Air Pollution Control Division

Technical Services Program

APPENDIX P2

Glossary, Acronyms & Abbreviations

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GLOSSARY OF QUALITY ASSURANCE AND RELATED TERMS

Acceptance criteria — Specified limits placed on characteristics of an item, process, or service defined in requirements documents. (ASQC Definitions)

Accuracy — A measure of the closeness of an individual measurement or the average of a number of measurements to the true value. Accuracy includes a combination of random error (precision) and systematic error (bias) components that are due to sampling and analytical operations; the EPA recommends using the terms "precision" and "bias", rather than "accuracy," to convey the information usually associated with accuracy.

Activity — An all-inclusive term describing a specific set of operations of related tasks to be performed, either serially or in parallel (e.g., research and development, field sampling, analytical operations, equipment fabrication), that, in total, result in a product or service.

Approved: The documented determination that the proposed quality document is suitable for the intended purpose and meets the requirements is specified in the applicable Quality Standard.

Assessment — The evaluation process used to measure the performance or effectiveness of a system and its elements. As used here, assessment is an all-inclusive term used to denote any of the following: audit, performance evaluation (PE), management systems review (MSR), peer review, inspection, or surveillance.

Audit (quality) — A systematic and independent examination to determine whether quality activities and related results comply with planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve objectives.

Audit of Data Quality (ADQ) — A qualitative and quantitative evaluation of the documentation and procedures associated with environmental measurements to verify that the resulting data are of acceptable quality.

Auditee – The organization being audited.

Auditor – A person qualified to perform audits.

Authenticate — The act of establishing an item as genuine, valid, or authoritative.

Bias — The systematic or persistent distortion of a measurement process, which causes errors in one
direction (i.e., the expected sample measurement is different from the sample's true value). Refer to Appendix D, Data Quality Indicators, for a more detailed definition.

Blank — A sample subjected to the usual analytical or measurement process to establish a zero baseline or background value. Sometimes used to adjust or correct routine analytical results. A sample that is intended to contain none of the analytes of interest. A blank is used to detect contamination during sample handling preparation and/or analysis.

Calibration — A comparison of a measurement standard, instrument, or item with a standard or instrument of higher accuracy to detect and quantify inaccuracies and to report or eliminate those inaccuracies by adjustments.

Calibration drift — The deviation in instrument response from a reference value over a period of time before recalibration.

Calibration Specialist – The person responsible for performing calibrations.

Certification — The process of testing and evaluation against specifications designed to document, verify, and recognize the competence of a person, organization, or other entity to perform a function or service, usually for a specified time.

Chain of custody — An unbroken trail of accountability that ensures the physical security of samples, data, and records.

Characteristic — Any property or attribute of a datum, item, process, or service that is distinct, describable, and/or measurable.

Check standard — A standard prepared independently of the calibration standards and analyzed exactly like the samples. Check standard results are used to estimate analytical precision and to indicate the presence of bias due to the calibration of the analytical system.

Client – Any individual or organization for whom items or services are furnished or work performed in response to defined requirements and expectations. See also Participant and User.

Collocated samples — Two or more portions collected at the same point in time and space so as to be considered identical. These samples are also known as field replicates and should be identified as such.

Comparability — A measure of the confidence with which one data set or method can be compared to another.

Completeness — A measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under correct, normal conditions. Refer to Appendix D, Data Quality Indicators, for a more detailed definition.

Computer program — A sequence of instructions suitable for processing by a computer. Processing may include the use of an assembler, a compiler, an interpreter, or a translator to prepare the program for execution. A computer program may be stored on magnetic media and referred to as "software," or it may be stored permanently on computer chips, referred to as "firmware." Computer programs covered in a QAPP are those used for design analysis, data acquisition, data reduction, data storage (databases), operation or control, and database or document control registers when used as the controlled source of quality information.

Conceptual Model: This describes the scientific and engineering process under investigation. It is used as a tool for organizing information about the current state of

knowledge and understanding of the project, as well as for documenting key theoretical and practical assumptions underlying the data and information collection.

Confidence Interval — The numerical interval constructed around a point estimate of a population parameter, combined with a probability statement (the confidence coefficient) linking it to the population's true parameter value. If the same confidence interval construction technique and assumptions are used to calculate future intervals, they will include the unknown population parameter with the same specified probability.

Confidentiality procedure — A procedure used to protect confidential business information (including proprietary data and personnel records) from unauthorized access.

Configuration — The functional, physical, and procedural characteristics of an item, experiment, or document.

Conformance — An affirmative indication or judgment that a product or service has met the requirements of the relevant specification, contract, or regulation; also, the state of meeting the requirements.

Consensus standard — A standard established by a group representing a cross section of a particular industry or trade, or a part thereof.

Contractor — Any organization or individual contracting to furnish services or items or to perform work.

Corrective action — Any measures taken to rectify conditions adverse to quality and, where possible, to preclude their recurrence.

Correlation coefficient — A number between -1 and 1 that indicates the degree of linearity between two variables or sets of numbers. The closer to -1 or +1, the stronger the linear relationship between the two (i.e., the better the correlation). Values close to zero suggest no correlation between the two variables. The most common correlation coefficient is the product-moment, a measure of the degree of linear relationship between two variables.

