GLOSSARY OF TERMS AND ACRONYMS

This glossary is provided to define and clarify the terms used in this report. The definitions in this glossary are based on those provided by the Canadian Council of Ministers of the Environment (CCME), the Ontario Ministry of the Environment, the United States Environmental Protection Agency (U.S. EPA), The Economy of Nature by R.E. Ricklefs (4th ed., published 1997 by W.H. Freeman and Company, New York), the Merriam Webster Medical Dictionary (on-line at http://search.intelihealth.com/IH/ihtIH/WSIHW000/9276/9276.html) and American Society for Testing and Materials (ASTM) Standard E943-04 on Terminology Relating to Biological Effects and Environmental Fate.

Absorption

The process whereby one material diffuses into another material. Following exposure and uptake by a receptor, metals may be absorbed into the bloodstream and transported to various body organs.

Ad libitum

Without restraint or imposed limit; for example, animals may be given food or water as often as is wanted.

Adsorption

The process whereby one material binds to or accumulates on the surface of another material. Metals can be adsorbed to the surfaces of particulates, and may be less bioavailable in this bound state.

AE

See Assimilative Efficiency.

ALAD

Delta-aminolevulinic acid dehydratase; ALAD is an enzyme which catalyzes the formation of haemoglobin. Lead inhibits ALAD.

Anthropogenic

Caused by human activity.

Aqueous

Containing or dissolved in water or part of water

Assessment Endpoint

An explicit expression of the environmental value that is to be protected, operationally defined by an ecological entity and its attribute; the species, population or community, and a characteristic of that species, population or community that is to be evaluated and protected through the use of ecological risk assessment.

Assimilative Efficiency (AE)

The amount of energy an organism can absorb and use from a particular type of food; governed by the physiology of the organism and the characteristics of the food (see also *Gross Energy* [GE] and *Free Metabolic Rate* [FMR].

BAF

See Bioaccumulation Factor.

BCF

See Bioconcentration Factor.

Benthic

Refers collectively to any flora or fauna occurring at the bottom of a stream, lake or sea.

Benthivore

Consumer of bottom-dwelling organisms in ponds, rivers, or lakes.

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). In the case of dermal exposures, it is the fraction solubilized on the outside of the skin (*i.e.*, in sweat).

Bioaccumulation

Some chemicals are not excreted quickly if the rate of absorption (see absorption) into the body is greater than rate of excretion from the body; their concentrations can build-up in parts of the body where they are stored. This build-up of chemicals is called bioaccumulation.

Bioaccumulation Factor (BAF)

The quotient obtained by dividing the concentration of a substance in an organism (or specified tissue) by its concentration in a specified exposure medium (*e.g.*, water, food, soil) when several media are possible sources.

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 compound that is ingested, inhaled or applied to the skin that is absorbed and reaches systemic circulation. *Relative bioavailability*, as it pertains to risk assessment, has been defined as the difference in absorption of a compound 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 reference value is derived.

Bioconcentration Factor (BCF)

Measure of the net accumulation of a chemical directly from an exposure medium into an organism.

Biomagnification

Result of the process of bioaccumulation and biotransfer by which tissue concentrations of chemicals in organisms at one trophic level exceed tissue concentrations in organisms at the next lower trophic level in a food chain.

Bioassay

A controlled experiment for the quantitative establishment of the character and strength of a substance by measuring its effect on a living organism

Buffering

The ability of a system to resist a change of pH when an acid or alkali is added or the system is diluted.

BW

Body weight.

Canadian Council of Ministers of the Environment

Comprised of 14 environment ministers from the federal, provincial and territorial governments; promotes effective intergovernmental cooperation and coordinated approaches to inter-jurisdictional issues such as air pollution and toxic chemicals. Although the CCME establishes nationally-consistent environmental standards, strategies and objectives it has no authority to enforce them on individual jurisdictions

Canadian Environmental Quality Guidelines

Nationally-approved, science-based indicators of environmental quality. They are recommended numerical or narrative limits for a variety of substances and environmental quality parameters, which, if exceeded, may impair the health of Canadian ecosystems.

Canid

Member of the canine family, which includes carnivorous mammals such as wolves, jackals, foxes, coyote, and the domestic dog.

