



STATEMENT OF WORK

for

**GENERAL SAMPLING
ACTIVITIES**

MODULE AS01-B

May 31, 2000

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**REQUIREMENTS
FOR
GENERAL SAMPLING ACTIVITIES**

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GENERAL SAMPLING ACTIVITIES

INTRODUCTION

The Rocky Flats Environmental Technology Site (Site) Statement of Work (SOW), *General Sampling Activities*, module AS01 defines the requirements necessary for the sampling radioactive and non-radioactive materials, field measurements and sample transfers.

When Site personnel (customers) are in need of laboratory analyses for samples, the Analytical Services Division (ASD) is contacted to initiate a sampling project and/or laboratory analysis. A sampling project includes all pre-sampling activities, the collecting of the samples for laboratory analyses, sample labeling and packaging, and transfer and /or shipment of the samples to laboratories. The sampling personnel must comply with all Site and building specific regulations.

ASD personnel and the customer generate together an ASD Sample Analysis Request Form (SARF). When all applicable information has been entered, the SARF is forwarded to the sampling subcontractor for further review. If the information on the SARF is complete and understood, the sampling subcontractor will schedule the sampling project with the customer.

Samplings in radiological controlled areas require that a specific Radiological Work Permit (RWP) be obtained and strictly followed. The customer, as part of their pre-sampling responsibilities, will obtain the RWP prior to the sampling event.

Whether a sampling project involves the collection of radiological/non-radiological or hazardous/non-hazardous samples, Standard Operating Procedures (SOPs), either subcontractor or Site will be required to provide the following information:

- method of collection/sampling equipment
- sample containers/equipment decontamination and disposal
- field parameters and measurements
- sampling parameters
- sample collection, bottling, and preservation
- sample disposal
- quality assurance/quality control (QA/QC)
- documentation and data management

Samples shall be packaged, transferred On-Site and shipped Off-Site to laboratories for analyses using the *On-Site Transfer and Off-Site Shipment of Samples* procedure, PRO-908-ASD-004. This procedure implements the requirements of the *Site Transportation Safety Manual (STSM)*, MAN-T91-STSM-001 as related to all aspects of the sample identification, handling, packaging, transfer, and shipment of hazardous and radioactive samples to On-Site and Off-site laboratories.

A sample Chain of Custody (COC) shall be used to document sample collection, transfer and shipment of the samples to laboratories.

The following Exhibits and Appendices of *General Sampling Activities* provide the technical requirements under this subcontract.

EXHIBIT A

SUMMARY OF REQUIREMENTS

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GENERAL SAMPLING ACTIVITIES

SUMMARY OF REQUIREMENTS

1. SUMMARY OF AS01 MODULE EXHIBITS

This AS01 Module or Statement of Work (SOW) comprises seven Exhibits that delineate the requirements for General Sampling Activities. Exhibit A provides an overview of the SOW and its general requirements. Exhibit B contains all reporting and deliverable requirements. Exhibit C contains the Line Item Codes (LICs) for specified services of this SOW work scope (i.e., sample collection and transfer). Exhibit D contains the specific procedures required and defines the applications of these procedures. Exhibit E contains general and specific QA/QC requirements. Exhibit F contains the evidentiary requirements including, chain-of-custody and evidentiary document control requirements that must be followed in processing samples 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. When a term is used in the text without definition, the glossary meaning shall be applicable. Exhibit H contains references applicable to AS01.

2. GENERAL REQUIREMENTS

2.1. Work Scope

- 2.1.1. **SOW Compliance:** Sampling activities shall meet all the requirements specified in this AS01 General Sampling Activities Statement of Work (SOW). If necessary, the subcontractor shall modify their standard methods to comply in all respects to the SOW requirements and submit the modified methods for approval when requested by the Contract Technical Representative (CTR).
- 2.1.2. **Guidance:** All work performed under this SOW shall be done by the subcontractor under the guidance of the CTR, or if applicable, by designated agents in accordance with contractual agreements.
- 2.1.3. **Work Performed Outside Scope of SOW:** Any additional costs not addressed by this SOW shall be agreed upon in writing by the CTR prior to the performance of the work or such costs will become the responsibility of the subcontractor.
- 2.1.4. The subcontractor shall work with the K-H ASD CTR to develop new LICs for additional sampling activities and to revise LICs to implement Reverse Invoicing.