Data of known quality — Data that have the qualitative and quantitative components associated with their derivation documented appropriately for their intended use, and when such documentation is verifiable and defensible.

Data Quality Assessment (DQA) — The scientific and statistical evaluation of data to determine if data obtained from environmental operations are of the right type, quality, and quantity to support their intended use. The five steps of the DQA Process include: 1) reviewing the DQOs and sampling design, 2) conducting a preliminary data review, 3) selecting the statistical test, 4) verifying the assumptions of the statistical test, and 5) drawing conclusions from the data.

Data Quality Indicators (DQIs) — The quantitative statistics and qualitative descriptors that are used to interpret the degree of acceptability or utility of data to the user. The principal data quality indicators are bias, precision, accuracy (bias is preferred), comparability, completeness, representativeness.

Data Quality Objectives (DQOs) — The qualitative and quantitative statements derived from the DQO Process that clarify study's technical and quality objectives, define the appropriate type of data, and specify tolerable levels of potential decision errors that will be used as the basis for establishing the quality and quantity of data needed to support decisions.

Data Quality Objectives (DQO) Process — A systematic strategic planning tool based on the scientific method that identifies and defines the type, quality, and quantity of data needed to satisfy a specified use. The key elements of the DQO process include:

concisely defining the problem,
identifying the decision to be made,
identifying the key inputs to the decision,
defining the boundaries of the study,
developing a decision rule,
specifying tolerable limits on potential decision errors, and
selecting the most resource efficient data collection design.

DQOs are the qualitative and quantitative outputs from the DQO Process.

Data Standard: A documented consensus-based agreement on the format and definition of data.

Data reduction — The process of transforming the number of data items by arithmetic or statistical
calculations, standard curves, and concentration factors, and collating them into a more useful form.
Data reduction is irreversible and generally results in a reduced data set and an associated loss of detail.

Data usability — The process of ensuring or determining whether the quality of the data produced meets the intended use of the data.

Deficiency — An unauthorized deviation from acceptable procedures or practices, or a defect in an item.

Demonstrated capability — The capability to meet a procurement's technical and quality specifications through evidence presented by the supplier to substantiate its claims and in a manner defined by the customer.

Design — The specifications, drawings, design criteria, and performance requirements. Also, the result of deliberate planning, analysis, mathematical manipulations, and design processes.

Design change — Any revision or alteration of the technical requirements defined by approved and issued design output documents and approved and issued changes thereto.

Design review — A documented evaluation by a team, including personnel such as the responsible designers, the client for whom the work or product is being designed, and a

quality assurance (QA) representative but excluding the original designers, to determine if a proposed design will meet the established design criteria and perform as expected when implemented.

Detection Limit (DL) — A measure of the capability of an analytical method to distinguish samples that do not contain a specific analyte from samples that contain low concentrations of the analyte; the lowest concentration or amount of the target analyte that can be determined to be different from zero by a single measurement at a stated level of probability. DLs are analyte- and matrix-specific and may be laboratory-dependent.

Distribution — 1) The appointment of an environmental contaminant at a point over time, over an area, or within a volume; 2) a probability function (density function, mass function, or distribution function) used to describe a set of observations (statistical sample) or a population from which the observations are generated.

Document — Any written or pictorial information describing, defining, specifying, reporting, or certifying activities, requirements, procedures, or results.

Document control — The policies and procedures used by an organization to ensure that its documents and their revisions are proposed, reviewed, approved for release, inventoried, distributed, archived, stored, and retrieved in accordance with the organization's requirements.

Duplicate samples — Two samples taken from and representative of the same population and carried through all steps of the sampling and analytical procedures in an identical manner. Duplicate samples are used to assess variance of the total method, including sampling and analysis. See also collocated sample.

Entity – That which can be individually described and considered, such as a process, product, item, organization, or combination thereof.

Environmental conditions — The description of a physical medium (e.g., air, water, soil, sediment) or a biological system expressed in terms of its physical, chemical, radiological, or biological characteristics.

Environmental data — Any parameters or pieces of information collected or produced from measurements, analyses, or models of environmental processes, conditions, and effects of pollutants on human health and the ecology, including results from laboratory analyses or from experimental systems representing such processes and conditions.

Environmental Data Collection: The process of acquiring or gathering environmental data through various means including, but not limited to, sampling and analysis activities, retrieval from information systems and literature sources, and receipt from EPA partners and the regulated community.

Environmental Data Operations: The work performed to collect, produce, or use environmental data.

Environmental Data Production: The process of generating environmental data through various means including, but not limited to, the use of measurement

instrumentation, information technology, computer models, and data analysis tools (e.g., statistics, risk assessment methods).

Environmental monitoring — The process of measuring or collecting environmental data.

Environmental processes — Any manufactured or natural processes that produce discharges to, or that impact, the ambient environment.

Environmental programs — An all-inclusive term pertaining to any work or activities involving the environment, including but not limited to: characterization of environmental processes and conditions; environmental monitoring; environmental research and development; the design, construction, and operation of environmental technologies; and laboratory operations on environmental samples.

Environmental technology — An all-inclusive term used to describe pollution control devices and systems, waste treatment processes and storage facilities, and site remediation technologies and their components that may be utilized to remove pollutants or contaminants from, or to prevent them from entering, the environment. Examples include wet scrubbers (air), soil washing (soil), granulated activated carbon unit (water), and filtration (air, water). Usually, this term applies to hardware-based systems; however, it can also apply to methods or techniques used for pollution prevention, pollutant reduction, or containment of contamination to prevent further movement of the contaminants, such as capping, solidification or vitrification, and biological treatment.