Carnivore

Consumer of other animals.

Carrying Capacity

Number of individuals in a population that the resources of a habitat can support.

CCME

See Canadian Council of Ministers of the Environment.

CEM

Centre for Environmental Monitoring at Laurentian University, Sudbury, Ontario.

Centre for Environmental Monitoring (CEM)

The Centre for Environmental Monitoring, founded in 2000 at Laurentian University in Sudbury, Ontario, is engaged in interdisciplinary research that uses the superb natural laboratories of the region to study the effects of both emissions and of abatement technologies on both affected and near-pristine land systems, as well as on human health issues through studies of water quality.

CEQC

See Canadian Environmental Quality Guidelines

CFIP

Community Fisheries Involvement Program.

Chemical of Concern (COC)

A metal or metalloid selected in Sudbury soil, water or sediment that meets the selection criteria to be carried forward for detailed risk assessment.

Committee on the Status of Endangered Wildlife in Canada

A committee of experts that assesses and designates which wild species are in some danger of disappearing from Canada.

Community of Interest

A group of people or geographical community identified at the beginning of the risk assessment process that are potentially exposed to the chemicals of concern, and who are therefore, subjects in the human health risk assessment process.

Concentration

The proportion of one substance dissolved or contained in a given amount of another. The concentration unit has two components: the numerator (quantity dissolved) and the denominator (quantity of the material into which the substance is dissolved). For example, an arsenic soil concentration of 10 mg/kg (*i.e.*, 10 ppm) represents 10 mg of arsenic present within one kilogram of soil.

Conceptual Model

A written description and a visual representation of the relationships between valued ecosystem components and the chemicals to which they may be exposed.

Condition Factor (Kn)

A quantitative measurement used to compare girth and energy storage of a fish, expressed in the following equation: $Kn = W/L^b$. Where W is Weight and L is fork length.

Control

A treatment in a toxicity test that duplicates all the conditions of the exposure treatments but contains no test material. The control is used to determine the response rate expected in the test organisms in the absence of the test material.

Coppice

Multiple stems growing up from the base of a felled tree.

COSEWIC

Committee on the Status of Endangered Wildlife in Canada.

Decomposers

Any of various organisms (such as bacteria and fungi) that return organic substances and nutrients to the environment (*e.g.*, soil) by feeding on and breaking down dead matter.

Depuration

Loss of a substance from an organism (*e.g.*, soil from the gut of an earthworm).

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, food ingestion rate) is assigned a single value. See also *Probabilistic / Probabilistic risk assessment.*

Direct Effects

Impacts caused by the toxic action of the chemical of concern on a valued ecosystem component.

Dissolved Organic Carbon (DOC)

All organic carbon (*e.g.*, compounds such as acids and sugars, leached from soils or roots) that are dissolved in water at specific temperature and pressure.

DOC

See Dissolved Organic Carbon

Dose

The amount of substance to which an avian or mammalian VEC is exposed, expressed on a body weight basis.

EC

See Environment Canada.

Ecological Risk Assessment (ERA)

A risk assessment focused on estimating potential risks to a defined set of environmental biota (plants and animals) from exposure to a particular agent of agents. The ERA process includes four basic steps: receptor characterization, exposure assessment, hazard assessment and risk characterization. These steps combine to produce a formal analysis and estimation of the likelihood that valued ecosystem components will experience adverse effects from a particular series of events, such as exposure to chemicals.

EDI

See Estimated Daily Intake.

Effect Concentration (ECx)

Concentration or dose of a particular chemical resulting in an effect (usually inhibitory) on x% of test organisms, relative to unexposed controls.

Effects Assessment

Phase of the ecological risk assessment that describes the relationship between concentrations of chemicals of concern and ecological responses.

EEM

See Environmental Effects Monitoring

Endangered Species

A wildlife species facing imminent extirpation or extinction.

Environmental Effects Monitoring (EEM)

Is the process of characterizing the degree of environmental degradation associated with industry and development. EEM is governed at a federal and provincial level.

