaccessibility	The mass fraction of a substance that is converted to a soluble form, and is therefore potentially available for uptake, under conditions of the external part of the membrane of interest. If one is evaluating bioaccessibility *via* the oral route, it is the fraction of a substance that becomes solubilized within the gastrointestinal tract (*i.e.*, stomach and small intestine). This may also include the fraction of the substance, in the form of ultrafine (nano) particles, which is translocated directly into cells or the blood circulation. In the case of dermal exposures, it is the fraction solubilized on the outside of the skin (*i.e.*, in sweat). See Relative Bioaccessibility.
Bioavailability	The fraction of a substance to which an organism has been exposed that is absorbed into the blood stream. The bioavailable fraction is also sometimes referred to as the absorbed fraction or f_{abs}. Absolute bioavailability refers to the fraction or percentage of a chemical that is ingested, inhaled or applied to the skin that is absorbed and reaches systemic blood circulation. Relative bioavailability, as it pertains to risk assessment, has been defined as the difference in absorption of a chemical from the environmental medium of concern (*e.g.*, food, soil and/or water) *versus* the absorption from the vehicle (or medium) used in the toxicological study from which the toxicity-based reference value is derived.
Biological Monitoring	Measuring either chemicals or the various by-products they produce in the body by sampling biological materials (blood, urine, breath, *etc.*). The prime objective of biological monitoring is to obtain measurements of chemical exposure in humans, animals or plants.

Cancer Slope Factor / Unit Risk Cancer Estimate (q1*, SF)	A measure of the relationship between exposure to a carcinogen and the increased risk of cancer, and corresponds to risk per unit of exposure. The cancer slope factor is used to estimate the increased risk of cancer resulting from a lifetime of exposure to a substance.
Carcinogen / Carcinogenic	A substance or chemical that can cause cancer. Knowledge that a chemical or substances can cause cancer is usually obtained from laboratory studies in animals. Only infrequently do we know that a substance definitely causes cancer in humans. Sometimes the cancer effect is dependent on the type of exposure.
Centers for Disease Control and Prevention (CDC)	A major operating component of the U.S. Department of Health and Human Services, responsible for public health efforts to prevent and control infectious and chronic diseases, injuries, workplace hazards, disabilities, and environmental health threats.
Central Tendency Estimate (CTE)	A statistic that represents the most likely, most common or average value for a population; provides an indication of the middle point of distribution for a particular group. The mode, the median and the mean are the commonly used central tendency statistics.
Chronic	Occurring over a long period of time, several weeks, months or years, depending on the exposed species.
Chronic Exposure Limit	Amount or does of a chemical that people can be exposed to without experiencing ill effects, even when exposure occurs continuously or regularly over extended periods (*e.g.*, longer than a year).
Concentration	The proportion of one substance contained in a given amount of a specific media. The unit is a concentration unit which has two components: the numerator (*i.e.*, quantity of chemical present) and the denominator (*i.e.*, quantity of the media or volume of solution in which the chemical is present). For example, an arsenic soil concentration of 10 mg/kg (*i.e.*, 10 ppm) represents 10 mg of arsenic present within 1 kilogram of soil.
Concentration Ratio (CR)	The concentration is similar to the hazard quotient, where the exposure and exposure limit are expressed as concentrations (rather than as doses). See Hazard quotient.
De minimis	From the Latin '*de minimis non curat lex'* ('the law does not concern itself with trifles'), this term refers to a very small level of risk. In Canada, incremental lifetime cancer risks in the range of 1-in-a-million ($1x10^{-6}$) to 1-in-a-hundred-thousand ($1x10^{-5}$) are usually considered de minimis. Also see Acceptable risk.
Dermal	Referring to the skin. For example, dermal absorption means absorption through the skin.