Equivalent Document: A set of documents that contains all the information and management controls (signatures) as the required documents used in the Standard.

Estimate — A characteristic from the sample from which inferences on parameters can be made.

Evidentiary records — Any records identified as part of litigation and subject to restricted access, custody, use, and disposal.

Expedited change — An abbreviated method of revising a document at the work location where the document is used when the normal change process would cause unnecessary or intolerable delay in the work.

Extramural Agreement: Legal agreement between EPA and a non-EPA organization for the acquisition of items or services by EPA or financial assistance to a non-EPA organization. Such agreements include acquisition agreements (e.g., contracts, work assignments, delivery orders, task orders), assistance agreements (e.g., cooperative agreements, research grants, state and local grants), and EPA-funded IAs with other governmental entities.

Field blank — A blank used to provide information about contaminants that may be introduced during sample collection, storage, and transport. A clean sample, carried to the sampling site, exposed to sampling conditions, returned to the laboratory, and treated as an environmental sample.

Field (matrix) spike — A sample prepared at the sampling point (i.e., in the field) by adding a known mass of the target analyte to a specified amount of the sample. Field matrix spikes are used, for example, to determine the effect of the sample preservation, shipment, storage, and preparation on analyte recovery efficiency (the analytical bias).

Field split samples — Two or more representative portions taken from the same sample and submitted for analysis to different laboratories to estimate interlaboratory precision.

Financial assistance — The process by which funds are provided by one organization (usually governmental) to another organization for the purpose of performing work or furnishing services or items. Financial assistance mechanisms include grants, cooperative agreements, and governmental interagency agreements.

Finding — An assessment conclusion that identifies a condition having a significant effect on an item or activity. An assessment finding may be positive or negative, and is normally accompanied by specific examples of the observed condition.

Goodness-of-fit test — The application of the chi square distribution in comparing the frequency distribution of a statistic observed in a sample with the expected frequency distribution based on some theoretical model.

Grade — The category or rank given to entities having the same functional use but different requirements for quality.

Graded approach — The process of basing the level of application of managerial controls applied to an item or work according to the intended use of the results and the degree of confidence needed in the quality of the results. (See also Data Quality Objectives (DQO) Process.)

Guidance — A suggested practice that is not mandatory, intended as an aid or example in complying with a standard or requirement.

Guideline — A suggested practice that is not mandatory in programs intended to comply with a standard.

Handbook: A non-mandatory compilation of advice, examples, best practices, or past experiences, may be revised according to the issuing Office's Peer Review Policy.

Hazardous waste — Any waste material that satisfies the definition of hazardous waste given in 40 CFR 261, "Identification and Listing of Hazardous Waste."

Holding time — The period of time a sample may be stored prior to its required analysis. While exceeding the holding time does not necessarily negate the veracity of analytical results, it causes the qualifying or "flagging" of any data not meeting all of the specified acceptance criteria.

Identification error — The misidentification of an analyte. In this error type, the contaminant of concern is unidentified and the measured concentration is incorrectly assigned to another contaminant.

Independent assessment — An assessment performed by a qualified individual, group, or organization that is not a part of the organization directly performing and accountable for the work being assessed.

Information: For purposes of this Standard, information means any communication or representation of knowledge such as facts or data, in any medium or form, including, but not limited to, textual, numerical, graphic, cartographic, narrative, or audiovisual forms.

Information System: An organized collection, storage, and presentation system of data for decision making, progress reporting, and for planning and evaluation of programs. It can be either manual or computerized, or a combination of both.

Information Technology: The study, design, development, implementation, support, or management of computer-based information systems, particularly software applications and computer hardware.

Informative: Non-mandatory advice on how to achieve a goal or meet a requirement.
Integrity (Information): The assurance that the information is protected from unauthorized access or change and is not compromised through corruption or falsification.

Inspection — The examination or measurement of an item or activity to verify conformance to specific requirements.

Integrity (Information): The assurance that the information is protected from unauthorized access or change and is not compromised through corruption or falsification.

Internal standard — A standard added to a test portion of a sample in a known amount and carried through the entire determination procedure as a reference for calibrating and controlling the precision and bias of the applied analytical method.

Item — An all-inclusive term used in place of the following: appurtenance, facility, sample, assembly, component, equipment, material, module, part, product, structure, subassembly, subsystem, system, unit, documented concepts, or data.

Laboratory split samples — Two or more representative portions taken from the same sample and analyzed by different laboratories to estimate the interlaboratory precision or variability and the data comparability.

Life Cycle: The life span of a product or service from its initial planning and development, to its use and maintenance, and to its final closure or disposal.

Limit of quantitation — The minimum concentration of an analyte or category of analytes in a specific matrix that can be identified and quantified above the method detection limit and within specified limits of precision and bias during routine analytical operating conditions.

Management — Those individuals directly responsible and accountable for planning, implementing, and assessing work.

Management Controls: A system of management functions to enable managers to determine that the operations of a program or organization satisfy predetermined goals and objectives, that performance is in line with standards and specifications, and to implement any remedial actions needed to ensure that human and other resources are being used in the most effective and efficient way possible in achieving the organization's mission.