Environment Canada (EC)

A Ministry within the Government of Canada. Environment Canada's mandate is to preserve and enhance the quality of the natural environment, including water, air and soil quality; conserve Canada's renewable resources, including migratory birds and other non-domestic flora and fauna; conserve and protect Canada's water resources; carry out meteorology; enforce the rules made by the Canada - United States International Joint Commission relating to boundary waters; and coordinate environmental policies and programs for the federal government.

EPC

See Exposure Point Concentration.

Ephemeral

Present or living only for a short duration

Epilimnion

The freely circulating surface water of a standing water (*e.g.*, lake) ecosystem.

ER

See Exposure Ratio.

ERA

See Ecological Risk Assessment.

Estimated Daily Intake (EDI)

A mathematical estimation of the rate of oral exposure to a particular chemical of concern for a particular VEC. Units are generally mg/kg bw/day.

Exposure

The contact or co-occurrence of a chemical of concern with a VEC.

Exposure Assessment

In the context of ecological risk assessment, the phase that estimates the amount of a chemical that enters or comes into contact with the VEC. An exposure assessment also takes into consideration the length of time and the nature of a population exposed to a chemical.

Exposure Point Concentration (EPC)

The concentration of a chemical in its transport medium (*i.e.*, air, food, water, *etc*.) at the point of contact where exposure occurs.

Exposure Ratio (ER)

Ratio of a COC exposure level to a TRV. Analogous to the commonly-used term "Hazard Quotient". An ER $\leq$ 1 indicates an acceptable level of risk while an ER > 1 indicates the potential for unacceptable risk, and the need for further evaluation.

Extinct Species

A wildlife species that no longer exists.

Extirpated Species

A species no longer existing in a region, but occurring elsewhere.

FIR

See Food Intake Rate.

Food Intake Rate (FIR)

Rate at which an organism consumes food; usually expressed in terms of unit of mass per unit of time (*i.e.*, kg/day).

Forbs

Herbaceous, broad-leaved vegetation (*i.e.*, other than grasses) consumed by grazers.

FMR

See Free Metabolic Rate.

Free Metabolic Rate (FMR)

Metabolic cost of basic functions, including basal metabolism, thermoregulation, locomotion, feeding, predator avoidance, alertness, posture, digestion and food detoxification, reproduction and growth.

Gross Energy (GE)

The total amount of energy in a food item; a function of the characteristics of the food (see also *Assimilative Efficiency* [AE] and *Metabolizable Energy* [ME]).

Guidelines

In this document, it generally refers to environmental quality criteria, objectives and benchmarks.

Guild

A group of species occupying similar ecological positions within the same habitat.

Habitat

Place where a plant or animal lives, often characterized by a dominant plant form and specific physical characteristics (*e.g.*, soil type, amount of plant cover, *etc.*).

Herbivore

Consumer of living plants or their parts.

Hepatic

Of or relating to the liver.

HHRA

See Human Health Risk Assessment.

Homeostasis

The maintenance of constant internal conditions in the face of a varying external environment.

Home Range

The area to which an animal confines its activities.

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.

Indirect Effects

Impacts on a VEC caused by changes in their habitat (including food quality or quantity).

Inhibition Concentration (ICx)

Concentration or dose of a particular agent (*e.g.*, chemical of concern) resulting in an x% effect (usually inhibitory) on test organisms, relative to unexposed controls.

Insectivore

An organism that consumes insects.

Interim Sediment Quality Guidelines (ISQG)

Interim guidelines issued by Environment Canada for the protection of aquatic organisms that live in or on the sediment that forms on the bottom of lakes and rivers.

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.

ISQG

See Interim Sediment Quality Guidelines.

LEL

See Lowest Effect Level.

LOAEL

See Lowest-Observed-Adverse-Effect Level.

Lowest Effect Level (LEL)

In Ontario, the LEL indicates a level of sediment contamination that can be tolerated by the majority of benthic organisms.

Lowest-Observed-Adverse-Effect Level (LOAEL)

Lowest level of an agent (*e.g.*, chemical) evaluated in a toxicity test or biological field survey that has a statistically-significant adverse effect on the exposed organisms compared with unexposed organisms in a control or reference site.

Macrophyte

Large, macroscopic aquatic plants (*i.e.*, sedges, weeds, bulrushes, lily pads).

MDL

See Minimum Detection Limit.

