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CHANGE DESCRIPTION FORM

Instructions: AS03 is being transmitted in its entirety. Please replace Version B with Version C and destroy the previous version.

Module: AS03	Version: C	Description: Data Assessment Services
Originator: E. A. Brovsky		

Affected Exhibit	Section No.	Change Description
Cover Page	N/A	New version and Effective date
N/A	Introduction Scope Background	A new introduction, Scope and Background was written to incorporate the BOA SOW and BOA Implementation Requirements documents, GR03 & GR04.
N/A	Entire Document	For clarity, change bars appearing on a Section Title indicate changes to the entire Section.
N/A	Entire Document	All references to partial verification have been eliminated throughout this document.
N/A	Entire Document	All references to complete verification have been changed to “verification” throughout this document.
Exhibit B	2.1	The entire Delivery Schedule section was rewritten. <ul style="list-style-type: none"> ▪ A One-Business Day Validation deliverable was defined ▪ The 3 Work Day Verification deliverable was replaced with a One-Business Day deliverable
Exhibit B	2.3	The entire section for the CTR DQA Report package was rewritten to include an electronic DQA transmittal.
Exhibit C	Table C1	The description for DA-LICs AS03C101 and AS03C102 were changed to include all matrices. DA-LICs AS03C103, AS03C104 and AS03C126 were retired.
Exhibit C	1.1.1.2	A second surcharge multiplier was added to address RINs with mixed matrices due to field QC.
Exhibit C	1.4	The Metal LICs for 1 or 2 elements was expanded to 1 to 4 elements.
Exhibit C	1.5.1	The section describing how to select an appropriate parameter based DA-LIC was rewritten (DA-LICs AS03C113 through AS03C116 and AS03C118 through AS03C121).
Exhibit F	2.2	A sentence was added to this section requiring documentation of periodic document reviews.

INTRODUCTION

This document identifies the requirements for the assessment of analytical data generated in support of D&D activities. Comprehensive Verification and Validation (V&V) guidelines, written to method and contractual requirements, are used in the data assessment process to assign data qualifiers and reason codes to individual data points generated under the National Basic Ordering Agreement (BOA)¹. Statement of Work (SOW) and the Rocky Flats Environmental Technology Site (Site) BOA Implementation Requirements documents, GR03 & GR04.

SCOPE

The scope of this SOW includes all activities associated with the V&V of data generated under the BOA SOW and RFETS Specific BOA Implementation Requirements Documents. Data generated under other SOWs may be assessed under the requirements of this document, however, professional judgement will be required on the part of the Subcontractor to appropriately apply applicable sections of the V&V Guidelines.

GENERAL BACKGROUND

All analytical data generated under the BOA SOW, RFETS BOA implementation documents, and other SOWs are subject to data assessment. Data Assessment is a generic term for a quality assurance evaluation of analytical chemistry data. This assessment involves (1) a cursory examination of the data by K-H Analytical Services Division (ASD) personnel prior to customer release of preliminary data, (2) data verification of data by Subcontractor personnel, and (3) validation of data by Subcontractor personnel. The nature and extent of the verification and validation activities are based upon program and customer-specified requirements and the requirements of ASD to evaluate subcontractor laboratory performance against SOW requirements. Verification and validation criteria are generally based on government-published standards and guidelines, primarily Environmental Protection Agency (EPA) Contract Laboratory Program (CLP) and SW-846 method guidelines for organic and inorganic data evaluation and review.

Verification is an assessment process that consists of a review of Sample Data Package (SDP) summary information to evaluate the extent to which the subcontract laboratory met method and subcontract specific quality control and reporting criteria. Verification includes the assignment of data qualifiers and reason codes in both the hardcopy Data Quality Assessment Report and in the Electronic Data Deliverable (EDD).

¹ The Basic Ordering Agreement for Analytical Services is administered by Westinghouse Savannah River Company on behalf of the Department of Energy.

Validation, a more thorough assessment process than verification, involves the inspection of SDP content for both compliance with the SOW and validity of the data using a K-H approved set of verification and validation guidelines. Validation includes the examination of raw data and the calculations used in the data generation process. Validation includes the assignment of data qualifiers and reason codes in both the hardcopy Data Quality Assessment Report and in the Electronic Data Deliverable (EDD).

EXHIBIT A: SUMMARY OF REQUIREMENTS

1. GENERAL REQUIREMENTS

This document contains seven Exhibits that comprise the Data Assessment Services Statement of Work. Exhibit A provides an overview of this SOW and its general requirements. Exhibit B contains all reporting and deliverables requirements. Exhibit C contains the Line Item Codes (LIC) that associate verification/validation to analysis types. Exhibit D contains analytical specific data assessment guidelines. Exhibit E contains general and specific Quality Assurance requirements required under this SOW. Exhibit F contains the evidentiary requirements including, document control requirements that the Subcontractor must follow in processing SDPs under this Subcontract, and specifies requirements for written Standard Operating Procedures (SOPs). To ensure proper understanding of language utilized in this Subcontract, Exhibit G contains a glossary of terms.

1.1. SOW Compliance

Data assessment shall meet all the requirements specified in this SOW and in the Data Assessment Guidelines identified in Exhibit D. All work performed under this SOW shall be done by the Subcontractor under the guidance of the K-H Contractor Technical Representative (CTR).

1.2. Terms and Acronyms

AS03 Exhibit G is a glossary of terms and acronyms used in this document and in the analytical specific data assessment guidelines. The Subcontractor shall use the glossary meaning when a term is used in the text without definition.

1.3. Timelines

Timelines given in terms of days are to be interpreted as calendar days throughout this SOW unless otherwise noted.

1.4. Quality Assurance Requirements

All quality assurance procedures prescribed in Exhibit E of this module shall be strictly adhered to by the Subcontractor.

1.5. Subcontractor Technical Audits

The Subcontractor shall be subject to routine technical audits at the Subcontractor's facility as described in Exhibit E of this module.

1.6. Information Release

Analytical results, data qualification, procedures, data, or similar matters shall not be released by the Subcontractor to a third party without prior written approval of the CTR unless stated otherwise in this SOW.

1.7. **Completeness of Deliverables**

Data Quality Assessment (DQA) Reports, Non-Compliance Notifications (NCN), and electronic data deliverables (EDDs) that are not complete or that are improperly formatted are considered noncompliant to Subcontract requirements.

1.8. **Records Management**

All records or documents acquired or generated by the Subcontractor in its performance of this SOW shall be the property of the Department of Energy.

1.9. **Work Schedule**

Onsite activities shall typically be performed under normal RFETS operating hours, which are 7:00 a.m. through 4:30 p.m., Monday through Friday, with every other Friday as a day off (Alternate Work Schedule or AWS). RFETS Holidays recognized during the yearly schedule include Thanksgiving, the day after Thanksgiving, Christmas, New Year's Day, Memorial Day, Independence Day, and Labor Day. Subcontractor may request approval from the K-H CTR to work additional times to meet client requirements.

1.10. **Plant Rules**

Subcontractor personnel located at the RFETS facility are required to follow all applicable plant rules.

1.11. **Safety**

Potential hazards associated with onsite performance of the SOW are those typically found in an office environment. Potential hazards include but are not limited to the following:

- Slips, trips and falls
- Non-ergonomic work environment
- Lifting less than 20 pounds
- Back and neck strain
- Hand and wrist strain
- Paper cuts
- Others

The Subcontractor is required to follow all RFETS applicable safety and hazard prevention procedures, participate in drills and exercises as necessary, and plan accordingly to produce a safe work product. It is not anticipated that any special equipment or training is required to meet the Site's safety requirements in performance of this scope of work. The Subcontractor must report any and all safety concerns and actual incidents to the K-H CTR.

1.12. **Emergency Preparedness**

1.12.1. Emergency Response: Subcontractor employees working at RFETS shall follow emergency response requirements, to include Sheltering (remain inside building and structure; do not smoke, eat, drink, or use cosmetics) upon direction and until relieved of sheltering requirements. Evacuation when directed will include employees relocating to a specified area or location as indicated by Emergency Response authority.

1.12.2. Subcontractor employees working at RFETS shall be familiar with emergency response procedures, and shall participate in GET, GERT, building indoctrination, or Visitor Indoctrination training programs. Subcontractors shall ensure employees are familiar with emergency notification requirements, to include notifying supervision, use of x2911, and building evacuation/accountability. Subcontractors shall not bring any hazardous material on site without notification to Emergency Management for determination of hazards assessment and consequence assessment.

1.13. **RFETS Required Training**

Subcontractor employees new to RFETS are required to attend General Employee Radiation Training (GERT) at a RFETS' Computer Based Training Center, Building 060, prior to receiving a badge.

- **RFETS Site Orientation** [*contains GERT initial training.*], (One Time ~2 hrs)

Subcontractor personnel located at the RFETS facility are required to successfully complete and pass the following additional Rocky Flats training: For those courses requiring annual or biennial refreshers, the Subcontractor shall ensure the annual training is completed prior to the training expiration date.:

- **General Employee Radiological Site-Specific Training [GERST]**, (Biennially, 0.5 hrs-return-receipt brochure)
- **General Employee Training- Initial (GET-I)**, (One Time, 2 hrs)
- **General Employee Training- Refresher (GET-R)**, (Biennially, 1 hr)
- **Computer Training: Unclassified Computer Security Training Brochure** (One Time, 0.5 hrs)

It is the responsibility of the Subcontractor to schedule training for its employees.

2. **DATA VERIFICATION & VALIDATION**

2.1. **Data Assessment Guidelines**

The Subcontractor shall perform data verification and validation to K-H approved guidelines. A list of currently approved guidelines are provide in Exhibit D of this document.

2.2. **Notification of Significant Data Quality Problems**

The Subcontractor shall immediately notify the CTR of any significant data quality problems identified during the verification or validation of a SDP. Significant data quality problems would be those that cause the majority of data points to be rejected.