Management System: A system to establish policy and objectives and to achieve those objectives (ISO 9001). A management system may describe the policies, objectives, principles, authority, responsibilities, accountability, and implementation plan of an organization for conducting work and producing products and services. Management systems include ISO 9001 on quality management, ISO 14001 on environmental management, and OHSAS 18000 on occupational health and safety.

Management Systems Review (MSR) — The qualitative assessment of a data collection operation and/or organization(s) to establish whether the prevailing quality management structure, policies, practices, and procedures are adequate for ensuring that the type and quality of data needed are obtained.

Matrix spike — A sample prepared by adding a known mass of a target analyte to a specified amount of matrix sample for which an independent estimate of the target analyte concentration is available. Spiked samples are used, for example, to determine the effect of the matrix on a method's recovery
efficiency.

May — When used in a sentence, a term denoting permission but not a necessity.

Mean (arithmetic) — The sum of all the values of a set of measurements divided by the number of values in the set; a measure of central tendency.

Mean squared error — A statistical term for variance added to the square of the bias.

Measurement and Testing Equipment (M&TE) — Tools, gauges, instruments, sampling devices, or systems used to calibrate, measure, test, or inspect in order to control or acquire data to verify conformance to specified requirements.

Memory effects error — The effect that a relatively high concentration sample has on the measurement of a lower concentration sample of the same analyte when the higher concentration sample precedes the lower concentration sample in the same analytical instrument.

Metadata: The information about data required to facilitate its use, understanding, and management. For example, metadata should answer questions about data such as why they were collected, how they were collected and by whom, what was done to the data, what they were used for, what were their limitations, and what were the acceptance criteria.

Method — A body of procedures and techniques for performing an activity (e.g., sampling, chemical analysis, quantification), systematically presented in the order in which they are to be executed.

Method blank — A blank prepared to represent the sample matrix as closely as possible and analyzed exactly like the calibration standards, samples, and quality control (QC) samples. Results of method blanks provide an estimate of the within-batch variability of the blank response and an indication of bias introduced by the analytical procedure.

Mid-range check — A standard used to establish whether the middle of a measurement method's calibrated range is still within specifications.

Mixed waste — A hazardous waste material as defined by 40 CFR 261 Resource Conservation and Recovery Act (RCRA) and mixed with radioactive waste subject to the requirements of the Atomic Energy Act.

Model: A simplification of reality that is constructed to gain insights into select attributes of a physical, biological, economic, or social system. A formal representation of the behavior of system processes, often in mathematical or statistical terms. The basis can also be physical or conceptual.

Monitoring Technician - APCD staff person or contactor that is responsible for the operations and repair of an air quality monitoring site. The monitoring technician has more responsibilities than a site operator and is someone who is sufficiently trained to repair analytical equipment and is capable of determining data validity. APCD monitoring technicians can also fill the role of a site operator.

Must — When used in a sentence, a term denoting a requirement that has to be met.

Nonconformance — A deficiency in a characteristic, documentation, or procedure that renders the quality of an item or activity unacceptable or indeterminate; non-fulfillment of a specified requirement.

Normative: A mandatory set of rules that must be followed.

Occupational Safety and Health Administration — (OSHA)

Objective evidence — Any documented statement of fact, other information, or record, either quantitative or qualitative, pertaining to the quality of an item or activity, based on observations, measurements, or tests that can be verified.

Objectivity (Information): The assurance that information is presented in an accurate, clear, complete, and unbiased manner, and, as a matter of substance, is accurate, reliable, and unbiased.

Observation — An assessment conclusion that identifies a condition (either positive or negative) that does not represent a significant impact on an item or activity. An observation may identify a condition that has not yet caused a degradation of quality.

Organization — A company, corporation, firm, enterprise, or institution, or part thereof, whether incorporated or not, public or private, that has its own functions and administration.

Organization structure — The responsibilities, authorities, and relationships, arranged in a pattern, through which an organization performs its functions.

Outlier — An extreme observation that is shown to have a low probability of belonging to a specified data population.

Parameter — A quantity, usually unknown, such as a mean or a standard deviation characterizing a population. Commonly misused for "variable," "characteristic," or "property."

Participant – When used in the context of environmental programs, an organization, group, or individual that takes part in the planning and design process and provides special knowledge or skills to enable the planning and design process to meet its objective.

Peer review — A documented critical review of work generally beyond the state of the art or characterized by the existence of potential uncertainty. Conducted by qualified individuals (or an organization) who are independent of those who performed the work but collectively equivalent in technical expertise (i.e., peers) to those who performed the original work. Peer reviews are conducted to ensure that activities are technically adequate, competently performed, properly documented, and satisfy established technical and quality requirements. An in-depth assessment of the assumptions, calculations, extrapolations, alternate interpretations, methodology, acceptance criteria, and conclusions pertaining to specific work and of the documentation that supports them. Peer reviews provide an evaluation of a subject where quantitative methods of analysis or measures of success are unavailable or undefined, such as in research and development.

Performance Evaluation (PE) — A type of audit in which the quantitative data generated in a measurement system are obtained independently and compared with routinely obtained data to evaluate the proficiency of an analyst or laboratory.

Policy: A high-level statement about an Agency requirement designed to influence and determine decisions, actions, and other matters. It is usually driven by statute, executive order, the mandate of an oversight agency or Congress, or the head of the organization.