Measure

Parameter used to evaluate the assessment endpoint. Includes Measures of Exposure, Measures of Effect and Measures of Ecosystem and VEC Characteristics.

Measure of Exposure

A measure of chemical presence and movement in the environment and its contact with the VEC.

Measure of Effect

A measure that describes a change in a characteristic of a VEC.

Measure of Ecosystem and VEC Characteristics

A measure that influences the behaviour and location of a VEC, the distribution of a chemical, and life-history characteristics of the VEC that may affect exposure or response to the chemical.

Medium

The environmental substance (*e.g.*, air, water, soil) containing chemicals of concern. Fish, plant and animal tissues may also be media. The plural of "medium" is "media

ME

See Metabolizable Energy.

Metabolizable Energy (ME)

The energy available to fulfill metabolic needs (or the energy remaining after losses to feces and urine); calculated as ME = GE x AE.

Metalimnion

A zone of abrupt temperature change (thermocline) between the warm epilimnion and the cool hypolimnion (the cold lower layer of a stratified lake).

Minimum Detection Limit (MDL)

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.

MNR

See Ontario Ministry of Natural Resources.

MOE/MOEE

See Ontario Ministry of the Environment (and Energy).

Mobilization

The tendency for a chemical to move from one place to another.

Morphometry

Refers to the physical characteristics of a lake such as size and shape of a lake basin, mean depth, maximum depth, volume, drainage area, and flushing rate.

NEL

See *No Effect Level.*

NFMR

See Normalized Free Metabolic Rate.

Natural Heritage Information Centre

The Natural Heritage Information Centre compiles, maintains and provides information on rare, threatened and endangered species and spaces in Ontario. This information is stored in a central repository containing a computerized database, map files and an information library. The NHIC website makes this information available through the internet.

NHIC

See Natural Heritage Information Centre.

NOAEL

See No-Observed-Adverse-Effect Level.

No Effect Level

In Ontario, refers to the level of sediment contamination at which no toxic effects have been observed on aquatic organisms.

Non-detect

Refers to concentrations of a particular chemical that are below the minimum detection limit.

No-Observed-Adverse-Effect Level (NOAEL)

Highest level of an agent (*e.g*., chemical) evaluated in a toxicity test or biological field survey that causes no statistically-significant difference in effect compared with the controls or a reference site.

Normalized Free Metabolic Rate (NFMR)

Free metabolic rate adjusted for the body weight of the organism of interest (*i.e*., NFMR = FMR/BW).

Objective

Detailed task related to the goal of the study.

OMAF

See Ontario Ministry of Agriculture and Food.

Omnivore

Organism whose diet is broad, including both plant and animal foods; specifically, an organism that feeds on more than one trophic level.

OMNR

See Ontario Ministry of Natural Resources.

Ontario Ministry of Agriculture and Food

Provincial government body responsible for Ontario's agri-food sector.

Ontario Ministry of Natural Resources (MNR/OMNR)

Provincial government body responsible for protecting and managing Ontario's natural resources.

Ontario Ministry of the Environment (and Energy) (MOE/MOEE)

Provincial body responsible for development, implementation, and enforcement of regulations, as well as various programs and initiatives, which address environmental issues having local, regional and/or global effects. Formerly known as the Ministry of Environment and Energy, but currently known as the Ministry of the Environment. The MOE is a member of the Sudbury Soils Study Technical Committee

Paresis

Impaired mental function.

Paleolimnology

The study of the physical properties of freshwater lakes in prehistoric times, in this case Upper Arrow Lake geochemistry (nitrogen, carbon and phosphorus) conditions, algae evolution and fossil zooplankton.

Pelagic

Of the open water zone of a lake or sea.

PEL

See Probable Effect Level.

Photosynthetic

The characteristic of a green plant to convert organic compounds and carbon dioxide into energy in the presence of sunlight.

Pelage

Hair, wool, or fur covering the body of a mammal.

Phytotoxicity Test

An evaluation of plant responses (*e.g.*, decreased growth) to chemicals in soil, often conducted in the laboratory using soil collected from the field.

Piscivore

Organism that consumes fish.

Plant available

The portion of nutrient substances in the soil that can be taken up from the environment by plants at rates and amounts required for growth.