2.2. Conduct of Work

- 2.2.1. During the conduct of work, the subcontractor shall adhere to site safety policies and procedures when performing tasks at the Site. The subcontractor shall have established policies and procedures that address potential toxic, hazardous and radioactive contamination associated with working at the Site whether in the office or in the field.
- 2.2.2. The subcontractor shall adhere to Site policies and procedures regarding Site Security and the handling of sensitive and classified information.
- 2.2.3. The subcontractor's personnel shall complete and stay current with all appropriate levels of Site, DOT, and DOE training whether the training is provided or not by the Site.

- 2.2.4. The subcontractor shall have and follow procedures for sampling, field measurements and On-Site sample transfer that is in accordance with Site, DOT, and DOE regulations and procedures.
- 2.2.5. **Sampling Turn-Around-Times (TAT):** Sampling TAT is determined by the customer and ASD Project Lead for each sampling project. Sampling TATs are to be based upon the following: Routine TAT (5 day TAT), Priority TAT (3 day TAT), and Rush (1 day TAT). If the subcontractor does not meet the required TAT, the subcontractor may be denied by the CTR the Unit Rate Charge for the TAT or LIC requested.
- 2.2.6. The subcontractor shall also be responsible for transfer of the samples to the laboratory designated by the Kaiser Hill Analytical Services Division (ASD). This will encompass the appropriate packaging and labeling of samples for Off-Site shipment as well as the transfer of samples to an On-Site laboratories. At NO time shall the subcontractor ship samples to a laboratory without a Report Identification Number (RIN), Laboratory and LIC assigned by ASD. Also, the subcontractor shall only transfer samples to a laboratory assigned by the CTR or the CTR's designated representative.
- 2.2.7. **Sample Size:** The Laboratories contracted by the Site shall specify the amount of sample (weight or volume) required to perform analytical determinations. The subcontractor shall comply with required weights or volumes at all times. Deviations may occur only with a written statement from the CTR or designated laboratory CTR.
- 2.2.8. **Sample Containers:** The subcontractor shall provide sufficient quantities of sampling vials/bottles and labels at the site to ensure availability for all users. This includes containers for customers who routinely take their own samples or who have radioactive or hazardous materials that require special handling and safety issues. Appropriate documentation shall be maintained that document containers meet required testing criteria.
- 2.2.9. **Process Knowledge:** The Sender/Custodian is responsible for providing process knowledge for each waste stream, spill, or sampling event. Process knowledge shall include location, identification number and description including radioactive and chemical hazards. Some specific analysis parameters have been previously identified through the RCRA permit and other will vary with each waste stream, spill, or sampling event.
- 2.2.10. **Sample Shipments:** The subcontractor shall only transfer samples to a laboratory assigned by the CTR or the CTR's designated representative. Sample shipments to a laboratory will be scheduled and coordinated by the subcontractor. The subcontractor shall communicate with the Laboratory Shipping/ Receiving Officer by telephone or fax using appropriate documentation as necessary throughout the process of sample scheduling and shipment to ensure that samples are properly processed. The subcontractor shall notify the laboratory CTR when shipments are delayed.

- 2.2.10.1. Transfer of samples to the laboratory will be the responsibility of the subcontractor.
- 2.2.10.2. If there are problems with samples (e.g., broken or leaking containers) or sample documentation/paperwork (e.g., missing, incomplete, or conflicting COC forms) when received by a laboratory, the subcontractor shall assist the CTR with an immediate resolution.
- 2.2.11. **Building Rules and Regulations:** The sampling process is complex and complicated and can vary from building to building or even between similar sampling events within the PA. Therefore, the subcontractor shall become familiar with each building's rules regarding entry requirements since each building within the PA has specific and sometimes differing requirements.
- 2.2.12. **New Method Evaluation:** The subcontractor shall evaluate new sampling methods that become available and determine the applicability to Site sampling. Request for new method approval shall be done in writing to the CTR.
- 2.2.13. **Information Release:** Communication by subcontractor personnel of sampling information or similar matters shall be performed in accordance with procedures established in this module. In no case shall information be released to a third party without prior written approval of the CTR.
- 2.2.14. **Multiple Phased Samples:** If a sample consists of more than one phase (e.g., water miscible, non-water miscible, and solid), the subcontractor shall contact the sender/custodian and/or ASD Project lead (PL) to determine whether the sample shall be collected in one or more containers.
- 2.2.15. **Analytical Services Toolkit (AST):**
 - 2.2.15.1. All sampling paperwork shall be generated by the subcontractor utilizing the AST, including but not limited to, the Sample Summary, the COC, and sample labels.
 - 2.2.15.2. The subcontractor shall enter sampling field information such as sampling date and time into AST.
- 2.3. **QA/QC Requirements**
 - 2.3.1. The subcontractor shall strictly adhere to all QA/QC requirements prescribed in Exhibits D and E of this AS01 Module.
 - 2.3.2. The Subcontractor shall adhere to all Chain-of-Custody (COC) requirements defined in Exhibit F and PRO-543-ASD-002, *INITIATION, PREPARATION, AND IMPLEMENTATION OF CHAIN-OF CUSTODY FORMS*.
 - 2.3.3. The subcontractor shall be subject to assessments as described in Exhibit E of this SOW.
- 2.4. **Hazards Control**
 - 2.4.1. The samples to be handled by the subcontractor may contain potentially radioactive and hazardous inorganic, and/or organic materials. The subcontractor personnel shall be made aware of the potential hazards associated with the sampling, analysis, and transfer of these samples. The subcontractor shall have a documented Chemical Hygiene/Hazard Communication Program reflecting actual process operations.