2.3. **Assessment Level**

The data assessment level (verification or validation) will be provided to the Subcontractor at the time of the verification/validation request.

2.3.1. *VERIFICATION*: Verification will be performed by the Subcontractor at the RFETS facility according to K-H approved data assessment guidelines.

- 2.3.1.1. **Key Analytical Areas:** Subcontractor personnel performing verification at the RFETS facility shall meet the minimum technical qualifications for key analytical areas involved in their work scope, see Section 5.
- 2.3.1.2. **Government Furnished Equipment And Other Resources at RFETS:** The Subcontractor will be provided with computers, office space, telephone access, office furniture, access to printers, and standard office supplies (paper, pencils, etc), for up to three individuals to perform verification.
- 2.3.1.3. **Verification versus Validation:** When verification results indicate a more extensive review is necessary, the Subcontractor shall contact the CTR or their representative in writing for written directions on how to proceed.
- 2.3.2. **VALIDATION:** Validation will be performed by the Subcontractor according to K-H approved data assessment guidelines.
 - 2.3.2.1. **Use of RFETS Facility:** Validation may be performed at the RFETS facility provided a Data Quality Assessment (DQA) Report Retention Copy is maintained per the requirements of Exhibit F, Section 3 of this document.
 - 2.3.2.2. The Subcontractor shall have no more than 3 individuals performing data assessment at the RFETS facility at any given time unless written approval for additional resources is obtained from the CTR.

3. APPLICATION OF ELECTRONIC DATA QUALIFIERS TO HISTORIC DATA

The Subcontractor shall provide services to apply electronic data qualifiers to historic data that were previously verified or validated but where electronic qualifiers were never entered into ASD databases.

4. ORGANIZATION

The Subcontractor's organization must be clearly structured with well-defined responsibilities for each individual in the management system. This system shall ensure that sufficient resources are maintained to perform the requirements of this SOW. The Subcontractor shall maintain a chart or diagram illustrating the Subcontractor's organizational structure and its interface with technical positions assigned to key analytical areas. The Subcontractor shall provide the CTR a revised organization chart within 14 days of an organizational change.

5. TECHNICAL QUALIFICATIONS

Subcontractor personnel performing data assessment shall meet all requirements of this section.

5.1. General

The following are the minimum technical qualifications for Subcontractor personnel performing work under this SOW.

- 5.1.1. Personnel shall have experience in report and procedure writing.
- 5.1.2. Personnel shall have a BA/BS or MA/MS in chemistry, radiochemistry, geochemistry and/or the physical sciences.
 - 5.1.2.1. Unless otherwise noted, the following technically relevant experience may be substituted for educational requirements, such that:
 - A Master's degree equals a Bachelor's degree and four years of experience
 - A Bachelor's degree equals:
 - ◊ An Associate's degree and four years of experience, which equals
 - ◊ A High School diploma and eight years of experience.
- 5.1.3. Personnel shall have a minimum of one year experience as analytical chemists using EPA analytical methods relevant to assigned key analytical area(s), and one year data assessment experience relevant to assigned key analytical area(s).
- 5.1.4. Personnel shall be knowledgeable in the areas of EPA and Colorado Department of Public Health and Environment regulatory requirements, ASME NQA-1-1989, ANSI/ASQC E4-1994, and DOE Order 414.1A.

5.2. Key Personnel

Key personnel positions shall meet the general technical qualifications except where noted below.

5.2.1. PROJECT MANAGER

- Responsibility: Responsible for all aspects of work performed under this Subcontract.
- Academic Training: Shall meet or exceed General Technical Requirements.
- Experience: A minimum of 1 year experience as an analytical chemist using EPA analytical methods, and at least four years of data assessment experience, with at least two years experience in a supervisor position.

5.2.2. ORGANICS LEAD

- Responsibility: Responsible for all organic data assessments performed under this Subcontract.
- Academic Training: A BA/BS or MA/MS in chemistry, radiochemistry, geochemistry and/or the physical sciences. Experience may not be substituted for the educational requirement.
- Experience: A minimum of two years of laboratory experience using EPA analytical methods for the determination of organic constituents, and at least four years of organic data assessment experience.

5.2.3. INORGANICS LEAD

- Responsibility: Responsible for all inorganic (metals and wet chemistry) data assessments performed under this Subcontract.
- Academic Training: A BA/BS or MA/MS in chemistry, radiochemistry, geochemistry and/or the physical sciences. Experience may not be substituted for the educational requirement.
- Experience: A minimum of two years of laboratory experience using EPA analytical methods for the determination of inorganic constituents, and at least four years of inorganic data assessment experience.

5.2.4. RADIOCHEMISTRY LEAD

- Responsibility: Responsible for all radiochemistry data assessments performed under this Subcontract.
- Academic Training: A BA/BS or MA/MS in chemistry, radiochemistry, geochemistry and/or the physical sciences. Experience may not be substituted for the educational requirement.
- Experience: A minimum of two years of laboratory experience using radiochemical methods that includes alpha spectroscopy for the determination Pu, U, and Am, and at least four years of radiochemical data assessment experience.

5.3. **Key Analytical Positions**

A Key Analytical Position occurs when only one individual meets the general technical requirements for a Key Analytical Area. All Key Analytical Areas shall have at least one designated individual (Key Position) that meets the general technical requirements for that area. A qualified individual may meet the Key Analytical Position requirements for multiple Key Analytical Areas.

5.3.1. *CURRENT RADIOCHEMISTRY KEY ANALYTICAL AREAS:* The Subcontractor shall provide at a minimum, an individual that meets the key position requirements for each of the following Key Analytical Areas:

- Alpha spectrometry
- Gas proportional counting
- Liquid scintillation
- Gamma Spectroscopy

5.3.2. *CURRENT NON-RADIOCHEMISTRY KEY ANALYTICAL AREAS:* The Subcontractor shall provide at a minimum, an individual that meets the key position requirements for each of the following Key Analytical Areas:

- VOAs
- Semivolatiles
- Pesticides/PCBs
- Inorganics (Metals)
- Wet Chemistry Parameters

5.3.3. *PROJECTED KEY ANALYTICAL AREAS:* Subcontractor shall be capable of providing sufficient staff in the following projected key analytical areas as the needs of RFETS warrant:

- Dioxins/Furans
- Herbicides
- Biological and Taxonomic parameters
- EPA Method TO14
- Drinking Water
- Industrial Hygiene
- Radium-226
- Radium-228
- Geotechnical

5.4. **Technical Resumes**

Resumes shall contain sufficient information to ascertain whether or not an individual meets minimum requirements for Key Personnel and for each person assigned to a Key Analytical Area. At a minimum, resumes shall include:

- Position Description
- Title
- Education (pertinent to assigned key analytical area(s))
- Number of Years of Experience (pertinent to assigned key analytical area(s))
- Month and Year Hired
- Previous Experience, and Publications
- Professional Registrations or Certifications

5.4.1. *SCHEDULE:* Key Personnel and persons assigned to Key Analytical Areas cannot be replaced without CTR approval prior to assignment of work under the Subcontract. The Subcontractor shall furnish the CTR with resumes of proposed individuals with the request to replace Key Personnel or persons assigned to Key Analytical Areas.

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EXHIBIT B: REPORTING AND DELIVERABLES REQUIREMENTS

1. INTRODUCTION

AS03 Exhibit B contains reporting and deliverable requirements applicable to this SOW. Deliverables include the CTR Data Quality Assessment (DQA) Report, Laboratory DQA Report, Electronic Qualifiers (E-Qualifiers), Non-Compliance Notifications (NCN), and other miscellaneous deliverables. All days are listed as calendar days from the Verified Date of Receipt (VDR) to the date the item is received by the CTR or designated recipient.

Deliverable requirements and schedules specified in this document shall be met unless CTR approval is given in writing.

2. DATA QUALITY RECORD AND SDP RETURN

This section contains deliverable requirements for the Data Quality Assessment Record and SDP Return. The Data Assessment Record consists of the Data Quality Assessment Report, Data Quality Assessment Report Attachments, and the application of E-Qualifiers to Electronic Data Deliverable (EDD).

2.1. Delivery Schedule

The Schedule of deliverables for Validation, Verification, and the Application of E-Qualifiers are provided in Tables B1 through B3.

TABLE B1: VALIDATION DELIVERABLE SCHEDULE

Turnaround Time Designator	Processing Schedule	Item	Recipient
28d	28-Days	CTR DQA Report Package	CTR
	28-Days	Application of E-Qualifiers	CTR
	Monthly	Laboratory DQA Report	Laboratory
14d	14-Days	CTR DQA Report Package	CTR
	14-Days	Application of E-Qualifiers	CTR
	Monthly	Laboratory DQA Report	Laboratory
3d	3-Day	CTR DQA Report Package	CTR
	3-Day	Application of E-Qualifiers	CTR
	Monthly	Laboratory DQA Report	Laboratory
1d	1-Business Day	CTR DQA Report Package	CTR
	1-Business Day	Application of E-Qualifiers	CTR
	Monthly	Laboratory DQA Report	Laboratory

TABLE B2: VERIFICATION DELIVERABLE SCHEDULE

Turnaround Time Designator	Processing Schedule	Item	Recipient
7d	7-Days	CTR DQA Report Package	CTR
		Application of E-Qualifiers	CTR
1d	1-Business Day	CTR DQA Report Package	CTR
		Application of E-Qualifiers	CTR

TABLE B3: APPLICATION OF E-QUALIFIERS TO PREVIOUSLY ASSESSED DATA

Turnaround Time Designator	Processing Schedule	Item	Recipient
7d	7-Days	Apply E-Qualifiers to EDD	CTR

2.2. DQA Report General Requirements

The Subcontractor shall prepare written DQA Reports according to the requirements provided in DA-GR01. These reports shall describe the results of the data verification/validation, describe SOW non-compliance, and make recommendations based on the assessment results.