Pollution prevention — An organized, comprehensive effort to systematically reduce or eliminate pollutants or contaminants prior to their generation or their release or discharge into the environment.
Population — The totality of items or units of material under consideration or study.

Practice:

- an expected procedure or way of doing of something.
- the carrying out or exercise of an expected procedure or way of doing of something.

Precision — A measure of mutual agreement among individual measurements of the same property, usually under prescribed similar conditions expressed generally in terms of the standard deviation. Refer to Appendix D, Data Quality Indicators, for a more detailed definition.

Precision, Accuracy, Representativeness, Comparability, and Completeness — (PARCC)

Procedure: The required steps, course of action, or processes needed to accomplish or satisfy a policy.

Process: A set of interrelated resources and activities which transforms inputs into outputs. Examples of processes include analysis, design, data collection, operation, fabrication, and calculation.

Product: The intended result or final output of an activity or process that is disseminated or distributed among EPA organizations or outside of EPA.

Project — An organized set of activities within a program.

Qualified data — Any data that have been modified or adjusted as part of statistical or mathematical evaluation, data validation, or data verification operations.

Qualified services — An indication that suppliers providing services have been evaluated and determined to meet the technical and quality requirements of the client as provided by approved procurement documents and demonstrated by the supplier to the client's satisfaction.

Quality: The totality of features and characteristics of a product or service that bear on its ability to meet the stated or implied needs and expectations of the user.

Quality Assurance (QA): A management or oversight function that deals with setting policy and running an administrative system of management controls that cover planning, implementation, review and maintenance to ensure products and services are meeting their intended use.

Quality Assurance Division — (QAD)

Quality Assurance Management Staff — (now QAD)

Quality Assurance Manager (QAM): The individual designated as the principal manager within the organization having management oversight and responsibilities for planning, documenting, coordinating, and assessing the effectiveness of the QMS for the organization. Note: Other personnel having QA or QC duties may be referred to as QA Officer and QA Coordinator.

Quality Assurance Officer (QAO): See QAM

Quality Assurance Program Description/Plan — See quality management plan.

Quality Assurance Project Plan (QAPP): A document describing in comprehensive detail the necessary QA, QC, and other technical activities that must be implemented to ensure that the results of the work performed will satisfy the stated performance objectives and criteria.

Quality Control (QC): The overall system of technical activities that measure the attributes and performance of a process, item, or service against defined standards to verify that they meet the stated requirements established by the customer; operational techniques and activities that are used to fulfill requirements for quality.

Quality control (QC) sample — An uncontaminated sample matrix spiked with known amounts of analytes from a source independent of the calibration standards. Generally used to establish intra- laboratory or analyst-specific precision and bias or to assess the performance of all or a portion of the measurement system.

Quality improvement — A management program for improving the quality of operations. Such management programs generally entail a formal mechanism for encouraging worker recommendations with timely management evaluation and feedback or implementation.

Quality indicators – measurable attributes of the attainment of the necessary quality for a particular environmental decision. Indicators of quality include precision, bias, completeness, representativeness, reproducibility comparability, and statistical confidence.

Quality Management: That aspect of the overall quality management system of the organization that determines and implements the quality policy. Quality management typically includes strategic planning, allocation of resources, and other systematic activities (e.g., planning, implementation, and assessment) pertaining to the application of quality practices to the organization's programs.

Quality Management Plan (QMP): A formal document or manual that describes the QMS in terms of the organizational structure, functional responsibilities of management and staff, lines of authority, and required interfaces for those planning, implementing, and assessing all activities conducted.

Quality Management System (QMS): A structured and documented management system describing the policies, objectives, principles, organizational authority, responsibilities, accountability, and implementation plan of an organization for ensuring quality in its work processes, products (items), and services. The QMS provides the framework for planning, implementing, documenting, and assessing work performed by the organization and for carrying out required QA and QC activities.

Quality Program: The totality of management controls, processes, and documentation in planning, implementation, and assessment of applying quality to the creation of Agency products and services..

Quality system — A structured and documented management system describing the policies, objectives, principles, organizational authority, responsibilities, accountability, and implementation plan of an organization for ensuring quality in its work processes,

products (items), and services. The quality system provides the framework for planning, implementing, and assessing work performed by the organization and for carrying out required quality assurance (QA) and quality control (QC).

Radioactive waste — Waste material containing, or contaminated by, radionuclides, subject to the requirements of the Atomic Energy Act.

Readiness review — A systematic, documented review of the readiness for the start-up or continued use of a facility, process, or activity. Readiness reviews are typically conducted before proceeding beyond project milestones and prior to initiation of a major phase of work.

Record: A document stating results retrieved or providing evidence of activities (ISO 9000:2005). NOTE: A federal record is an information resource in any format that is needed to describe Agency activities (44 U.S.C. § 3301).

Record (quality) — A document that furnishes objective evidence of the quality of items or activities and that has been verified and authenticated as technically complete and correct. Records may include photographs, drawings, magnetic tape, and other data recording media.

Recovery — The act of determining whether or not the methodology measures all of the analyte contained in a sample. Refer to Appendix D, Data Quality Indicators, for a more detailed definition.

Remediation — The process of reducing the concentration of a contaminant (or contaminants) in air, water, or soil media to a level that poses an acceptable risk to human health.