- 2.4.2. The subcontractor is responsible for providing a safe working environment. The Site assumes no responsibility for the adequacy and effectiveness of the subcontractor's health and safety program or its implementation.
- 2.4.3. **Personal Protective Equipment:** Proper and specified protective clothing and equipment must be worn by the individuals who are involved in sampling activities. This may include company-provided clothing, safety shoes, chemical resistant gloves, full-face respirator, SCBA units, and safety glasses. The subcontractor shall ensure that protective apparel and safety equipment are available and compatible with the degree of protection required for the substances handled.
- 2.4.4. In the case of potential radioactive and chemical hazards, the subcontractor shall not transfer or ship samples without confirmation of known hazards by the sender/custodian.
- 2.4.5. The subcontractor shall maintain and document fume hood operation in compliance with ANSI/AIHA Z9.5-1992 (Laboratory Fume Hood Section) and ANSI/ASHRAE 110-1195 procedures and other Federal and State regulations.
- 2.4.6. The subcontractor shall operate under the requirements defined in the Site Radiation Control Manual, other applicable Site safety documents, 10 CFR 835 and DOT49 CFR 100-172.
- 2.4.7. The subcontractor shall develop and implement an emergency response plan in conjunction with the Site plan and procedures for accidental sample spills. This plan must address spill containment, cleanup, reporting, and emergency procedures.
- 2.4.8. Prior to the introduction of any Hazardous Chemical to the site, the subcontractor shall ensure that the CTR has prepared a Chemical Lifecycle/Integrated Work control Program (IWCP) Chemical Inventory form and has a copy of the MSDSs.
- 2.4.9. The subcontractor shall have a chemical management plan that includes the clear marking or labeling of all chemicals not in their original container and control of expired chemicals.
- 2.4.10. The subcontractor shall have Material Safety Data Sheets (MSDSs) for all chemicals used. MSDSs shall be readily accessible to employees.

2.5. **Waste Management**

- 2.5.1. The subcontractor shall develop, implement, and maintain a Waste Management Program documenting procedures for handling all waste created by the subcontractor and disposition of all waste in accordance with Site, Federal, State, and local laws and regulations.
- 2.5.2. Unless directed otherwise by the CTR, the subcontractor shall be responsible for the proper disposal of all waste generated at the subcontractor's facility and in the transport vehicles.
- 2.5.3. Evidence of improper waste disposition or documentation may result in a **SUBCONTRACT TERMINATION**.
- 2.5.4. The subcontractor shall document the disposition and disposal location of waste generated at the subcontractor's facility and/or from transport vehicles. Records shall be maintained as required by any applicable Site, federal, state, and/or local laws. These records shall be available for inspection upon request.