- 2.2.1. *REPORT CONTENTS*: Data Quality Assessment Reports shall contain all information described in DA-GR01 Section 7.
- 2.2.2. *REPORTING FORMS*: Formats for the DQA reports shall conform to those provided in the analytical specific data assessment guidelines listed in Exhibit D, Table D1.

2.3. CTR DQA Report Package

The CTR DQA Report Package shall contain the DQA Report (electronic copy & Hardcopy), DQA Report Attachments, and the original SDP.

- 2.3.1. *DQA REPORT*: The DQA report shall be delivered in both hardcopy and as an electronic copy in Portable Document Format (PDF).
 - 2.3.1.1. **CTR DQA Report Hardcopy**: The hardcopy CTR DQA Report Package shall contain original documents and all required signature(s).
 - 2.3.1.2. **DQA Report Electronic Copy**: Only the DQA report (no attachments) shall be provided as a PDF file using the file naming convention identified in DA-GR01. Signature line(s) shall contain the designation “/s/” to indicate the signature is on file.
 - 2.3.1.2.1. Wherever possible, PDF files should be created by printing directly to Adobe Acrobat as this results in maximum legibility and minimum file size.

- 2.3.1.2.2. Scanned images should be scanned in black and white (1 bit) mode at 150 to 300 dpi. Lower dpi is preferable but may not be acceptable for small text.
- 2.3.1.2.3. Consideration should be given to scanning in color only for low contrast color print. Legibility, however, is more important than file size.
- 2.3.1.2.4. Portable document format (PDF) files should be version 1.3 or higher.

2.3.2. *DQA REPORT ATTACHMENTS*

- 2.3.2.1. **Data Validation Worksheets** (if applicable): All data validation worksheets or other related documentation shall be included as an attachment to the CTR DQA Report Package.
- 2.3.2.2. **Non-Compliance Notification (NCN)**: The Subcontractor shall attach a copy of all cited NCNs, with resolutions, to the CTR DQA Report Package. NCNs shall contain the information described in the example NCN provided as Attachment 2 of DA-GR01. All NCNs shall be processed by the Subcontractor at the RFETS facility using the K-H NCN Tracking Database software. The NCNs shall be processed by the Subcontractor as follows:
 - NCNs shall be entered into the K-H NCN Tracking Database.
 - The appropriate K-H Laboratory CTR shall be notified of the issuance of the NCN. This can be accomplished by an email notification or by hardcopy.
 - The K-H Laboratory CTR will provide the Subcontractor with the Laboratory's NCN resolution.
 - The Subcontractor shall evaluate the Laboratory's resolution and, if acceptable, shall update the K-H NCN Tracking Database and notify the Laboratory CTR that the NCN was closed.
 - If a laboratory's NCN resolution does not adequately address the deficiency, the Subcontractor shall notify, in writing, the appropriate K-H Laboratory CTR of the issue.
- 2.3.2.3. **EDD Record**: The Subcontractor shall supply Data Summary Forms with hand entered data qualifiers and reason codes for all Validations and for Verifications when an EDD is not available at the time of the Data Assessment Request. The Data Summary Forms shall be delivered as a DQA Report attachment per the CTR DQA Report Package delivery schedule provided in Tables B1 & B2.

2.4. **CTR DQA Report Package Transmittal**

- 2.4.1. **HARDCOPY TRANSMITTAL**: The DQA Report, and DQA Report Attachments shall be attached to each SDP related to that work and transmitted under custody to the CTR or their designee per the schedule identified in Tables B1 and B2.

2.4.2. *ELECTRONIC COPY TRANSMITTAL*: The DQA Electronic Report may be transmitted to the Site by email or by CD-ROM per the schedule identified in Tables B1 and B2. The CTR will provide an email address for transmittal.

2.5. **Laboratory DQA Report**

The Subcontractor shall provide Validation DQA Reports (w/o DQA Report Attachments) to the laboratory that originated the SDP on a monthly basis. The Laboratory DQA Report, however, shall not be provided to the laboratory sooner than 7 days from K-H receipt of the CTR DQA Report Package. All costs associated with the distribution of the Laboratory DQA Report shall be the responsibility of the Subcontractor.

2.6. **Application of E-Qualifiers to Electronic Data Deliverable**

2.6.1. *SUBCONTRACTOR VERIFIED OR VALIDATED DATA*: Onsite Subcontractor personnel shall add data qualifiers and reason codes to the EDD using a K-H provided data entry application. Data qualifiers and reason codes shall be added to both verified and validated data per the schedule provided in Table B3. The cost of applying E-Qualifiers shall be included in the verification or validation unit price.

2.6.2. *APPLICATION OF E-QUALIFIERS TO HISTORIC DATA*: This section applies to previously assessed SDPs that have not had E-Qualifiers applied to the EDD as part of the data assessment process. K-H shall identify the SDPs that are applicable to this section.

2.6.2.1. **GRRASP SOW Generated Data**: The application of E-Qualifiers to data generated under the GRRASP Statement of Work shall include the following:

- Interpret Data Assessment Reports to assign data qualifiers and appropriate reason codes.
- Using the Rocky Flats Environmental Data System (RFEDS) V&V Application, select a subset of data from the Soil and Water Database (SWD) that corresponds to information supplied on validation reports. Identify this data as a virtual SDP.
- Compare each sample results in SWD against the Form 1(s) included with the validation report. If Form 1s were not provided with the validation report, reason code [705] shall be applied to all sample result data to indicate the hard copy SDP was unavailable at the time electronic qualifiers were applied.
- Apply electronic data qualifiers and reason codes using, the RFEDS V&V Application, based on the information contained in validation reports.

2.6.2.2. **SOW for Analytical Measurements or BOA Generated Data**: The application of E-Qualifiers and reason codes to data generated under the SOW for Analytical Measurements or to data generated under the BOA shall be performed using a K-H provided data entry application. The application of qualifiers and reason codes shall include a comparison between the electronic sample results and each result

provided on the Form1(s) included with the validation report. If Form 1s were not provided with the validation report, reason code [705] shall be applied to all sample result data to indicate the hard copy SDP was unavailable at the time electronic qualifiers were applied.

- 2.6.3. *EDD DISCREPANCIES*: Discrepancies and errors in the EDD are to be immediately reported to the CTR or their representative in writing. The CTR will provide written guidance for how and when to proceed with the data assessment.
- 2.6.4. *EDD MODIFICATIONS*: At no time shall the Subcontractor make modifications to an EDD unless instructed to do so by the CTR or their representative.

3. DOCUMENT TRANSFER

This section contains the requirements for the transfer of all documents to and from the Subcontractor for the purpose of data assessment. The term document refers to any hardcopy document or record involved in the data assessment process.

3.1. Custody Transfer Requirements

- 3.1.1. *CHAIN OF CUSTODY*: All documents shall be transferred to and from the Subcontractor's facility by chain of custody (COC). A COC or K-H log may be used for the custody transfer of documents.
- 3.1.2. *DOCUMENT INTEGRITY*: The Subcontractor shall be responsible for the integrity of all documents under their custody. This includes documents transferred to the Subcontractor for both onsite (RFETS) and offsite activities.

3.2. Shipping Requirements

- 3.2.1. *SHIPPING RESPONSIBILITY*: The Subcontractor is responsible for the transfer of documents to and from an offsite facility for data assessment. This responsibility includes all costs associated with document transfer.

4. REQUIREMENTS FOR OTHER DELIVERABLES

The following table summarizes other required deliverables in addition to the Data Assessment Record, and SDP Return.

TABLE B4 OTHER DELIVERABLES

Item	Schedule	Recipient (s)	Reference Exhibit/Section
Notification of Significant Data Quality Problems	Immediately upon identification	CTR	Exhibit A, Section 2
Monthly Report	Monthly	CTR	Exhibit B, Section 4
Organizational chart/diagram	14 days following an organizational change	CTR	Exhibit A, Section 4 Exhibit E, Section 3
Resume of Key Personnel and individuals performing data assessment	<ul style="list-style-type: none"> ▪ Prior to assigning new personnel to Key Positions or new personnel to Key Analytical Areas 	CTR	Exhibit A, Section 5
SDP Containing Missing Data	Returned to CTR if acceptable data is not obtained within 2 months of issuing a NCN	CTR	Exhibit B, Section 4
DQA Report Retention copy	maintained at the Subcontractor facility	N/A	Exhibit B, Section 4
CTR DQA Retention Report Resubmission requests	<ul style="list-style-type: none"> ▪ Hardcopy Requests: 2 calendar days of request ▪ DQA Report Electronic Copy : Within 4 hrs of request 	CTR	Exhibit B, Section 4
QA plan	<ul style="list-style-type: none"> ▪ Notification of QA Plan Revision ▪ Provided upon request 	CTR	Exhibit E, Section 3
QA Training Records	Available during audits and upon request	CTR	Exhibit E, Section 3
Audit corrective action response	As determined during audit debriefing	Lead Auditor	Exhibit E, Section 4
Standard operating procedures	<ul style="list-style-type: none"> ▪ Within 30 days of contract award ▪ Within 30 days after approval of new validation guidelines ▪ Prior to the implementation of new or amended SOPs ▪ Within 3 days of CTR request 	CTR	Exhibit F, Section 4

4.1. Monthly Report

The Subcontractor shall provide the CTR with a validation status report, due by the tenth day of each month. The monthly report shall include at a minimum, the following information for each SDP in the Subcontractor's possession during the previous calendar month:

- RIN
- Analytical Module (or first 3 Characters of the BOA Line Item Code)
- Lab
- Sample Count

- Turnaround Time Designator (e.g., 28d, 14d, etc.)
- SDP Received by Subcontractor
- Due Date as determined by Processing Code (calculated from date of DP receipt or from date of NCN resolution)
- NCN Issue Date
- NCN Resolution Date
- SDP Returned to K-H

An explanation for all the missed timelines shall be included in the report.