Repeatability — The degree of agreement between independent test results produced by the same analyst, using the same test method and equipment on random aliquots of the same sample within a short time period.

Reporting limit — The lowest concentration or amount of the target analyte required and reported from a data collection project. Reporting limits are generally greater than detection limits and are usually not associated with a probability level.

Representativeness — A measure of the degree to which data accurately and precisely represent a characteristic of a population, a parameter variation at a sampling point, a process condition, or an environmental condition. See also Appendix D, Data Quality Indicators.

Reproducibility — The precision (usually expressed as variance) that measures the variability among the results of measurements of the same sample at different laboratories.

Required Element: An element whose presence is obligatory in a Standard.

Requirement: An expression of the content of a Standard conveying a criterion to be fulfilled if compliance is to be claimed and from which no deviation is permitted.

Research (applied) — A process, the objective of which is to gain the knowledge or understanding necessary for determining the means by which a recognized and specific need may be met.

Research (basic) — A process, the objective of which is to gain fuller knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications toward processes or products in mind.

Research development/demonstration — The systematic use of the knowledge and understanding gained from research and directed toward the production of useful materials, devices, systems, or methods, including prototypes and processes.

Resource Conservation and Recovery Act — (RCRA)

Round-robin study — A method validation study involving a predetermined number of laboratories or analysts, all analyzing the same sample(s) by the same method. In a round-robin study, all results are compared and used to develop summary statistics such as interlaboratory precision and method bias or recovery efficiency.

Ruggedness study — The carefully ordered testing of an analytical method while making slight variations in test conditions (as might be expected in routine use) to determine how such variations affect test results. If a variation affects the results significantly, the method restrictions are tightened to minimize this variability.

Scientific method — The principles and processes regarded as necessary for scientific investigation, including rules for concept or hypothesis formulation, conduct of experiments, and validation of hypotheses by analysis of observations.

Self-assessment — The assessments of work conducted by individuals, groups, or organizations directly responsible for overseeing and/or performing the work.

Sensitivity — the capability of a method or instrument to discriminate between measurement responses representing different levels of a variable of interest. Refer to Appendix D, Data Quality Indicators, for a more detailed definition.

Service — A discrete function that performs operations and returns a set of results to an external requester. The result generated by activities at the interface between the supplier and the customer, and the supplier internal activities to meet customer needs. Such activities in environmental programs include design, inspection, laboratory and/or field analysis, repair, and installation.

Shall — A term denoting a requirement that is mandatory whenever the criterion for conformance with the specification permits no deviation. This term does not prohibit the use of alternative approaches or methods for implementing the specification so long as the requirement is fulfilled.

Should — A term denoting a guideline or recommendation whenever noncompliance with the specification is impermissible.

Significant condition — Any state, status, incident, or situation of an environmental process or condition, or environmental technology in which the work being performed will be adversely affected sufficiently to require corrective action to satisfy quality objectives or specifications and safety requirements.

Site Operator – The persons who are responsible for performing general maintenance of an air quality monitoring site. Local contractors that are hired to perform general maintenance on air monitoring sites but are not sufficiently trained to determine data validity or perform repairs are classified as site operators.

Software life cycle — The period of time that starts when a software product is conceived and ends when the software product is no longer available for routine use. The software life cycle typically includes a requirement phase, a design phase, an implementation phase, a test phase, an installation and check-out phase, an operation and maintenance phase, and sometimes a retirement phase.

Source reduction — Any practice that reduces the quantity of hazardous substances, contaminants, or pollutants.

Span check — A standard used to establish that a measurement method is not deviating from its calibrated range.

Specification — A document stating requirements and referring to or including drawings or other relevant documents. Specifications should indicate the means and criteria for determining conformance.

Spike — A substance that is added to an environmental sample to increase the concentration of target analytes by known amounts; used to assess measurement accuracy (spike recovery). Spike duplicates are used to assess measurement precision.

Specification: A document stating requirements and which refers to or includes drawings or other relevant documents. Specifications should indicate the means and the criteria for determining conformance.

Split samples — Two or more representative portions taken from one sample in the field or in the laboratory and analyzed by different analysts or laboratories. Split samples are quality control (QC) samples that are used to assess analytical variability and comparability.

Standard: An accepted, consensus-based specification which defines systems, processes, methodologies, or practices. It provides a basis for assuring consistent and acceptable minimum levels of quality, performance, safety, and reliability. Standards usually are included in or accompany procedures.

Standard deviation — A measure of the dispersion or imprecision of a sample or population distribution expressed as the positive square root of the variance and has the same unit of measurement as the mean.

Standard Operating Procedure (SOP) — A written document that details the method for an operation, analysis, or action with thoroughly prescribed techniques and steps and that is officially approved as the method for performing certain routine or repetitive tasks.

Standard Reference Material — (SRM)

Supplier — Any individual or organization furnishing items or services or performing work according to a procurement document or a financial assistance agreement. An all-inclusive term used in place of any of the following: vendor, seller, contractor, subcontractor, fabricator, or consultant.

Surrogate spike or analyte — A pure substance with properties that mimic the analyte of interest. It is unlikely to be found in environmental samples and is added to them to establish that the analytical method has been performed properly.