Detection Limit	The lowest amount of substance that a laboratory can reliably measure using a specific analytical technique. Detection limits are usually defined in relation to a particular measurement methodology of a laboratory. The concentration of a chemical is measured in a sample of air, water, soil or other medium. Whether or not a chemical can be shown to be present in a measurable concentration depends on the detection limit. The detection limit seldom, if ever, denotes a concentration of zero.
Deterministic / Deterministic Risk Assessment	Refers to a mathematical approach commonly used to estimate exposures in risk assessments. In a deterministic risk assessment, each variable (for example body weight, inhalation rate, time spent indoors per day) is assigned a single value. See also Probabilistic / Probabilistic risk assessment.
Dose	The amount of chemical or substance taken in or absorbed by an exposed individual. Dose often takes body weight into account. For example, to receive equivalent doses of medicine, children are given smaller amounts than adults. The unit is mg/kg for example. The dose rate is the frequency that the dose is applied, such as "mg/kg body weight per day". Acute toxicity usually refers to single doses, while chronic toxicity refers to given dose rates.
Dose-Response Relationship	The relationship between the amount of a substance absorbed (*i.e.,* dose) and the resulting changes in body function or health (*i.e*., response).
Epidemiology	The study of disease in human populations. An epidemiological study often compares two or more groups of people who are as alike as possible, except for the factors being investigated. The factor could be exposure to a chemical or the presence of a health effect. The investigators try to determine if any factor is associated with the health effect outside of what may be considered "chance". Note: Epidemiologic studies do not prove the "cause" of the health effect, they measure an "association" between the health effect and various factors. The true cause of any adverse effect is determined by the amount and quality of evidence available from many sources such as clinical medicine, toxicology, cellular biology, chemistry, *etc*.
Essential Metal	An essential metal is a metal required by the body for normal healthy function. It must have a specific role in an enzyme or cofactor, and a deficiency should produce a disease or impairment of function.
Estimated Daily Intake (EDI)	The total exposure to a substance that is estimated to occur each day, considering all exposure media (for example, food, water, air and soil) and routes (*e.g*., swallowing, inhaling or coming into skin contact).

Exposure	Exposure is any contact with a chemical by swallowing, breathing or direct contact (such as through the skin or eyes). Exposure may be either short term (acute) or long term (chronic). Exposure can vary greatly, and is often associated with specific activities or behaviours of people or ecological organisms. It is quantified as the amount of a substance that can be absorbed, or the amount available for inhalation or ingestion.
Exposure Assessment	A process that estimates or measures the amount of a chemical or substance that enters or comes into contact with a person or ecological organism. An exposure assessment also takes into consideration the length of time and the nature of a population exposed to a chemical.
Exposure Limit	Maximum dose or amount of chemical that a person can be exposed to for a specified period without experiencing an adverse effect.
Exposure Pathway	The pathway a chemical, substance or agent may take to reach or cause exposure of humans or other living organisms. Pathways link a source of a chemical, substance or agent (*i.e.*, soil) to its eventual entry into the body.
Exposure Point Concentration (EPC)	The concentration of a chemical in any environmental medium (*i.e.*, air, food, water, *etc.*) to which a receptor could reasonably be expected to be exposed over an extended period of time.
Exposure Route	The route through which a substance can enter the body. Inhalation (breathing), ingestion (swallowing) and dermal contact (skin contact) are the three exposure routes considered in this document.
Exposure Scenario	A combination of facts, assumptions, and inferences that define a discrete situation where potential exposures may occur. These may include the source, the exposed population, the time frame of exposure, microenvironment(s), and activities. Scenarios are often created to aid exposure assessors in estimating exposure under varying conditions.
Exposure Unit (EU)	A discrete area, with specific exposure characteristics, delineated for evaluating within the assessment process. For example, each of the communities in the HHRA are considered EUs for the purpose of establishing potential health risks and risk management action (if required) for each of the COCs.