4.2. **Missing Data**

SDPs with missing data essential to performing a validation shall be retained by the Subcontractor for a period not to exceed two months following the issue of the NCN. SDPs that exceed the two month retention time shall be returned to K-H for disposition per the following requirements:

- 4.2.1. SDPs with missing data shall be returned separate from SDPs that have complete data assessment records.
- 4.2.2. Packaging containing SDPs with missing data shall be clearly labeled on the outside of packaging “SDP With Missing Data”.
- 4.2.3. A NCN shall accompany each SDP with a detailed explanation of what is missing. The NCN shall be inclusive of all missing data essential to the completion of a data assessment.

4.3. **CTR DQA Retention Report (Validation Only)**

The Subcontractor shall maintain copies of the CTR DQA Report Package at their facility for SDPs requiring Validation.

- 4.3.1. *CTR DQA RETENTION REPORT CONTENTS:* The CTR DQA Retention Report shall include a copy of the validation DQA report and all DQA Attachments as defined in Section 2 of this document.
- 4.3.2. *CTR DQA RETENTION REPORT REQUIREMENTS:* The CTR DQA Retention Report shall be maintained at the Subcontractor facility per document retention requirements provided in Exhibit F of this document.

4.4. **Resubmission Requirements**

The Subcontractor may be required to submit or resubmit data as a result of a CTR request, an incomplete deliverable, or an amendment to a previously submitted deliverable. Resubmissions fall under three category types as described below:

- ***Previously Submitted Deliverables:*** A resubmission of a deliverable without change from what was originally submitted (duplicate report).
- ***Additional Data:*** Submission of data to a previously submitted deliverable that was not included in the original submission.
- ***Revised Data:*** Submission of data that differ from the original submission.

4.4.1. *TURNAROU7ND REQUIREMENTS FOR RESUBMITTED DELIVERABLES*

The Subcontractor shall provide the CTR or their designee previously submitted hardcopy deliverables within 2 calendar days of request. The CTR shall be provided with an Electronic Copy of a DQA Report within 4 hours of the request.

4.4.2. *IDENTIFICATION OF RESUBMITTED DELIVERABLES*: Resubmissions shall be clearly marked to allow proper processing of the deliverables upon receipt. The identification requirements for the three resubmission categories are provided below for the identified deliverable types:

4.4.2.1. **Hardcopy DQA Report**: Resubmissions of the hardcopy DQA report shall be transmitted in its entirety (no single pages).

4.4.2.2. **Hardcopy DQA Report Attachments**: Only applicable pages of the Hardcopy DQA Report Attachments, validation worksheet, NCN, or EDD Record need to be included in the resubmission.

4.4.2.3. **Electronic DQA Report**: Resubmission of the Electronic DQA Report shall be transmitted in its entirety (no single pages). Whenever the hardcopy DQA Report is revised, a corresponding Electronic DQA Report shall also be submitted.

4.4.2.4. **Identifying Resubmitted Deliverables**

Hardcopy Resubmissions: A cover page shall accompany the resubmittal of all hardcopy resubmittals. The cover page shall contain the following information:

Cover Page: A cover page shall be the first page of the resubmittal and shall contain the following:

- The first line of the cover page shall state: “**Duplicate Report**”, for previously submitted deliverables, or “**Revised Report**” for deliverables containing Additional or Revised data followed by a dash and a sequential two digit Resubmittal number (e.g., Revised Report – 01). The resubmittal number shall correspond to the number provided in the DQA Electronic Report file name.
- The Report Identification Number (RIN)
- The three character alpha prefix of the Line Item Code(RIN)
- Date of the resubmittal
- A description of what changed

Affected Pages: The top right corner of all pages containing new or revised information shall be marked with “**Revised**” followed by the date of resubmittal.

File Name: The following designations shall be appended to the end of the pdf file name for Resubmitted Deliverables:

_DUP for Previously Submitted Deliverables.

_REVxx for Additional or Revised Data.

where

xx = a two-digit number identifying the number of resubmissions beginning with 01.

5. INVOICING

The CTR Invoice copy shall be contained in an Excel file that is transmitted to the CTR by email. The CTR Invoice shall include, at a minimum, the following information organized by task:

5.1. Data Verification/Validation

At a minimum, the following information shall be provided in a tabular format for all verifications/validations performed. Data assessment types (Validation, Verification) shall be tabulated separately.

- DQA REPORT DATE/LOG DATE
- ROCKY FLATS VALIDATION TRACKING NUMBER (RF # for Validation only)
- REPORT IDENTIFICATION NUMBER (RIN)
- LABORATORY SDG NUMBER
- LABORATORY NAME
- LABORATORY LINE ITEM CODE(S): The Line Item Code(s) from the COC.
- DATA ASSESSMENT LINE ITEM CODE (DA-LIC)
- NUMBER OF SAMPLES IN RIN
- SURCHARGE DESIGNATOR(S): (28d, 28dmm, 14d, 14dmm, etc., where d = day, and mm = mixed matrix)
- UNIT COST per verification/validation
- NAME OF DATA ASSESSOR

5.1.1. *VERIFICATIONS ELEVATED TO VALIDATION*: When the Subcontractor elevates a verification to a validation, the Subcontractor shall invoice for a validation only.

5.1.2. *RINs RETURNED FOR MISSING DATA*: The Subcontractor shall identify on the invoice all RINs returned for missing data.

5.2. Non-Compliance Notifications (NCNs)

All NCNs, originated by the Subcontractor, shall be listed with the following information:

- *DATE ISSUED*
- *REPORT IDENTIFICATION NUMBER (RIN)*
- *NCN NUMBER*
- *LABORATORY LINE ITEM CODE(S)*
- *UNIT COST* per NCN

5.3. Rebilling

The Subcontractor shall include a Rebilling Section on the invoice for resubmitting disallowed items from previous invoices after problems have been resolved. All invoice required information for a verification, validation or NCN shall be provided in this section.

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EXHIBIT C: DATA ASSESSMENT SERVICES LINE ITEM CODES

1. LINE ITEM CODES

The Data Assessment Line Item Codes (DA-LIC) contained in Table C1 associate data assessment to target Analyte lists, methods, or specific analytical parameters. LICs are used to request data assessment services and to identify the specific data assessment service performed during the billing process.

TABLE C1 DATA ASSESSMENT LINE ITEM CODES

DA-LIC	SDP Content Description
AS03C101	VOA- All Matrices - Full List
AS03C102	VOA- All Matrices - Single Compound
AS03C103	RETIRED
AS03C104	RETIRED
AS03C105	VOA-All Matrices- Extended List ^{1,2}
AS03C106	SVOA-All Matrices-Full List
AS03C107	SVOA-All Matrices-Single Compound
AS03C108	PEST/PCB/HERB-All Matrices
AS03C109	PCB Only- All Matrices
AS03C110	Dioxin/Furan-All Matrices
AS03C111	Metals-All Matrices-Full List ^{1,3}
AS03C112	Metals-All Matrices 1 to 4 Metals ^{1,4}
AS03C113	Any 1 WCH/MIS Parameter-All Matrices
AS03C114	2-3 WCH/MIS Parameters-All Matrices
AS03C115	4-6 WCH/MIS Parameters-All Matrices
AS03C116	7-10 WCH/MIS Parameters-All Matrices
AS03C117	Full UTS List (Metals & Organics)-All Matrices
AS03C118	Any 1 Alpha Spec Parameter-All Matrices
AS03C119	Any 2 Alpha Spec Parameters-All Matrices
AS03C120	Any 3 Alpha Spec Parameters-All Matrices
AS03C121	Any 4 Alpha Spec Parameters-All Matrices
AS03C122	LSC Parameter- All Matrices
AS03C123	GPC Parameter-All Matrices
AS03C124	Gamma-All Matrices-Full List
AS03C125	Gamma-All Matrices-Short List
AS03C126	Retired
AS03C150	GRRASP: Rads & WQP
AS03C151	GRRASP: Organics

TABLE C1 DATA ASSESSMENT LINE ITEM CODES (continued)

DA-LIC	SDP Content Description
AS03C152	GRRASP: Metals
AS03C153	Analytical Measurements: Rads & WQP
AS03C154	Analytical Measurements: Organics
AS03C155	Analytical Measurements: Metals

1.1. DA-LIC Unit Pricing

Pricing for each DA-LICs shall reflect all cost associated with performing a data assessment on a single SDP to include direct and indirect costs, fee/profit, the CTR DQA Report Package, the Laboratory DQA Report, the application of data qualifiers and reason codes, the electronic deliverables, document transfers, etc.

Prices shall be based on the type of data assessment performed (verification or validation), the turnaround time for completing the data assessment (28 days for validation and 7 days for verification) and the SDP size (number of samples in the SDP).

1.1.1. *NUMBER OF SAMPLES*: For each DA-LIC, the Subcontractor shall provide a price for three different SDP sizes. The three SDP sizes are Small (1 to 5 samples); Medium (6 to 10 Samples); and Large (11 to 20 Samples).

1.1.1.1. **SDPs containing > 20 Samples**: For billing purposes, SDPs containing more than 20 samples may be billed multiple times under the same RIN and DA-LIC. For SDPs containing greater than 20 samples, the least number of separate billings for the same RIN and DA-LIC shall be invoiced. For example, a SDP containing 21 samples would be billed twice under the same RIN, one Large SDP and one Small SDG. It would not be billable as three Medium SDPs.

1.1.2. *SURCHARGE MULTIPLIERS*: The Subcontractor shall provide two sets of Surcharge multipliers.

- The first set shall be a percent multiplier for each Turnaround Time Designator applicable to the data assessment level. This multiplier shall address the cost associated with expedited data assessment requests.

Note: Because unit pricing is based on a 28-day validation and a 7-day verification, the multipliers for these two processing times would both be 100%.

- The second set shall be a percent multiplier for each Turnaround Time Designator that includes both the cost associated with turnaround time and the cost associated with SDPs with two or more analytical batch because field QC created a mixed matrix within the RIN.