2.6. **Operating Hours and Timelines**

- 2.6.1. **Normal Business Hours:** The subcontractor shall work the Site Alternate Work Schedule (AWS) and shall be available for sampling from 6:30 A.M. to 4:30 P.M. on Monday through Thursday, and from 6:30 A.M. to 3:30 P.M. on the non-Alternate Work Schedule Fridays.
- 2.6.2. **Off-Normal Business Hours:** The subcontractor shall provide support during off-normal business hours at the request of the CTR. A point of contact, available by phone or pager shall be provided to the CTR for requesting emergency sampling and transferring services outside of normal business hours.
- 2.6.3. **Emergency Response:** The sampling team is an integral part of the emergency response team at the Site. Two sample team members shall be on call at all times to provide sampling in emergency response activities.
- 2.6.4. Timelines given in terms of Turn-Around-Times (TATs) are to be interpreted as business days throughout this SOW unless otherwise noted. Other timelines given in terms of days should be interpreted as calendar days unless otherwise noted.
- 2.6.5. **Holiday List:** A list of subcontractor's recognized holidays shall be submitted at subcontract award and at any time the holiday listing changes.

2.7. **Reports**

- 2.7.1. **Weekly Status Report:** The subcontractor shall provide a weekly status report summarizing sampling and transfer activities to the CTR in accordance with Exhibit B. The report shall contain information in a format that is acceptable to the CTR.
- 2.7.2. The subcontractor shall provide a formal written report and additional information or explanations in response to sample losses and damage, and other sampling and transfer problems. Those responses shall be in accordance with the deliverable schedule in Exhibit B.
- 2.7.3. The subcontractor shall provide Audit Response, Corrective Action, and Nonconformance Reports as directed in Exhibit E.

2.8. **Notification Requirements:** The subcontractor shall meet the following notification requirements:

- 2.8.1. **Sample Protection:** The subcontractor shall ensure that all samples are protected from accidental damage, theft or malicious mischief and shall immediately advise the CTR of any losses or damage as given in Exhibits B and F. The subcontractor shall complete a formal written report with a corrective action plan upon request of the CTR.
- 2.8.2. **Procedures:** The subcontractor shall maintain accurate up-to-date procedures and shall make copies available for inspection according to Exhibit B. The subcontractor shall notify the CTR in writing prior to the implementation of new or revised procedures that affect the activities performed under this SOW.
- 2.8.3. **Personnel:** The subcontractor shall notify the CTR in writing prior to any proposed personnel assignment changes in *Key Personnel*. Notification shall be given to the CTR not less than 14 calendar days prior to any proposed changes when applicable or sufficient prior notification of separation has been received. Also, a detailed resume for the new replacement of *Key Personnel* shall be provided to the CTR within 7 days of

their appointment. The resume shall include position, description, title, education and experience (pertinent to the duties performed for this subcontract).

3. FACILITIES AND EQUIPMENT

3.1. Facilities

- 3.1.1. The subcontractor will use the existing Site facility in T891V or other designated facilities.
- 3.1.2. The subcontractor will evaluate, upon request of the CTR, proposed sampling facilities and work with the CTR to determine an appropriate location on the Site to relocate the facility.
- 3.1.3. The subcontractor shall be responsible for ensuring that T891V or a new facility complies with all the pertinent Site requirements related to health and safety and facility management. The subcontractor shall also ensure that facilities are maintained and operated to emphasize contamination control to preclude the possibility of cross-contamination from radiological or environmental sources.

3.2. **Instrumentation:** The subcontractor shall have sufficient equipment and capability to meet all terms and conditions of this SOW, including instrument calibration.

3.3. **Materials and Equipment:** The subcontractor shall supply all materials and equipment, except government-furnished-equipment (GFE), necessary to perform this SOW, unless directed otherwise, in writing, by the CTR. Materials shall be of the quality and capability necessary to meet the requirements of this SOW. All materials and equipment shall be purchased per the requirements of the subcontractor's QA Plan.

3.4. Vehicles

- 3.4.1. Government vehicles shall be provided when subcontractor vehicles are not allowed within Site areas such as the Protected Area (PA) for sampling activities or not allowed to transfer fissile material.
- 3.4.2. Vehicle leases shall be the responsibility of the subcontractor
- 3.4.3. Vehicles used in the transportation of fissile material shall have a 200 gram limit for fissile material.
- 3.4.4. Vehicles approved for the transfer of fissile material shall be limited to the transfer of material in 1-gallon cans only
- 3.4.5. The transfer of 1-gallon cans shall be in a one-layer planar array.