Extrapolation	A mathematical technique for using data from a situation that has been studied to gain insights about one that has not. Three kinds of extrapolation are commonly seen in risk assessments: 1) health effect data obtained in animal experiments can be extrapolated to understand health effects of a substance in humans; 2) a chemical's effects at high doses are often used to make predictions about effects at lower doses; and, 3) a chemical's effects following exposure *via* one exposure route are sometimes used to make predictions about effects following exposures *via* other routes.
Hazard	Inherent property of an agent or situation having the potential to cause adverse effects when an organism, system, or (sub) population is exposed to that agent or situation.
Hazard Quotient (HQ)	The ratio of estimated site-specific exposure to a single chemical over a specified period to the estimated daily exposure level, at which no adverse health effects are likely to occur. This risk characterization metric is typically used in the evaluation of non-carcinogenic chemicals. Also known as an exposure ratio (ER).
Health Assessment	A process to determine the health impacts related to particular events or circumstances, such as the release of a chemical, substance or agent into the environment. It includes a health interpretation of all the information known about the situation. The information may include some or all of the following: site investigation (environmental sampling and studies), exposure assessment, risk assessment, biological monitoring and health effects studies. The information is used to advise people how to prevent or reduce their exposures, to determine if remedial actions are necessary, or the need for additional studies. The types of studies carried out in a health assessment can include studies of the environment (soil measurements, chemical availability, *etc*.) or studies of the people living in the environment (epidemiological studies or biological monitoring studies).
Health Canada	The department of the government of Canada responsible for helping Canadians maintain and improve their health. Health Canada administers many pieces of legislation and develops and enforces regulations under this legislation that have a direct impact on the health and safety of Canadians. Health Canada also prepares guidelines in order to help interpret and clarify legislation and regulations.
Human Health Risk Assessment (HHRA)	A risk assessment focused on estimating potential human health risks to a defined set of individuals from exposure to a particular agent or agents. The HHRA process includes four basic steps: problem formulation (hazard identification), exposure assessment, hazard assessment, and risk characterization.
Incremental Lifetime Cancer Risk (ILCR)	The predicted risk of an individual in a population of a given size developing cancer over a lifetime as a result of exposure to a particular agent or agents at a specified daily rate over a lifetime of 70 years. The ILCR is calculated by multiplying the lifetime average daily dose by the cancer slope factor (q1*).

Ingestion	Taking a substance into the body by swallowing it, whether incidentally or purposely.
Inhalation	Breathing or inhaling air, and the substances it contains, into the lungs.
Integrated Exposure Uptake Biokinetic Model (IEUBK)	The IEUBK model is a computer model developed by the U.S. EPA to model exposure from lead in air, water, soil, dust, diet, paint, and other sources. It uses pharmacokinetic modelling to predict blood lead concentrations (PbB) in children 6 months to 7 years old.
In vitro	In an artificial environment outside a living organism or body. For example, some toxicity testing is done on cell cultures or slices of tissue grown in the laboratory, rather than on a living animal.
In vivo	Within a living organism or body. For example, some toxicity testing is done on whole animals, such as rats or mice.
Lifetime Average Daily Dose (LADD)	Estimated average dose, expressed on a body mass basis, to which individuals in a (sub) population may be exposed to daily over their lifetimes. The LADD is calculated based on the predicted exposure for each individual age class (*i.e.*, infant, toddler, child, teen, adult) weighted according to the age class duration (*i.e.*, 0.5, 4.5, 7, 8, and 60 years, respectively.
Lowest Observed Adverse Effect Level (LOAEL)	The lowest dose in an experiment which caused an adverse effect.
Market Basket	The amounts of different foods and beverages that are consumed by a person during a specific period of time.
Media	Soil, water, air, plants, animals or any other parts of the environment that can contain chemicals, agents or substances. Body tissues or fluids such as blood, bone or urine may also be media. The singular of "media" is "medium."
Metabolism	All the naturally occurring chemical reactions within the body that enable the body to work. For example, food is metabolized (chemically changed) to supply the body with energy. Chemicals can be metabolized and made either more or less harmful by the body. In general, metabolism makes chemicals less harmful (detoxifies substances). Occasionally, metabolism can activate a chemical to increase its potential to do biological harm.