Note: Because unit pricing is based on a 28-day validation and a 7-day verification, the multipliers for these two processing times would only address the cost associated with a SDP containing a mixed matrix because of field QC.

1.2. **VOA Extended List**

The "VOA Extended List" addresses SDPs containing the Appendix IX list of VOC or a SDP that contains the 8260 list with additional compounds. The latter situation would involve two or more Laboratory LICs in the same SDP and the possibility for more than one analytical batch.

1.3. **Metal SDP with Multiple Laboratory LICs**

Metal SDPs containing multiple Laboratory LICs shall be billed only under one DA-LIC, e.g., a SDP containing 5 samples analyzed for a full metal suite, and 3 samples analyzed for only a single metal, shall be billed under AS03C111 for 8 samples.

1.4. **Metal SDP Containing One to Four Elements**

Metal SDPs containing up to four single element Laboratory LICs or two Two-Metal Laboratory LIC shall be billed under AS03C112. Any Metal SDP containing more than 4 metals, regardless of the number of Laboratory LICs, shall be billed under AS03C111.

1.5. **DA-LICs Based on Number of Parameters**

DA-LICs AS03C113 through AS03C116 and AS03C118 through AS03C121 depend on the number of parameters and the number of samples in a SDP. For these LICs, sample counts shall be based on the number of Sample Events (RIN.EEE, where RIN is the RIN number and EEE is a sequential 3-digit Event Number) within a given RIN. The Site Sample Bottle Number (RIN.EEE.BBB, where BBB is the sequential Bottle Identification number for a given RIN and Event Number) identifies the specific container collected for an event and should not be used to determine sample count. Typically, multiple parameters will be requested for a particular sampling event. Of those parameters requested, several may be analyzed from a single bottle, other parameters may require an individual bottle and some parameters may require multiple bottles to meet sample volume requirements of the determination being performed.

1.5.1. ***SELECTING PARAMETER-BASED DA-LICs***: Parameter-based DA-LICs shall be selected according to the total number of unique parameters contained in a given SDP. The number of unique parameters is independent of the distribution of the parameters among sampling events within a given RIN. For example, if a SDP contains TOC, BOD5, and Nitrate for Sample Event 1 and Phosphate, Total Cyanide, TOC and Nitrate for Sample Event 2, the total number of parameters for this SDP would be five (Total Unique parameters = TOC, BOD5, Nitrate, Phosphate, Total Cyanide).

1.5.1.1. **Anions Determined By Ion Chromatography**

Within a single SDP, two or more anions determined by ion chromatography shall be counted as two Parameters when determining the proper DA-LIC.

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EXHIBIT D: DATA ASSESSMENT GUIDELINES

1. INTRODUCTION

This Exhibit contains a list of the current data assessment guidelines for performing Verification and Validation. Table D1 correlates the Key Analytical Areas referenced in Exhibit A, Section 5 to these documents.

2. DATA ASSESSMENT GUIDELINES AND KEY ANALYTICAL AREAS

The data assessment guidelines provided in Table D1 are to be used in the data assessment process for both verification and validation.

TABLE D1 DATA ASSESSMENT GUIDELINES AND KEY ANALYTICAL AREAS

Key Analytical Areas	Verification and Validation Guidelines Document Identifier
General Guidelines for Data Verification and Validation (Applicable to all Key Analytical Areas)	DA-GR01
Volatile Organics	DA-SS01
Semivolatile Organics	DA-SS02
PCB/Pesticides	DA-SS03
Inorganic Metals	DA-SS05
Wet Chemistry Parameters	DA-SS06
Isotopic Determinations by Alpha Spectrometry	DA-RC01
Tritium Analysis by Liquid Scintillation Counting	DA-RC02
Gross Alpha and Gross Beta Analysis by GPC	DA-RC04
Radiometric Strontium by GPC	DA-RC05
Gamma Spectroscopy	DA-GAM

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EXHIBIT E: QUALITY ASSURANCE REQUIREMENTS

1. INTRODUCTION

This Exhibit outlines minimum quality assurance requirements for subcontracted data assessment services. Work performed under this SOW is governed by the Subcontractor's Quality Assurance Program Requirements that address the elements of ASME NQA-1 (latest edition), ANSI/ASQC E4 (latest edition), and DOE Order 414.1A. The Subcontractor shall comply with the following specific Quality Assurance (QA) requirements prior to the initiation of work, as appropriate:

2. QUALITY ASSURANCE PROGRAM

The Subcontractor shall establish a QA Program with the objective of providing sound data quality assessment. This program shall incorporate a QA Plan, QC procedures, corrective action systems, and documentation required during the data assessment process. QA Program requirements include but are not limited to the following:

- Development and implementation of a QA Program through a written QA Plan
- Preparation of and adherence to written SOPs
- Adherence to K-H approved Data Assessment Guidelines
- Submission of all original documentation generated during the data assessment process

3. QUALITY ASSURANCE PLANS

3.1. Schedules

The Subcontractor shall implement and maintain a Subcontractor approved QA Plan, that presents the policies, organization, objectives, and specific QA activities designed to achieve the quality requirements of this SOW. The Subcontractor shall notify the CTR of revisions to the QA plan within 14 days of its effective date. A copy of the revised QA Plan shall be provided to the CTR upon request.

3.2. QA Plan Review

The QA Plan shall be routinely reviewed by the Subcontractor's management staff to assure adequacy and to develop and maintain a system to promote continuous quality improvement.

3.3. QA Training

Personnel performing technical work shall receive training and indoctrination to assure proper understanding of the QA and technical requirements of this SOW before beginning work. In addition, written personnel qualification requirements shall be established for all positions performing technical work. Documentation of training, whether specific or general, shall be maintained by the Subcontractor and be available during onsite inspections and upon CTR request.

3.4. **QA Plan Key Elements**

The QA Plan shall address all key elements listed below. Where procedures are indicated, the QA Plan shall include these procedures in text or by reference.

- 3.4.1. *ORGANIZATION*: The authority and responsibilities of persons or organizations performing work under this SOW shall be established, documented and submitted to CTR or their representative. An organization chart identifying specific individuals by name, supported by itemized authorities and responsibilities is a suitable means of documentation.
- 3.4.2. *INSTRUCTIONS, PROCEDURES, AND DRAWINGS*: All work shall be performed to Subcontractor-approved and controlled procedures except where excluded in writing by K-H. The Subcontractor shall develop standard operating procedures to be used during the data assessment process.
- 3.4.3. *DOCUMENT CONTROL*: The Subcontractor shall acknowledge receipt of and manage K-H data assessment guidelines, procedures, and other documents provided by K-H in accordance with Subcontractor approved procedures. Exhibit F contains specific requirements for Subcontractor to adhere to during the performance of this SOW.
- 3.4.4. *CONTROL OF NONCONFORMING ITEMS*: Activities regarding the identification and disposition of nonconforming items shall be performed in accordance with Subcontractor approved procedure(s). The control of nonconforming items shall apply to all activities that involve the handling of all items, including data, hardware, and software.
- 3.4.5. *CORRECTIVE ACTIONS*: Activities that identify, rectify and preclude recurrence of conditions adverse to quality shall be conducted in accordance with Subcontractor approved procedure(s).
- 3.4.6. *CHAIN-OF-CUSTODY*: Activities that involve the handling, transfer and control of the SDP, Data Assessment Record, and the Electronic Data Deliverable shall be conducted in accordance with Subcontractor approved procedure(s). These procedure(s) shall address the following:
 - 3.4.6.1. Custody requirements for the transfer of documents between K-H and Subcontractor.
 - 3.4.6.2. The protection of documents, data, and related information while in the possession of the Subcontractor from accidental damage, theft, or malicious mischief.
 - 3.4.6.3. Confidentiality of document contents.
- 3.4.7. *SOFTWARE QUALITY ASSURANCE*: The Subcontractor shall have procedure(s) that ensure computer programs used to generate or upload data are validated, verified, and documented for both vendor-supplied and in-house software packages. These procedure(s) shall incorporate the "Computer Hardware and Software" requirements from ANSI/ANQC E4-1994. This program shall include the following minimum requirements:

- 3.4.7.1. Software validation shall occur before initial use and following subsequent revisions.
 - 3.4.7.2. A correlation between the validation documentation and the software shall be established.
 - 3.4.7.3. A historical file of software revisions and associated validation documentation shall be maintained. The historical file shall be maintained in chronological order.
 - 3.4.7.4. Computer programs and data on electronic media shall be handled, stored, safeguarded, and controlled to prevent damage and deterioration.
- 3.4.8. *DATA MANAGEMENT*: The Subcontractor shall have written procedure(s) for the entry of data for the purpose of calculation verification, report generation, and the entry of data qualifiers and reason codes to the EDD.

4. SUBCONTRACTOR EVALUATIONS

Activities affecting quality are subject to inspection/audit by K-H. K-H activities do not relieve the Subcontractor of responsibility for verification of quality achievement.

4.1. Audit Types

The Subcontractor may be subject to two types of audits: routine, and follow-up.

4.1.1. Routine: A routine audit is a comprehensive audit performed to verify adherence to and effectiveness of QA requirements. The Subcontractor shall be subject to routine audits at their facility not more than two times per calendar year during performance of this SOW.

4.1.2. Follow-up: A follow-up audit verifies that adequate corrective action has been implemented by the Subcontractor in response to a previous audit.

4.2. Schedules and Notifications

Facility inspections/audits for the purpose of identifying and resolving deficiencies or verifying corrective actions may be performed at any time during performance of the Subcontract. Unannounced and announced inspections/audits may be performed at any time during the Subcontract period of performance; written notification shall be provided to the Subcontractor for announced inspections/audits.

