Appendix E. Glossary

A

Anthropogenic ambient soil background — Amount of a substance, or family of closely related substances (for example, similar element species or similar compounds), present in soil due to anthropogenic nonpoint sources or due to their ability to be transported long distances. This is potentially most relevant to some recalcitrant organics, such as polycyclic aromatic hydrocarbons (PAHs) and 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) that can be present in soil at low concentrations not because of local anthropogenic sources, but because of their persistence, their ubiquity, or their ability to be transported long distances. Additionally, this could be relevant to metals with a widespread urban source, such as the historical association of lead with vehicle emissions or long-distance transport of mercury.

B

Background breakpoint (BP) — A point in the pooled dataset determined by using iterative normal Q-Q plots in untransformed raw scale. A background BP distinguishes uncontaminated and contaminated site locations.

Background reference area — The area identified as appropriate for collection of samples used to ultimately determine a soil background concentration or range.

Background threshold value (BTV) — A background population parameter representing some upper threshold, such as a 95^{th} percentile or a 99^{th} percentile of the distribution of the background population. Though this background parameter is not specifically defined in USEPA documents, USEPA guidance documents ((USEPA 2002), (USEPA 2002), (USEPA 2006)) describe several methods to estimate this background parameter. For example, in computing a 95-95 UTL based upon a background dataset, you are estimating the 95th percentile of the background population. Some details about BTVs are described in Appendix A.

BTV estimate — Statisical limits such as UPLs, UTLs, and USLs represent estimates of a BTV. BTV estimates are computed based upon a background dataset.

C

Chemicals of potential concern (COPC) — In a risk assessment, a substance detected at a hazardous waste site that has the potential to affect receptors adversely due to its concentration, distribution, and mode of toxicity (USEPA 1997). COPC are generally categorized operationally, based on how they are measured in the analytical laboratory. “Inorganic” COPC generally address metals, elements, and unique inorganic compounds such as perchlorate. “Organic” COPC include VOCs (such as acetone, benzene, and trichloroethylene), semivolatile organic compounds (such as chlorophenols, chlorobenzenes, and phthalate esters), pesticides (such as atrazine, DDT, toxaphene), PCBs, and polychlorinated dibenzodioxin and dibenzofurans.

Conceptual site model (CSM) — Iterative representation of the site that summarizes and helps project planners visualize and understand available information. The CSM is the primary planning and decision-making tool used to identify the key issues and the data necessary to transition a project from characterization through post-remedy.

D

Default soil background — Established by regulatory agencies for a larger area (for example, a state, a region, or a unique geological area) that generally shares similar physical, chemical, geological, and biological characteristics. Since default soil background is intended to be used to evaluate a large number of sites, it is generally established to be on the conservative side. Default soil background can be established for both natural and anthropogenic ambient soil background concentrations.

E

Environmental forensics — A well-established discipline that considers scientific and nonscientific information to interpret the potential sources and ages of certain chemical compounds detected at a site, typically at anomalous concentrations.

Established background dataset — In this report, a dataset (traditional existing or extracted), agreed upon by all parties to be used as a background dataset.

Existing/traditional background dataset — A dataset containing COPC concentrations of samples collected from uncontaminated off-site locations collected using USEPA policy guidelines described in USEPA documents (e.g., (USEPA 1989), (USEPA 1992), (USEPA 1992), (USEPA 2002), (USEPA 2002)).

Extracted background dataset/sitewide anthropogenic extracted background dataset — Dataset consisting of all observations (detects and NDs) less than or equal to the background BP of the pooled dataset. Note that this definition is specific to this document; background datasets derived per agency guidelines are not required to have background BPs or

be strictly nonoverlapping with contaminated data.

F

G

Graphical display — A graphical representation of data displaying data points with their group identification as well as statistics (for example, UTL, USL) of interest.

H

I

Index plot — An index plot displaying data points with group identification as well as horizontal lines displayed at BTV estimates of interest, such as UPL, UTL, or USL.

J

K

L

Limit of detection (LOD) — The measure of an analytical method to detect the presence of an analyte with a 99% level of confidence.

M

Method detection limit (MDL) — The minimum measured concentration that can be reported with 99% confidence that the measured concentration is distinguishable from method blank results (USEPA 2015).

N

Natural soil background — The concentration of a substance, or family of closely related substances (for example, similar element species or similar compounds) present in soil due to geological characteristics, natural processes, or releases from nonanthropogenic sources (for example, wildfires, volcanic activity). Natural soil background does not include releases from local anthropogenic sources, releases from distant anthropogenic sources of persistent chemicals (due to their ability to be transported long distances), or other anthropogenic sources of ubiquitous or widespread contamination. Natural soil background is potentially one of the broadest applicable definitions, in that natural background for certain chemicals has been established statewide or over a large geographic area provided the geological formations are conserved.

Normal Q-Q plot/probability plot — A graphical method for comparing an empirical dataset (*y*-axis) to a theoretical normal distribution (*x*-axis). Each point is the cartesian coordinates of the theoretical quantile and the ordered (in ascending order) empirical data. A normal probability plot (Chambers et al. 1983) is generated similarly. The two plots—normal Q-Q plot and probability plot—are used to address the same objectives (for example, (Chambers et al. 1983), (Reimann, Filzmoser, and Garrett 2005)). These graphs are often used as exploratory tools to determine: data skewness, data variability, data distribution tails, outliers, and the presence of more than one population in the dataset.

O

Oxyanion — An ion that is negatively charged and contains oxygen.

P

Petrogenic — Chemicals derived directly from fossil fuels (crude oil, refined petroleum, or coal). Most common use is in reference to petrogenic PAHs derived from natural heating of fossil fuels in the earth over geologic time.

Pooled/mixture/broader dataset — A pooled dataset consists of observations collected from on-site AOCs and operating units. The pooled dataset may also consist of observations of a traditional background dataset (when available).

Pyrogenic — Chemicals produced during the processes of heating, such as combustion and carbonization. Most common use is in reference to pyrogenic PAHs derived from the anthropogenic thermal decomposition of organic matter (oil, coal, or biomass).

Q-Q plot — A quantile-quantile (Q-Q) plot displaying goodness of fit test statistics and other descriptive statistics, including the correlation coefficient, mean, and standard deviation.

R

S

Site-specific background population — A population consisting of areas/locations 1) not impacted by site-related activities and releases; 2) influenced by non-site-related anthropogenic releases (if any) comparable to those of the site; and 3) with natural variability and geological properties comparable to the site.

Site-specific soil background — The concentration of a substance established for a specific site to compare to that one site's data to estimate if site concentrations may reflect background. This requires collection of data representative of the site's natural and/or anthropogenic ambient background that has similar physical, chemical, geological, biological, and ecological characteristics and land use as the site being evaluated. Depending on the project goal, it may also be necessary to include other anthropogenic sources, such as municipal or industrial outfalls and urban runoff, that are influencing chemical concentrations at the site being evaluated.

Skewness — A measure of the lack of radial symmetry in a distribution about the mean.

Soil — For purposes of this document, the unconsolidated material present at ground surface and extending down to solid rock.

Soil background — Includes both natural soil background and anthropogenic ambient soil background. At some locations, the unconsolidated material may have formed in place from the underlying bedrock or associated with material that was transported to the location.

T

U

V

W

X

Y

Z