4. ORGANIZATION AND KEY POSITION REQUIREMENTS

4.1. **Organization:** The subcontractor's organization must be clearly structured with well-defined responsibilities for each individual in the management system. This subcontractor shall ensure that sufficient personnel are maintained to perform the requirements of this SOW. Specifically, all *Key Positions* listed below shall be assigned to individuals. The subcontractor shall maintain a chart or diagram illustrating the subcontractor's organizational structure and all *Key Position* assignments. The subcontractor shall provide this chart and resumes for *Key Positions* to the

CTR prior to contract award and within seven days following changes in key personnel. Résumés shall include position description, title, education (pertinent to the duties performed for this SOW), number of years of experience (pertinent to the duties performed for this SOW), month and year hired, previous experience, and publications.

- 4.2. **Key Position Requirements:** The subcontractor shall assign individuals the responsibilities for the *Key Positions* listed below to perform the minimum functional requirements necessary to meet the terms and conditions of this subcontract. Minimum academic training and experience qualifications are identified below. All positions listed below are considered *Key Positions* for this subcontract. A qualifying individual may fill more than one of the *Key Positions*.

Unless otherwise noted, the following technically relevant experience may be substituted for educational requirements, such that 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.

4.2.1. *Technical Supervisor:*

Responsibility: Responsible for all technical efforts of sampling team personnel.
Academic Training: A bachelor's degree (or equivalent) in a science discipline.
Experience: A minimum of three years of sampling experience, with at least one year of experience in a supervisory position and one year of laboratory experience.

4.2.2. *Site Project Manager:*

Responsibility: Responsible for overall aspects of this SOW (from sample request to sample receipt by an On-Site Laboratory or shipper), and serves as the primary contact for the CTR.
Academic Training: A bachelor's degree (or equivalent) in a science discipline.
Experience: A minimum of two years of sampling experience, one year of laboratory experience, and at least two years of management experience.

4.2.3. *Quality Assurance Officer (QAO):*

The QAO shall have direct access to management at a level where appropriate action can be effected.

Responsibility: Responsible for assuring the subcontractor's QA Program meets all requirements of this SOW. Reports directly to upper management.
Academic Training: A bachelor's degree (or equivalent) in a science discipline.
Experience: A minimum of 3 years of sampling experience, including at least one years of applied experience with QA principles and practices in sampling and one year's laboratory experience.

4.2.4. *Health and Safety Officer:*

- Responsibility: Responsible for overseeing the Health and Safety Program including personnel monitoring activities for hazardous, chemical, and radiological (if applicable) contaminants.
- Academic Training: A bachelor's degree (or equivalent) in a science discipline and the academic training to include radiation health courses.
- Experience: A minimum of four years of experience in chemical and radiological safety, including at least two years of applied experience with sampling health and safety practices.

4.3. **Personnel Requirements:**

- 4.3.1. Subcontractor sampling personnel shall have extensive experience in the handling of and working with radioactive fissile materials (i.e., plutonium, americium, etc.).
- 4.3.2. Subcontractor sampling personnel shall have experience in working in radioactively-contaminated gloveboxes and shall be well trained in all safeguards necessary for the prevention of a nuclear criticality.
- 4.3.3. Subcontractor sampling personnel are required to possess a "Q" security clearance granted by the Department of Energy (DOE). The "Q" clearance is necessary for access to most areas in the Protected Area (PA). This includes access to a RMMA, RMA, CA, HCA, RCA. Without a "Q" clearance, personnel are restricted from entering certain areas and will not be allowed to perform sampling events.
- 4.3.4. Subcontractor sampling personnel must be designated as Material Handlers as well as Material Transporters which means that through training and experience in working with and handling radioactive materials they are qualified to handle and transport radioactive materials. This designation is evident by the placement of a distinct marking on the "Q" clearance security badge.

5. **TRAINING**

- 5.1. **Training Requirements:** Subcontractor sampling personnel are required to successfully complete and pass the following Rocky Flats specific training courses before being allowed to participate in sampling events. For those courses requiring annual refreshers, the subcontractor shall ensure that the annual training is complete prior to training expiration date. Number in parenthesis are course numbers:

- AERIAL LIFT TRAINING (018-211-03) (Biennial)
- ALARMS AND SOUNDS (012-273-01) (Annual)
- ASBESTOS AWARENESS (056-352-01) (Annual)
- BERYLLIUM OPERATIONS (056-286-01) (Biennial)
- COMPUTER SECURITY USER (079-595-01) (Annual)
- HAZARD COMMUNICATIONS WORK AREA INDOCTRINATION (019-750-03) (Biennial)
- BUILDING INDOCTRINATION (Building Management, 1-Time)
- CONFINED SPACE ENTRY (068-741-01) (Annual)