4.3. Right of Access

K-H shall have rights of access to the Subcontractor's and any sub-tier supplier's facilities and records during normal working hours for inspection or audit by K-H, their designated representative, and/or other parties authorized by K-H. This unfettered access shall include, but not be limited to the right to audit material, test, inspection, services, and quality records; make surveillance visits during the life of the Subcontract; and witness tests to the extent K-H deems necessary to assure that work is being performed in accordance with this Subcontract.

4.4. Corrective Action Reports in Response to Audit Reports

Following a facility evaluation, the audit team will conduct an audit closing conference with the Subcontractor's staff to discuss identified deficiencies and to establish a schedule for the Subcontractor to submit a corrective action plan. The corrective action plan shall address actions and timelines for the resolution of the identified deficiencies.

5. PERFORMANCE CRITERIA

Subcontract performance will be continually assessed by the CTR. Compliance to include all areas of the Subcontract, with particular emphasis on delivery schedules, Data Quality Assessment Report completeness, and accuracy in the application of data qualifiers and reason codes to the EDD is expected.

EXHIBIT F: EVIDENTIARY REQUIREMENTS

1. INTRODUCTION

This Exhibit describes the evidentiary requirements that shall be followed for document control, document maintenance, document integrity, document storage, document retention, and procedure development requirements.

2. DOCUMENT CONTROL REQUIREMENTS

The goal of the Subcontractor document control program is to assure that all K-H and Subcontractor documents associated with this SOW will be accounted for throughout the Subcontractor performance period. Accountable documents used by the Subcontractor shall include (but not be limited to) all applicable Subcontractor procedures, and K-H data assessment guidelines, procedures, and other applicable documents

2.1. Document Control System

A document control system shall be established by the Subcontractor to preclude the use of outdated or inappropriate procedures or documents. This system shall insure that outdated or uncontrolled procedures are not in the possession of Subcontractor personnel for use in the data assessment process under this SOW.

2.2. Subcontractor Documents and Procedures

2.2.1. *DOCUMENT CONTROL*: A document control process shall be established to identify the title, unique Standard Operating Procedure (SOP) identifier, current revision, custodian, and copy number of all SOPs.

2.2.2. *PERIODIC SOP REVIEW*: Procedures and/or documents shall be reviewed periodically and updated as necessary when Subcontract modifications are made. [All procedure/document reviews shall be documented.](#)

2.2.3. *DOCUMENT RETENTION*: Current procedures and superseded revisions of procedures shall be retained as accountable documents by the Subcontractor as described in Exhibit F, Section 3.

2.2.4. *DOCUMENT AVAILABILITY*: Procedures and documents shall be available during onsite evaluations. A complete set of procedures shall be available for inspection at such evaluations.

3. DOCUMENT INTEGRITY

3.1. Error Correction

Corrections and updates to documents (i.e., validation worksheets, addition of data qualifiers and reason codes to Data Summary Forms, etc.) shall be performed in a manner that preserves record integrity. The following procedures must be followed when correcting errors:

- 3.1.1. A single line shall be drawn through the error and the correct information recorded in black ink.
- 3.1.2. No information shall be obliterated or made unreadable.
- 3.1.3. All corrections, additions, and crossed out information shall be initialed and dated in black ink.
- 3.1.4. Use of correction fluid is prohibited.

3.2. Corrections And Updates To Submitted Deliverables

Changes to previously submitted deliverables resulting from errors or amendments shall be documented to allow traceability of updates. Documentation shall include the following for each change and shall accompany the resubmitted deliverable:

- 3.2.1. Justification or rationale for the change.
- 3.2.2. Name and Initials of the person making the change or changes.
- 3.2.3. Change documentation shall be retained according to the schedule of the original deliverable.
- 3.2.4. Resubmitted deliverables shall be reevaluated as a part of the Subcontractor's internal inspection process prior to resubmission. The entire deliverable, not just the changes, shall be inspected.
- 3.2.5. The Project Manager shall approve changes to originally submitted deliverables.
- 3.2.6. Resubmission of amended deliverables shall meet the delivery requirements of Exhibit B, Section 4.
- 3.2.7. Documentation of changes made to previously submitted deliverables may be requested during audits.

3.3. Storage of RFETS Documents

- 3.3.1. The Subcontractor shall maintain RFETS documents in a secure location that is protected from damage and deterioration.
- 3.3.2. The Subcontractor shall maintain written records and documents to be used as evidence for data assessment activities. Documents and records maintained by the Subcontractor shall be legible, identifiable, and retrievable.

3.4. Document Retention

Documentation and records maintained by the Subcontractor shall be retained at the Subcontractor facility for a period of five calendar years from the time of generation. After the 5-year retention period or at the time the Subcontract concludes, records may be disposed of with the following provisions:

- 3.4.1. *DOCUMENTS RETAINED FOR FIVE CALENDAR YEARS*: Six months prior to the date the Subcontractor intends to dispose of documentation and records related to RFETS data assessment, the Subcontractor shall notify the CTR or designated representative in writing. Documentation and records shall not be disposed without written approval from the CTR.
- 3.4.2. *CONTRACT CLOSURE*: Subcontractor shall notify the CTR or designated representative in writing of all K-H related documents in their possession . Documentation and records shall not be disposed without written approval from the CTR.
- 3.4.3. RFETS retains the right to request physical reproduction of the documentation and records by the Subcontractor at any time during the retention period.

4. STANDARD OPERATING PROCEDURES

A Standard Operating Procedure (SOP) is a written document that provides step-by-step directions or requirements for performance of certain tasks. These procedures are necessary to ensure that data assessment activities produced under this SOW are acceptable. The following table identifies the minimum activities that shall be addressed in SOPs.

TABLE F1 REQUIRED STANDARD OPERATING PROCEDURES

SOP Description	Reference (Exhibit, Section)
Data Assessment Procedure(s)	Exhibit F, Section 4
Document Control	Exhibit E, Section 3 Exhibit F, Section 2
Control of Nonconforming Items	Exhibit E, Section 3
Corrective Actions	Exhibit E, Section 3
Chain of Custody	Exhibit E, Section 3
Software Quality Assurance	Exhibit E, Section 3
Data Management	Exhibit E, Section 3

4.1. SOP Delivery Requirements

4.1.1. The Subcontractor shall develop standard operating procedures to be used during the data assessment process. These procedures shall be submitted to the CTR or their designee for review and approval.

- 4.1.1.1. SOPs used in the Data Assessment process shall be submitted to CTR for review and approval per the following schedule:
 - within 30 days of subcontract award
 - prior to the implementation of new or amended SOP(s)

- 4.1.1.2. At a minimum, the SOPs listed in Table F1 shall be included in the submittal.
- 4.1.1.3. The CTR may request a copy of an SOP at any time. The Subcontractor shall deliver SOP copies to the CTR within three calendar days after a request is received.

EXHIBIT G: GLOSSARY OF TERMS AND ACRONYMS

1. INTRODUCTION

The glossary of terms and acronyms in this Exhibit ensures the proper understanding of language used in this SOW. These terms are used throughout the PSA Modules contained in the SOW for Analytical Measurements, and PSA Module Data Assessment Guidelines.

2. GLOSSARY OF TERMS

ACTINIDE SERIES: The series of elements beginning with actinium, element number 89, and continuing through lawrencium, element number 103.

ALIQOT: A measured portion of a field sample or working standard taken for analysis.

ALPHA DECAY - The spontaneous emission of an alpha particle during radioactive decay of a nucleus. An alpha particle is a strongly ionizing particle from the nucleus having a mass and charge equal to that of a helium nucleus (2 protons and 2 neutrons).

ANALYSIS DATA SHEET: A form used to tabulate and report sample analysis results for target analytes. In CLP-SOW reporting protocols, this form is usually designated as *Form 1*. For non-CLP methods, the Analysis Data Sheet should contain, at a minimum, the following information: Site sample numbers and Laboratory sample identifiers, measured concentrations with units for all requested analytes, and necessary comments. Quality control and concentration qualifiers shall also be included when appropriate.

ANALYSIS DATE/TIME: The date and military time (24-hour clock) of the initiation of counting of a sample, standard, or blank in a radioactive counting system.

ANALYSIS RUN: The actual instrumental analysis of the sample preparations, from the time of instrumental calibration through the running of the final check.

ANALYTE: The specific component measured in a chemical analysis; the parameter/isotope of interest.

ANALYTICAL BATCH: A set of samples analyzed together as a unit for the purpose of method QA/QC. An analytical batch may contain several RINs. It is also possible that several analytical batches could comprise a single RIN. Each analytical batch shall have a unique identifier that associates client and QC samples within the batch.

ANALYTICAL PREPARATION METHOD: - A method (digestion, dilution, extraction, fusion, etc.) used to dissolve or otherwise release the analyte(s) of interest from its matrix and provide a final substrate or solution containing the analyte in a form which is suitable for instrumental or other analysis methods.

ANALYTICAL SAMPLE: A substance or sample submitted from an outside entity to the laboratory for analysis.

ASTM TYPE I WATER: Reagent water with a conductivity of less than 0.1 $\mu\text{mho/cm}$ at 25° C and has been polished with a 0.45 μm membrane filter. For additional specifications, refer to ASTM D1193-77, "Standard Specification for Reagent Water."

ASTM TYPE II WATER: Deionized water with a conductivity of less than 1.0 $\mu\text{mho/cm}$ at 25° C. For additional specifications, refer to ASTM D1193-77, "Standard Specification for Reagent Water."

BACKGROUND CORRECTION: A technique for measuring background (non-analyte) contribution to the instrument signal and performing mathematical compensation for the resulting error. In radiochemical

analysis, correction for the background contribution in the determination of radionuclides for a specific detector.

BETA DECAY: The emission of a beta particle during radioactive decay of a nucleus. A beta particle is a charged particle emitted from the nucleus, having a mass and charge equal in magnitude to that of an electron.

BLIND SAMPLE: A surrogate sample containing known amounts of analyte(s) of interest, submitted as an audit sample.

BOTTLE IDENTIFICATION NUMBER: A unique identifying number assigned to each sample container associated within a RIN and Sample Event. This number begins at '001' and increases sequentially until the event changes.