Population

An aggregate of individuals of a species within a specified location in space and time.

Primary Consumers

Herbivores, the lowest consumer in the food web.

Primary Producers

Green plants, algae, or other organisms that assimilate the energy of light to synthesize organic compounds (photosynthesis).

Probable Effect Level (PEL)

According to CCME, a sediment concentration of a chemical above which adverse biological effects on benthic organisms frequently occur. Calculated as the geometric mean of the 50^{th} percentile of the effect data set and the 85^{th} percentile of the no effect data set.

Probabilistic / Probabilistic risk assessment

Calculation and expression of risks using distributions of input parameters in order to account for inherent variability and uncertainty in each parameter. Probabilistic risk results approximate a full range of possible outcomes and the likelihood of each, which often is presented as a frequency distribution graph, thus allowing uncertainty or variability to be expressed quantitatively. See also *Deterministic / Deterministic risk assessment.*

Problem Formulation

Initial stage of the risk assessment where information is gathered and interpreted to plan and focus the risk assessment.

PSQG

Provincial Sediment Quality Guidelines.

RAF

See Relative Absorption Factor.

RAIS

See Risk Assessment Information System.

Reference Site

A site used for comparison to a contaminated site, which has not been influenced by contamination from the site under investigation.

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 adsorption factor. It is a unitless variable used in wildlife modelling to incorporate bioaccessibility information and is calculated by dividing percent absorption of the chemical from soil by the percent absorption of the chemical from the TRV-study medium.

Request for Proposals (RFP)

The official document produced by a group or organization that requests vendor bids for a specific project or projects and also lists project specifications and application procedures. As part of the Sudbury Soils Study, the Technical Committee produced an RFP outlining the study requirements, to which the SARA Group (among others) responded in a competitive bid process.

Relict species

A species that at an earlier time was abundant but now occurs in only one or a few small areas.

RFP

See Request for Proposals.

Risk

The expected frequency or probability of undesirable effects resulting from exposure to known or expected stressors.

Risk Assessment

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.

Risk Assessment Goal

The purpose for conducting the risk assessment study.

Risk Assessment Information System (RAIS)

A centralized collection of risk assessment tools that provides various applications used in risk calculations.

Risk-based Decision-making

Process through which decisions are made about contaminated sites according to the risk each site poses to human health and the environment. Identifies necessary and appropriate action at any phase of the corrective action process. Depending on known or anticipated risks to human health and the environment, appropriate action can include site closure, monitoring and data collection, active or passive remediation, containment, or imposition of institutional controls.

Risk Characterization

Final phase of the risk assessment, where the exposure and effects information are combined to evaluate potential impacts.

SARA Group

See Sudbury Area Risk Assessment Group.

Scaling coefficients

A descriptor of the growth pattern of a fish. Used in the calculation of the *Condition Factor.*

Seston

Particulate organic matter such as plankton, organic detritus and inorganic particles such as silt.

SD

Standard deviation.

Secondary Consumers

Organisms that feed on primary consumers.

Sediment

Particulate material that usually lies below water.

SEL

Severe effect level.

Severe Effect Level

In Ontario, the level of sediment contamination at which pronounced disturbance of the sediment-dwelling community can be expected.

SIR

See Soil/Sediment Intake Rate.

Smelter Emissions

Particulate and non-particulate emissions (*i.e.*, gaseous) related to Inco and Falconbridge smelter operations in the City of Greater Sudbury.

Soil/Sediment Intake Rate (SIR)

Rate at which an organism consumes soil and/or sediment; usually expressed in terms of unit of mass per unit of time (*e.g.*, kg/day)

Species

A group of organisms that actually or potentially interbreed and are reproductively isolated from all other such groups; a taxonomic grouping of morphologically similar individuals; the category below genus.

Study Area

The particular area being examined in a risk assessment.

Sudbury Area Risk Assessment (SARA) Group

A consortium of companies hired to complete the human health and ecological risk assessment for the City of Greater Sudbury and surrounding area. The companies include: Intrinsik Environmental Sciences Inc. (formerly Cantox Environmental Inc.), C. Wren & Associates (now part of AECOM Canada), Rowan Williams Davies & Irwin Inc., SGS Lakefield, Trevor Smith Diggins, Ms. Jan Lindquist, and Goss Gilroy Inc.