Mode of Action	The mode of action of a substance is defined as the general recognition of the broad biochemical pathways (such as DNA synthesis, protein synthesis, cholesterol synthesis) which are inhibited or affected by a substance. The mode of action is distinguished from the mechanism of action of a substance, which is defined as the mechanism by which a toxicologically active substance produces an effect on a living organism or in a biochemical system. The mechanism of action is usually considered to include an identification of the specific targets to which a toxicologically active substance binds or whose biochemical action it influences.
Modelling	The process by which scientists consider many scenarios of exposure for the purpose of determining the associated health risks. A selected scenario may be preferred for a given site when information is known about the site and about the behaviour of the chemical or substance. In most cases modelling involves the use of mathematical equations to inter-relate the factors critical to the process being studied. These mathematical equations have been developed through studies of factor inter-relationships. Models are used to predict events expected in the future, or that have occurred in the past, when direct measurements are not feasible. Models can be used to assist in designing studies to obtain direct measurements of the processes of concern.
Mutagen / Mutagenic	Something that causes a change in the genetic material, or DNA, is considered to be mutagenic, and is called a mutagen. The resulting change will then be inheritable at the cellular level.
No Observed Adverse Effect Level (NOAEL)	The highest dose in an experiment which did not cause an adverse effect.
Oral	By mouth. Oral exposure refers to exposure by swallowing a material. Also see Ingestion.
Order of Magnitude	The expression “an order of magnitude” refers to a value that is roughly ten times greater than the value against which it is being compared.
Parts Per Billion (ppb)	Units of concentration (*i.e.*, µg/kg, ng/g, *etc*.)
Parts Per Million (ppm)	Units of concentration (*i.e.*, µg/g, mg/kg, *etc*.)

Physiologically-Based Pharmacokinetic Model (PBPK)	A theoretical model that describes the fate of a chemical in the body using mathematical equations. This model describes how the chemical gets into the body, where it goes in the body, how it is changed by the body, and how it leaves the body.
Pica	A craving to eat non-food items, such as dirt, paint chips, and clay. Some children exhibit pica-related behaviour.
PM_{10}	Particulate matter which is less than 10 µm in diameter. This size of particulate is small enough so as to be easily inhaled into the lungs. This is the primary particulate size fraction evaluated for potential health impacts by the HHRA.
$PM_{2.5}$	Particulate matter which is less than 2.5 µm in diameter. This size of particulate is small enough so as to be easily inhaled deep into the lower lungs (*i.e.*, alveolar), and potentially absorbed directly into the blood stream.
Point Estimate	A single estimate of the value of a parameter, used in a deterministic risk assessment. See also Deterministic.
Probabilistic / Probabilistic Risk Assessment (PRA)	A risk assessment approach incorporating the probability distributions of input parameters to estimate exposures. This approach accounts for inherent variability and uncertainty in each parameter used to estimate exposure. The outcome are probability distributions of estimated exposure and risk which can then be directly compared to a toxicity benchmark to estimate the probability of exceedance. Note that toxicity values are almost always evaluated as deterministic variables (they are not characterized by probability density functions). See also Deterministic / Deterministic risk assessment and Probability density function.
Receptor	An individual (person, plant, animal) that could come into contact with hazardous substances.
Reference Concentration (RfC)	An estimated air concentration of a specific chemical or substance which is likely to be without risk of deleterious effects to people, animals or plants, even if the exposure continues over a lifetime. Typically expressed in mg/m^3 or $\mu g/m^3$.
Reference Dose (RfD)	An estimate of a rate of exposure of people, animals or plants that is likely to be without risk of deleterious effects, even if the exposure continues over a lifetime. Reference doses are adjusted for sensitive sub-groups of the population. Typically expressed in mg/kg bodyweight/day or µg/kg bodyweight/day.

Relative Absorption Factor (RAF)	When evaluating the toxicity of a particular chemical or substance, the relative absorption difference between two different routes of exposure (*i.e*., oral and dermal) can be expressed as a relative absorption factor (RAF). This factor can then be applied to exposure estimates to adjust these exposures prior to comparison with other exposure limits when route-to-route extrapolation is necessary (*e.g*., converting an oral exposure limit to a dermal basis).
Relative Bioaccessibility	The bioaccessibility analyses conducted for the current study was relative in nature in that it is intended to be used simply as a correction factor to account for the differences in the "bioaccessible fraction" of a metal observed among different environmental media (*e.g*., soil/dust *versus* food). In this way, it can be used to compare the bioaccessibility of the metals in the GSA-specific soil and dust with the bioaccessibility of the metals used within the toxicological study on which the TRV is based.
Remediation / Remedial	Correction or improvement of a problem, such as work that is done to clean up or stop the release of chemicals from a contaminated site. After investigation of a site, remedial work may include removing soil and/or drums, capping the site or collecting and treating the contaminated soils and/or fluids.
Risk	Risk, in the context of a human health risk assessment, is the likelihood of injury, disease or death that will be caused by an action or condition.
Risk Assessment (RA)	A process that estimates the likelihood or chance that people or the environment may experience adverse effects from a particular series of events or circumstances, such as exposure to chemicals, substances or agents. The four steps of a risk assessment are: • problem formulation (also known as hazard identification); • toxicity/effects assessment; • exposure assessment; and, • risk characterization. Note: Likelihood is a quantitative term related to "probability", "chance" or to "risk".
Risk Characterization	Final phase of the risk assessment, where the exposure and effects/toxicity information are combined to evaluate potential impacts, and provide a qualitative or quantitative characterization of health risk.
Risk Management	The process of deciding how to reduce or eliminate possible adverse effects on people's health and the environment by considering the risk assessment, engineering factors (*i.e*., can engineering procedures or equipment do the job, for how long and how well?) and social, economic and political concerns.
Route of Exposure	The way in which a person or other organism in the natural environment may come in contact with a chemical, substance or agent. These are typically through inhalation, ingestion, or *via* dermal absorption. For example, drinking (ingestion) and bathing (skin contact) are two different routes of exposure to chemicals that may be found in water. See "Exposure."