CALIBRATION: The establishment of an analytical curve relating the response of an instrument to a quantifiable characteristic of the analyte in known standards.

CALIBRATION STANDARDS: A series of known standard solutions used by the analyst for calibration of the instrument (i.e., preparation of the analytical curve).

CHEMICAL YIELD: The yield determined by a physical or radiochemical measurement of the recovered carrier or tracer.

COEFFICIENT OF VARIATION (CV): The standard deviation as a percent of the arithmetic mean.

CONTRACTOR TECHNICAL REPRESENTATIVE (CTR): Person responsible for providing technical oversight of the subcontract.

CONTROL LIMITS: A range within which specified measurements results must fall to be compliant. Control limits may be mandatory, requiring corrective action if exceeded, or advisory, requiring that noncompliant data be flagged.

CORRELATION COEFFICIENT: A number (r) which indicates the degree of dependence between two variables (i.e., concentration - activity).

COUNTING EFFICIENCY: The ratio of the net count rate of a radionuclide standard source to its corresponding known activity.

COUNTING EFFICIENCY FACTOR: The fraction of actual disintegrations in the sample which are counted by the detector as a function of residue weight.

CURIES: The traditional unit used to express the activity (amount) of radioactive material. The SI unit for activity is the becquerel.

1 curie (Ci)	=	2.22×10^{12} disintegration/minute
1 millicurie (mCi)	=	2.22×10^9 disintegration/minute
1 microcurie (μ ci)	=	2.22×10^6 disintegration/minute
1 picocurie (pCi)	=	2.22 disintegration/minute
1 becquerel (Bq)	=	1 disintegration/second

CUSTODY SEAL: Adhesive seal applied to sample bottles to maintain Chain of Custody until sample is delivered to the laboratory.

DATA QUALITY ASSESSMENT REPORT: A report that describes the results of a verification or a validation for data quality and laboratory adherence to SOW requirements.

DAUGHTER: A nuclide formed by radioactive decay of a parent radionuclide.

DAY: Unless otherwise specified, day shall mean calendar day. There are 365.25 days per year.

DETECTION LIMIT: A stated limiting value which designates the lowest concentration that can be estimated or determined with confidence and that is specific to the analytical procedure used.

DISSOLVED: The concentration of an analyte determined on a sample which has been filtered in the field prior to preservation. Protocols for sample pretreatment for dissolved analytes are specific to analyte and procedure source.

DISSOLVED SOLIDS: Radionuclide isotopes and other solid materials which have not been digested prior to analysis and which will pass through a 0.45 µm filter.

DRY WEIGHT: The weight of a sample based on percent solids. The weight after drying in an oven at 103-105 C until a constant weight is obtained.

DUPLICATE SAMPLE: A second aliquot of a sample that serves as a Batch QC Sample, demonstrating analytical method precision and sample homogeneity.

EFFICIENCY: A measure of the fraction of actual disintegrations in the sample which are counted by a detector.

ENERGY CALIBRATION: The correlation of the multichannel analyzer (MCA) channel number to decay energy, obtained from the location of peaks from known radioactive standards..

ERROR: An estimation of the analytical measurement uncertainty, expressed as an error term with a specific analytical result, or as a typical value for a specific analytical technique.

ESTIMATED QUANTITATION LIMIT (EQL): Also known as the Practical Quantitation Limit (PQL). The lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. The EQL is a multiple of Method Detection Limit (MDL) and is highly dependent on sample matrices and analysis method.

FIELD BLANK: A sample prepared in the field by transferring ASTM Type II Water to a clean sample container. The field blank is used to indicate the presence of contamination due to sample collection and handling.

FIELD SAMPLE: A portion of material received to be analyzed that is contained in single or multiple containers and identified by a unique Site sample number.

GAMMA RADIATION: Electromagnetic radiation of nuclear origin usually accompanying another form of radioactive decay.

HALF-LIFE (T_{1/2}): The time required for 50 percent of a radioactive isotope to decay.

HIGH LEVEL: A decision level for purposes of segregation for gross alpha activities known or suspected to be greater than approximately 20 dpm per aliquot

HOLDING TIME: The elapsed time expressed in days from the date of sampling until the date of analysis for which sample data will be considered valid.

Holding time = (sample analysis date - sampling date)

INDEPENDENT STANDARD: A standard solution that is composed of analytes from a different source than those making up the standard used for the initial calibration.

INSPECTION PERIOD: This is the period from the day after the receipt of data until the day the laboratory receives notification of the nonconformities or acceptance of the data.

IN-HOUSE: At the laboratory facility which is identified in the subcontract.

INSTRUMENT DETECTION LIMIT (IDL): Exact definitions are method-specific; however, these definitions usually involve estimating the analyte concentration or activity which creates the smallest signal above the background noise that an instrument can detect reliably.

INTERFERENTS: Undesired substances that affect quantification of the parameter of interest.

INTERNAL DOSIMETRY: The Internal Dosimetry Department of the Rocky Flats Radiological Health Section of the Radiological Control Program.

INTERNAL STANDARD: A material present in or added to samples that serves as an intensity reference for spectral measurements.

IONIZING RADIATION: Any electromagnetic or particulate radiation capable of producing ions directly or indirectly in its passage through matter.

ISOTOPES: Elements which contain the same number of protons, but a different number of neutrons in the nucleus.

LABORATORY CONTROL SAMPLE (LCS): A QC sample (control) of known analyte value. Laboratory control samples are analyzed using the same sample preparation, reagents, and analytical methods employed for the Client samples processed as part of the Analytical Batch.

LABORATORY RECEIPT DATE: The date on which a sample is received at the laboratory facility, as recorded on the shipper's delivery receipt. Also referred to as VTSR (validated time of sample receipt).

LINE ITEM CODE: This code, included on the COC or other documentation received with samples, designates the analyte prescription.

MATRIX: The predominant material of which the sample to be analyzed is composed. For the purpose of this SOW, a sample matrix is either water, soil/sediment, or waste. Matrix is not synonymous with phase (liquid or solid).

MATRIX BLANK: Synthetic sample containing no measurable amount of analyte being assessed.

MATRIX SPIKE: An aliquot of a sample fortified with known quantities of specific parameters and subjected to the entire analytical procedure in order to judge the appropriateness of the method for the matrix by measuring recovery.

METHOD DETECTION LIMIT (MDL): For organic and inorganic analyses, the MDL is defined as the minimum concentration of an analyte that can be determined with 99% confidence that the true value is greater than zero. Instructions for the determination of MDL are usually provided by, and specific to, the method of analysis.

In radiochemical analyses, the MDL is defined as the minimum activity (concentration) of an analyte (radioisotope) that can be determined with 95% confidence that true value is greater than zero, provided by and specified to the sample type and method of analysis. In radiochemistry, the MDL considers not only the instrument characteristics, but all other factors and conditions (i.e., sample size and sample type) that influence the measurements.

MINIMUM DETECTABLE ACTIVITY (MDA): An estimate of the level of the smallest activity that can be detected in a sample with a 95% confidence level. The MDA considers not only the instrument characteristics, but all other factors and conditions, such as sample size and matrix, which affect the analysis.

MINIMUM DETECTABLE AMOUNT (MDA): The smallest amount of a radionuclide which will be detected with an b probability of non-detection of 0.05 while accepting an a probability of 0.05 for falsely detecting the activity in a matrix sample.

MIXED WASTE: Waste containing both radioactive and hazardous components as defined by the Atomic Energy Act and the Resource Conservation Recovery Act respectively.

NEAT STANDARD: A pure original analyte obtained from a chemical supply house.

NIST-TRACEABLE STANDARD: A Standard Reference Material (SRM) purchased either directly from the National Institute of Standards and Technology (NIST) or the other approved vendors who provide the traceability certificate to the NIST.

NUCLIDE: An atomic species characterized by the constitution of its nucleus, specifically by the number of protons and neutrons.

PRACTICAL QUANTITATION LIMIT (PQL): Synonymous with Estimated Quantitation Limit.

PERCENT SOLIDS: The proportion of solid in a sample determined by drying an aliquot of the sample.

PREPARATION BATCH: A group of samples prepared at the same time in the same location using the same method.

PREPARATION BLANK (reagent blank, method blank): An analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The preparation blank should be carried through the complete sample preparation and analytical procedure and is used to assess contamination resulting from the entire analytical process.

PROTOCOL: A compilation of the procedure to be followed with respect to sample receipt and handling, analytical methods, data reporting and deliverables, and document control. Used synonymously with the Statement of Work (SOW).

QC SAMPLE: For a batch of samples for radiochemical analysis, these are the Preparation Blank, the Duplicate Sample and the Laboratory Control Sample. For other analysis methods, QC samples typically include the following when required by the PSA Modules: preparation blanks, laboratory duplicate samples, spiked samples, spiked duplicates, and laboratory control samples.

RADIOACTIVE DECAY: The process by which a spontaneous change in nuclear state takes place. This process is accompanied by the emission of energy and subatomic particles.

RADIOACTIVE WASTE: Solid, liquid, or gaseous materials containing radionuclides regulated under the Atomic Energy Act of 1954 as amended, and of negligible economic value considering recovery costs.

RADIATION YIELD: The amount of radiation of the type being measured that is produced per each disintegration which occurs. For gamma spectrometry, this is commonly called gamma abundance.

REGION OF INTEREST (ROI): In radiochemical analysis, the Multichannel Analyzer region defining the isotope of interest displayed in terms of energy or channels.

REPORT IDENTIFICATION NUMBER (RIN): A grouping of samples identified by the CTR to be included in a single SDP for a given analytical specific area, e.g., VOAs, SVOAs, Metals, Wet Chemistry, etc. A RIN may be comprised of more than one analytical batch, in which case, each analytical batch shall have a unique identifier that associates client and QC samples within the batch. Conversely, if two or more RINs are combined into one analytical batch, each RIN data package must contain all required QC results. RINs are formatted as YY*NNNN, where YY is the 2-digit designator for the Federal fiscal year in which the RIN was assigned, * is an internal letter designator, and NNNN designates a four-digit number.