Surveillance (quality) — Continual or frequent monitoring and verification of the status of an entity and the analysis of records to ensure that specified requirements are being fulfilled.

Technical review — A documented critical review of work that has been performed within the state of the art. The review is accomplished by one or more qualified reviewers who are independent of those who performed the work but are collectively equivalent in technical expertise to those who performed the original work. The review is an in-depth analysis and evaluation of documents, activities, material, data, or items that require technical verification or validation for applicability, correctness, adequacy, completeness, and assurance that established requirements have been satisfied.

Technical Systems Audit (TSA) — A thorough, systematic, on-site qualitative audit of facilities, equipment, personnel, training, procedures, recordkeeping, data validation, data management, and reporting aspects of a system.

Traceability — The ability to trace the history, application, or location of an entity by means of recorded identifications. In a calibration sense, traceability relates measuring equipment to national or international standards, primary standards, basic physical constants or properties, or reference materials. In a data collection sense, it relates calculations and data generated throughout the project back to the requirements for the quality of the project.

Trip blank — A clean sample of a matrix that is taken to the sampling site and transported to the laboratory for analysis without having been exposed to sampling procedures.

Usability Assessment: The evaluation of data based upon the results of data validation and verification for the decision(s) being made. Reviewers assess whether the process execution and resulting data meet quality objectives based on the criteria given in the QAPP.

User – When used in the context of environmental programs, an organization, group, or individual that utilizes the results or products from environmental programs. A user may also be the client for whom the results or products were collected or created.

Utility (Information): The assurance that information is useful for its intended purpose.

Validation (Information): The confirmation by examination and provision of objective evidence that the particular requirement for which the information is intended are fulfilled; the process of determining whether the specifications were appropriate and that the verified results will meet the data user's needs.

Variance (statistical) — A measure or dispersion of a sample or population distribution. Population variance is the sum of squares of deviation from the mean divided by the population size (number of elements). Sample variance is the sum of squares of deviations from the mean divided by the degrees of freedom (number of observations minus one).

Verification (Information): The confirmation by examination and provision of objective evidence that validated information fulfills specified requirements; the process of checking whether the information met the project's specifications as part of an agreement or contract.

Work – The process of performing a defined task or activity (e.g., research and development, field sampling, analytical operations, equipment fabrication).

Acronyms and Abbreviations

AAMG	Ambient Air Monitoring Group
ACS	American Chemical Society
ADBA	AIRS database administrator
ADQ	audit of data quality
AIRS	Aerometric Information Retrieval System
AMTIC	Ambient Monitoring Technical Information Center
ANSI	American National Standards Institute
APCD	Air Pollution Control Division
APCD ADR	APCD Annual Data Report
APCD ANR	APCD Annual Network Review
APCD NMP	APCD Network Monitoring Plan
APCD MNA	APCD Monitoring Network Assessment
APTI	Air Pollution Training Institute
AQAD	Air Quality Assessment Division
AQI	Air Quality Index
AQS	Air Quality System
AQSSD	Air Quality Strategies and Standards Division
ARM	approved regional method
ASCQ	American Society for Quality Control
ASQ	American Society for Quality
ASTM	American Society for Testing and Materials
AWMA	Air and Waste Management Association
BLM	Bureau of Land Management
CAA	Clean Air Act
CASNET	Clean Air Status and Trends Network
CBI	confidential business information
CBSA	core-based statistical area
CDPHE	Colorado Department of Public Health and Environment
CFR	Code of Federal Regulations
CIO	Chief Information Officer
CL	confidence limit
CMD	Contracts Management Division
CMDSS	Continuous Monitoring and Data System Support Unit
CMSA	combined metropolitan statistical area
CMZ	community monitoring zone
CO	carbon monoxide
COC	chain of custody
CPU	central processing unit
CRM	certified reference material
CSA	combined statistical area
CSN PM2.5	Chemical Speciation Network
CV	coefficient of variation
DAS	data acquisition system
DASC	Data Assessment Statistical Calculator
DC	direct current
DCO	Document Control Officer
DD	Division Director
DL	detection limit

DOP	digital aerosol photometer
DOP	dioctylphthalate
DQA	data quality assessment
DQI	data quality indicators
DQO	data quality objectives
DQOA	Deputy QA officers
EDO	environmental data operation
EDERF	energy dispersive x-ray fluorescence
EMAD	Emissions, Monitoring, and Analysis Division
EPA	Environmental Protection Agency
EPAAR	EPA Acquisition Regulations
ESD	Emissions Standards Division
ETSD	Enterprise Technology Services Division
FAR	Federal Acquisitions Regulations
FEM	federal equivalent method
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FIPS	Federal Information Processing Standards
FORMS	field operations and records management system
FR	flow rate
FRM	federal reference method
FTIR	fourier transform infrared (spectroscopy)
GC/MS	gas chromatography mass spectrometry
GIS	geographical information systems
GLP	good laboratory practice
GMIS	gas manufactures internal standards
GPC	global positioning system
HAP	hazardous air pollutants
HC	hydrocarbon
HEPA	High Efficiency Particulate Air
HPLC	high performance liquid chromatography
HVAC	heating, ventilating and air conditioning
IAG	interagency agreement
ICP	inductively coupled plasma
IDP	individual development plans
IMPROVE	Interagency Monitoring of Protected Visual Environments
IQG	information quality guidelines
ISO	Internal Organization for Standardization (not an acronym)
IT	information technology
ITPID	Information Transfer and Program Integration Division
LAN	local area network
LDL	lower detectable limit
LED	light-emitting diode
LIMS	laboratory information management system
LOD	limit of detection
LOQ	limit of quantitation
LIMS	laboratory information management systems
MACT	maximum achievable control technology
MCL	maximum contamination level
MDL	method detection limit
MFC	mass flow control