Synergism	A phenomenon in which two or more discrete influences or agents acting together create an effect greater than the sum of the effects each is able to create independently.
Threshold	The dose or exposure below which an adverse effect is not expected.
Tolerable Daily Intake (TDI)	Analogous to acceptable daily intake (ADI). The term "tolerable" is used for agents that are not deliberately added, such as contaminants in food.
Total Suspended Particulates (TSP)	A measure of the total number of particles of solid or liquid matter - such as soot, dust, aerosols, fumes and mist - found in a sample of ambient air. Typically assumed to be composed of suspended particulate that have aerodynamic diameters less than 40 µm.
Toxicity	A general term that can refer either to a substance's toxic potency, or the type(s) of effects that a substance can have (for example, ocular toxicity refers to effects on the eye; respiratory system toxicity refers to effects on the respiratory system).
Toxicity Assessment	Step in the risk assessment process involving the evaluation of the toxicological properties and effects of a chemical, with special emphasis on establishment of dose response characteristics.
Toxicity Reference Value (TRV)	A toxicity reference value is an estimate of the dose (in this document, usually a daily dose over a long period of time) of a substance that is associated with a specific level of risk, or that is considered to be safe. Toxicity reference values are used to evaluate whether estimated or measured exposures are likely to cause adverse health effects. Toxicity reference values are also used to develop guidelines and standards, such as drinking water quality guidelines.
Tumorigenic Concentration	Abbreviated as TC05, the tumorigenic concentration is defined by Health Canada as the concentration of a substance in air associated with a 5% increase in tumor incidence, based on animal studies.
Uncertainty Analysis	A detailed examination of the potential sources of variability and uncertainty within the data, and their influence on risk assessment results. See Uncertainty Factor.

Uncertainty Factor (UF)	One of several factors used in calculating the reference dose from experimental data. UFs are typically used to account for such uncertainties as: (1) the variation in sensitivity among humans (*i.e.*, intraspecies); (2) the uncertainty in extrapolating animal data to humans (*i.e.*, interspecies); (3) the uncertainty in extrapolating data obtained in a study that covers less than the full life of the exposed animal or human; (4) the uncertainty in using LOAEL data rather than NOAEL data (see LOAEL and NOAEL); and, (5) uncertainties associated with the adequacy of the database of experimental data.
United States Environmental Protection Agency (U.S. EPA)	The federal agency responsible for developing and enforcing regulations to implement environmental laws enacted by Congress. U.S. EPA is responsible for researching and setting national standards for a variety of environmental programs, and delegates to states and tribes the responsibility for issuing permits and for monitoring and enforcing compliance.
Variance	Variance is a measure of scatter of data around the average value of the data set. The variance is defined as the square of the standard deviation for a normally distributed data set.
Weight-of-Evidence (WOE)	An approach to interpretation of scientific information from different lines of investigation. Literally, the taking of evidence from all disciplines to make a judgment about the cause of an outcome (*e.g.*, taking animal data, human data, chemical and molecular data to state with confidence that smoking causes cancer of the lung).
World Health Organization (WHO)	The United Nations agency which works in a variety of ways and with a variety of agencies internationally to attain the highest level of physical, mental, and social well-being for all people.