RESOLUTION PERIOD: The time allowed for the correction of non-compliant SDP or response to a Client's question.

REQUIRED DETECTION LIMITS (RDL): The minimum detection level acceptable for analyses performed under this contract.

ROUNDING RULES: If the number following those to be retained is less than five, the number is dropped, and the retained numbers are kept unchanged. As an example, 11.443 is rounded off to 11.44. If the number following those to be retained is five and if there are no numbers other than zeros beyond the five, the number is dropped, and the last place number retained is increased by one if it is an odd number or it is kept unchanged if an even number. As an example, 11.435 is rounded off to 11.44 while 11.425 is rounded off to 11.42. If the

number following those to be retained is greater than five, the number is dropped, and the last place number retained is increased by one. If a series of multiple operations is to be performed (add, subtract, divide, multiply), all numbers are carried through the calculations. Then the final answer is rounded to the proper number of significant figures.

SAMPLE DATA PACKAGE (SDP): A deliverable that includes data from analysis of all samples in one RIN for a specific analytical area, e.g., VOA, SVOA, Metals, etc., including analytical and field samples, PE sample, sample reanalyses, blanks, spikes, duplicates, and LCSs.

SAMPLE DATA PACKAGE NARRATIVE: The section of the SDP describing all problems or unusual circumstances encountered in the analytical processing of the sample. The narrative should include descriptions of matrix interferences, dilutions required, explanations of any Quality Control deficiencies, method modifications and all other information that might affect the validation of the data.

SAMPLE EVENT NUMBER: A unique identifier number beginning at '001' that identifies a sampling event(s) within an individual RIN. This identifier increases sequentially until the RIN changes.

SAMPLE NUMBER (SITE SAMPLE NUMBER): A unique identification number generated by concatenation of the Report Identification Number, Sample Event Number, and the Bottle Identification Number. The format for the site sample number is YY*NNNN-EEE.BBB, where YY*NNNN' is the RIN (* may be any character), 'EEE' is the sample event number that starts at '001' and increases sequentially until the RIN changes and resets the sample event number back to '001', 'BBB' is the Bottle Identification Number that starts at '001' and increases sequentially for all sample bottles taken within an event. The following is an example of a site sample number: 97J1234-001.001. All components of the sample number may be found on the COC.

SCINTILLATOR: A transparent substance that emits visible or near-ultraviolet light when traversed by an ionizing particle.

SECONDARY STANDARD: A standard solution prepared at a medium concentration by dilution of the stock standard. Secondary standards also may be purchased from a chemical supply house.

SITE: The Rocky Flats Environmental Technology Site.

SITE SAMPLE IDENTIFIER: See SAMPLE NUMBER.

SOIL: Synonymous with soil/sediment or sediment as used herein.

SPIKE: In radiochemical analysis, an accurately measured amount of tracer quantitatively introduced or transferred into a sample aliquot.

STOCK STANDARD: A standard solution at a relatively high concentration which can be diluted to derive other standards. Stock standards may be purchased from a chemical supply house or prepared from neat compounds at the laboratory. Synonymous with parent or primary standard.

SUPERNATANT: Liquid material above a precipitate or solid.

TOTAL RECOVERABLE: The concentration of an analyte determined in a non-filtered sample following an sample digestion procedure specific to the analyte and procedure.

TRACER: A radionuclide that chemically mimics and does not interfere with the target radioanalyte through the chemical preparation and instrument analysis.

TRACER CHEMICAL RECOVERY: The percent yield of the recovered tracer radio-isotope after the sample/tracer aliquot has undergone preparation and instrument analysis.

VALIDATED TIME OF SAMPLE RECEIPT (VTSR): Synonymous with Laboratory Receipt Date as used herein.

VERIFIED DATE OF RECEIPT: The date the Subcontractor receives a SDP for verification or validation.

WATER: Synonymous with aqueous or wastewater as used herein.

WET WEIGHT: The weight of a sample aliquot including moisture (non-dried).

WORKING STANDARD: A daily calibration standard solution prepared by diluting the secondary standard. Working standards are prepared at multiple concentrations from the same secondary standards.

10% FREQUENCY: A frequency specification during an analytical sequence allowing for no more than 10 analytical samples between required calibration verification measurements, as specified by the Statement of Work.

3. ACRONYMS

AA	Atomic Absorption
AIHA	American Industrial Hygiene Association
ANSI	American National Standards Institute
APHA	American Public Health Association
APO	Analytical Projects Office
ASD	Analytical Services Division
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWS	Alternate Work Schedule
BNA	Base Neutral Acid (Semivolatile organic)
BOA	Basic Ordering Agreement
BOD	Biological Oxygen Demand
CBOD	Carbonaceous Biological Oxygen Demand
CCB	Continuing Calibration Blank
CCV	Continuing Calibration Verification
CDPHE	Colorado Department of Public Health and Environment (formerly CDH, Colorado Department of Health)
CFR	Code of Federal Regulations
CL	Confidence Limit
CLP	Contract Laboratory Program
COC	Chain-of-Custody
COD	Chemical Oxygen Demand
cpm	Counts Per Minute
CRDL	Contract Required Detection Limit
CRQL	Contract Required Quantitation Limit
CTR	Contractor Technical Representative
CVAA	Cold Vapor Atomic Absorption Spectrometry
DA-LIC	Data Assessment Line Item Code
DCO	Document Control Officer
DEAR	Department of Energy Acquisition Regulations
DI	Deionized (water)
DIC	Dissolved Inorganic Carbon
DOC	Dissolved Organic Carbon
DOE	Department of Energy
DOT	U. S. Department of Transportation
dpm	Disintegration Per Minute
dps	Disintegration Per Second
DQA	Data Quality Assessment
DRC	Data Review Checklist
EDCN	Environmental Data Collection Network
EDD	Electronic Data Deliverable
EM	Environmental Management
EML	U. S. DOE Environmental Monitoring Laboratory
EMSL	U. S. EPA Environmental Monitoring Systems Laboratory
EPA	U. S. Environmental Protection Agency
EPA-600	EPA-600/4-79-020 <i>Methods for Chemical Analysis of Water and Wastes</i>
EQL	Estimated Quantitation Limit
ERM	Environmental Restoration Management
ERWM	Environmental Restoration & Waste Management

FEP	Full Energy Peak or Photopeak
FLAAS	Flame Atomic Absorption Spectrometry
FWHM	Full Width at Half Maximum
GAC	Granular Activated Carbon
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
GERST	General Employee Radiological Site-Specific Training
GERT	General Employee Radiation Training
GET	General Employee Training
GFAAS	Graphite Furnace Atomic Absorption Spectrometry
GLP	Good Laboratory Practice
GPC	Gas Proportional Counter
GRRASP	General Radiochemistry and Routine Services Protocol
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICP	Inductively Coupled Plasma
ICPES	Inductively Coupled Plasma Emission Spectrometry
ICP-MS	Inductively Coupled Plasma Mass Spectrometry
ICRP	International Commission on Radiological Protection
IDL	Instrument Detection Limit
IPA	Instrument Performance Assessment
IR	Infra-red
KLP	Kinetic Laser Phosphorescence
KPA	Kinetic Phosphorescence Analysis
LIC	Line Item Code
LSC	Liquid Scintillation Counter
MAPEP	Mixed Analyte Performance Evaluation Program
M&TE	Measuring and Testing Equipment
MB	Matrix Blank
MDA	Minimum Detectable Activity (Radiochemistry Modules), Minimum Detectable Amount (Bioassay Modules)
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MSDS	Material Safety Data Sheet
N/A	Not Applicable
NB	No Bid
NCN	Non-Compliance Notification
ND	Not Determined
NEG	No Established Guidelines
NARA	National Archive Record Act
NIOSH	National Institute of Occupational Safety and Health
NIST	National Institute of Standards and Technology
NCN	Non-Compliance Notification
NPDES	National Pollutant Discharge Elimination System
NRC	Nuclear Regulatory Commission
NVSS	Non-Volatile Suspended Solids
OMB	Office of Management and Budget
OSWER	U. S. EPA Office of Solid Waste and Emergency Response
PB	Preparation Blank
PCB	Polychlorinated Biphenyls

PE	Performance Evaluation
PN	Price Negotiable
PQL	Practical Quantitation Limit
QA	Quality Assurance
QAO	Quality Assurance Officer
QC	Quality Control
RASP	Radioanalytical Services Protocol
RCRA	Resource Conservation and Recovery Act
RDL	Required Detection Limit
RFEDS	Rocky Flats Environmental Data System
RFETS	Rocky Flats Environmental Technology Site
RF #	Rocky Flats Number
RFP	Rocky Flats Plant
RIN	Report Identification Number
ROI	Region of Interest
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
SDP	Sample Data Package
SIC	Site Identification Code
SM	Standard Methods
SOP	Standard Operating Procedure
SOW	Statement of Work
SRM	Standard Reference Material
SW-846	U. S. EPA-OSWER Document <i>Test Methods for Evaluating Solid Waste</i>
TAT	Turn Around Time
TAL	Target Analyte List
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TIC	Tentatively Identified Compound
TIC	Total Inorganic Carbon
TKN	Total Kjeldahl Nitrogen
TOC	Total Organic Carbon
TOX	Total Organic Halides
TPH	Total Petroleum Hydrocarbons
TS	Total Solids
TSD	Treatment Storage Disposal
TSS	Total Suspended Solids
TVSS	Total Volatile Suspended Solids
USEPA	United States Environmental Protection Agency
VDR	Verified Date of Receipt
VTSR	Validated Time of Sample Receipt
VOA	Volatile Organic Analysis
VOC	Volatile Organic Compound
WQP	Water Quality Parameter