Sudbury Soils Study

In recent years, several studies have shown there are areas in Sudbury with elevated metal levels in the soil. These areas are generally close to the historic smelting sites of Coniston, Falconbridge and Copper Cliff. Although these metals do occur naturally in all soils, the studies indicate that the higher amounts in surface soil (the top 5 cm. of soil) are the result of local mining, smelting and refining operations.

In 2001, the Ontario Ministry of the Environment (MOE) released a report that identified that the concentrations of nickel, cobalt, copper and arsenic exceeded the generic MOE soil quality guidelines. Under Ontario legislation, this triggers the need for more detailed study. Therefore, the MOE made two recommendations:

- That a more detailed soil study be undertaken to fill data gaps; and,
- That a human health and ecological risk assessment be undertaken.

Both Vale Inco and Xstrata Nickel (formerly Falconbridge Limited) voluntarily accepted the recommendations and began working together with other key stakeholders to establish what is commonly referred to as “The Sudbury Soils Study”. The current volume presents the ecological risk assessment conducted as part of the Sudbury Soils Study.

Surface Water

All water naturally open to the atmosphere, such as rivers, lakes, reservoirs, streams, and seas.

Symbiont

One of two or more species having an intimate and often obligatory association.

Technical Committee (TC)

Six organizations, identified as major stakeholders in maintaining of a healthy environment in Sudbury, have been given the responsibility to oversee the Sudbury Soils Study. They are the Sudbury District

Health Unit (SDHU), Ministry of the Environment (MOE), City of Greater Sudbury, Vale Inco, Xstrata Nickel (formerly Falconbridge Limited) and Health Canada.

The role of the Technical Committee was to provide overall management of the process: provide scientific direction and review of the study, and select and manage a qualified consultant to develop comprehensive risk assessments to protect human health and ecological health.

Temporal Analysis

An assessment of change over time (*e.g.*, changes in plant communities, as seen from aerial photographs or satellite images).

Tertiary Consumer

An organism that feeds on secondary consumers.

Threatened Species

A wildlife species likely to become endangered if limiting factors are not reversed.

Thermal stratification

The formation of different temperature layers in a lake system.

Toxicity

Degree to which a chemical substance (or physical agent) elicits a deleterious or adverse effect upon the biological system of an organism exposed to the substance over a designated time period.

Toxicity Reference Value (TRV)

An acceptable level of exposure.

Trophic Level

A group of organisms that occupy the same position in a food chain.

TRV

See Toxicity Reference Value.

95% UCLM

See 95 % Upper Confidence Limit on the Mean.

Uncertainty

Imperfect knowledge concerning the present or future state of the system under consideration; a component of risk resulting from imperfect knowledge of the degree of hazard or of its spatial and temporal distribution.

United States Environmental Protection Agency (U.S. EPA)

Federal agency in the United States 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.

95 % Upper Confidence Limit on the Mean (95% UCLM)

The upper bound 95th percentile 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.

U.S. EPA

See United States Environmental Protection Agency.

Valued Ecosystem Component (VEC)

An ecological species, population or community that is important to people, has economic and/or social value, is ecologically significant and is evaluated in the risk assessment.

Variability

Describes the inherent natural heterogeneity in exposure model parameters (*i.e.*, wildlife body weights, COC concentrations across the study area).

VEC

See Valued Ecosystem Component.

VETAC

Vegetation Enhancement Technical Advisory Committee.

Vermifore

Consumer of earthworms.

VTE

Referring to a species that is considered vulnerable, threatened, or endangered.

Vulnerable

A species particularly at risk because of low or declining numbers, small range or for some other reason, but not a threatened species.

Water Intake Rate (WIR)

Rate at which an organism consumes water; usually expressed in terms of unit of volume per unit of time (*i.e.*, L/day).

Weight –of- Evidence (WOE)

A type of analysis that considers all available data and is used to reach a conclusion based on the amount and quality of data supporting each alternative conclusion.

Wildlife Management Unit (WMU)

One of many small areas within Ontario, managed by the Ontario Ministry of Natural Resources, which is subject to specific hunting and fishing restrictions or requirements.