MPA	monitoring planning area
MPC	measurement performance criteria
MQAG	Monitoring and Quality Assurance Group
MQO	measurement quality objectives
MSA	Metropolitan Statistical Area
MSR	management system review
NAAQS	National Ambient Air Quality Standards
NACAA	National Association of Clean Air Agencies
NADP	National Atmospheric Deposition Program
NAMS	National Air Monitoring Station
NATTS	National Air Toxics Trends Sites
NCore	National Core Network
NECTA	New England city and town area
NEIC	National Enforcement Investigations Center
NERL	National Environmental Research Laboratory
NESHAP	National Emission Standards for Hazardous Air Pollutants
NF	National Formulary
NIST	National Institute of Standards and Technology
NOAA	National Oceanic Atmospheric Administration
NO	nitrogen oxide
NO2	nitrogen dioxide
NOx	oxides of nitrogen (NO and NO_2)
NOy	NOx + NOz
NOz	HNO_3 + HONO + $2N_2O_5$ + HO_2NO_2 + PAN + NO_3 + Organic Nitrates (but not NH_3)
NPS	National Park Service
NPAP	National Performance Audit Program
NPEP	National Performance Evaluation Program
NREL	National Renewable Energy Laboratory
NSPS	New Source Performance Standard
NTAA	National Tribal Air Association
NTEC	National Tribal Environmental Council
NTRM NIST	traceable reference material
NVLAP	National Voluntary Laboratory Accreditation Program
O3	ozone
OAQPS	Office of Air Quality Planning and Standards
OARM	Office of Administrative and Resources Management
OEI	Office of Environmental Information
OMB	Office of Management and Budget
ORD	Office of Research and Development
ORIA	Office of Radiation and Indoor Air
ORIM	Office of Information Resources Management
OSWER	Office of Solid Waste Emergency Response
P_a	pressure, ambient
P&A	precision and accuracy
PAN	Peroxyacytyl nitrate ($C_2H_3O_5N$), an important component of smog
PAMS	Photochemical Assessment Monitoring Stations
PC	personal computer
PCB	polychlorinated biphenyls
PDFID	Cryogenic Pre-concentration and Direct Flame Ionization Detection

PC	personal computer
PD	percent difference
PDW	primary wind direction
PE	performance evaluation
PEP $PM_{2.5}$	Performance Evaluation Program
PBMS	performance based measurement system
PM	Particulate Matter
$PM_{2.5}$	Particulate Matter ≤ 2.5 microns
PM_{10}	Particulate Matter ≤ 10 microns
PMP	polymethylpentene
PMSA	Primary Metropolitan Statistical Area
^{210}Po	Polonium-210
POC	pollutant occurrence code
ppb	part per billion
ppm	part per million
PR	procurement request
PSD	Prevention of Significant Deterioration
PQAO	primary quality assurance organization
PQL	practical quantitation limit
PQO	project quality objectives
PRP	potentially responsible parties
PT	proficiency test
PTFE	polytetrafluoroethylene
PWD	primary wind direction
Q_a	sampler flow rate at actual conditions
QA	quality assurance
QA/QC	quality assurance/quality control
QAAR	quality assurance annual report
QAARWP	quality assurance annual report and work plan
QAD EPA	Quality Assurance Division
QAM	quality assurance manager
QAO	quality assurance officer
QAPP	quality assurance project plan
QC	quality control
QL	quantitation limit
QMP	quality management plan
QMS	quality management system
RCRA	Resource Conservation Recovery Act
RH	relative humidity
RPO	regional planning organization
RSD	relative standard deviation
SAMWG	Standing Air Monitoring Work Group
SCG	Source Characterization Group
SD	standard deviation
SIPS	State Implementation Plans
SIRMO	Servicing Information Resources Management Officer
SLAMS	state and local monitoring stations
SO_2	Sulfur Dioxide
SOP	standard operating procedure
SOW	scope (or statement) of work

SPMS	special purpose monitoring stations
SRM	standard reference material
SRP	standard reference photometer
SCC	sharp-cut cyclone
STN PM2.5	Speciation Trends Network (a subset of Chemical Speciation Network)
SVOC	semi-volatile organic hydrocarbon
SYSOP	system operator
T_a	temperature, ambient
TAD	technical assistance document
TEOM	tapered element oscillating microbalance
TIP	tribal implementation plan
TSA	technical system audit
TSCA	Toxic Substances Control Act
TSP	total suspended particulate
TSP	Technical Services Program
TTL	transistor-transistor logic
UFP	Uniform Federal Policy
USB	universal serial bus
USGS	U.S. Geological Survey
UTM	universal transverse Mercator
USFS	US Forest Service
USP	US Pharmacopeia
VAC	volts of alternating current
VSCC	very sharp-cut cyclone
VOC	volatile organic carbon
WAM	Work Assignment Officer
WINS	well impactor ninety-six
XRF	X-ray fluorescence