- DEPARTMENT OF ENERGY EM-561 HAZARDOUS MATERIALS TRAINING (023-434-02) - (Biennial)
- DEPARTMENT OF TRANSPORTATION (DOT) AWARENESS (023-434-01) (Triennial)
- DOT TRANSPORTATION OF RADIOACTIVE MATERIALS (023-434-03) Triennial
- FALL PROTECTION AWARENESS (025-976-01) (Biennial)
- GENERAL EMPLOYEE TRAINING (GET) (019-235-01) (1 Time) (New Employees Only)
- GENERAL EMPLOYEE TRAINING – REFRESHER (019-235-02/BLDGSP (Biennial)
- GLOVEBAGS (027-938-01) (Biennial)
- GLOVEBOX SUPPORT ACTIVITIES (027-430-01) (Biennial)
- HAZARDOUS COMMUNICATIONS (019-750-01) (Biennial)
- HAZARDOUS WASTE OPERATIONS - 40 Hr. OSHA (018-691-20) (1 Time with annual 8 hour refresher course)
- HEARING CONSERVATION (071-400-01) (Annual)
- LADDER SAFETY AWARENESS (025-985-01) (Biennial)
- LEAD IN THE WORKPLACE (019-574-02) (Annual)
- NUCLEAR CRITICALITY SAFETY TRAINING FOR FISSIONABLE MATERIAL HANDLERS (023-415-04/FMH) (Biennial)
- NUCLEAR MATERIAL HANDLING AND TRANSPORTING (038-588-01) (Annual)
- NUCLEAR MATERIAL SAFEGUARD (038-597-01) (Biennial)
- PCB AWARENESS (068-124-01) (1 Time)
- PREMIERE RESPIRATOR: INITIAL TRAINING (012-931-01) (1 Time)
- RADIOLOGICAL INTERACTIVE WORKER VIDEO DISC (IVD): academic re-training (023-489-02) (Biennial)
- RADIOLOGICAL WORKER INTERACTIVE VIDEO DISC (IVD): ACADEMIC INITIAL TRAINING (023-489-01) (1 Time)
- RADIATION WORKER LEVEL 2 PRACTICAL FACTORS (023-484-00) (Biennial)
- RCRA COMPLIANCE (023-435-01) (Annual)
- RESPIRATOR INDOCTRINATION (056-284-01) (Annual)
- SCBA (SELF CONTAINED BREATHING AIR) (019-170-01) (1 Time)
- SCBA (SELF CONTAINED BREATHING AIR) MARK II (019-170-01) (1 Time)
- SITE SAFETY ENVELOPE TRAINING (057-277-01) (Biennial)
- TAMPER INDICATION DEVICE (TID) APPLICATOR/WITNESS (061-350-01) (Annual)
- TAMPER INDICATION DEVICE (TID) OJT (061-350-03) (Annual)
- WASTE GENERATOR ALL AREAS INITIAL QUALIFICATION (067-576-01) (1 Time)
- WASTE GENERATOR ALL AREAS REQUALIFICATION, RCRA/WASTE GENERATOR TRAINING (018-816-06) (Annual)

- 5.2. **Analytical Services Toolkit (AST):** The subcontractor shall be trained on the system applicable to specific job functions..
- 5.3. **On-the-Job-Training Program:** The Subcontractor shall develop and administer an On-The-Job-Training Program which covers all aspects of sampling hazardous and radioactive materials. An On-The-Job-Training-Checklist shall be completed for each of the sample team personnel and maintained in the permanent personnel records.
- 5.4. **Oral and Written Examinations:** The subcontractor shall develop and administer written and oral examinations to all sample team employees. Results of the examinations shall be maintained in the employees' permanent records. The examinations shall be administered annually as part of the sampler recertification program. At a minimum, the exams shall cover
- Custody Seals
 - Sample container labels and the information they contain
 - Chain-of-Custody Forms
 - Sample Analysis Plan (SAP)
 - Sample collection
 - Field measurements:
 - Transfer of samples
 - Storage of Samples
 - Pre-sampling activities
 - Equipment decontamination
 - Sample packaging
 - Health and Safety
 - Radcon Manual
 - Nuclear Material Safeguards
 - Emergency procedures including, but not limited to, chemical burn, chemical spill, container breaks, fire in a glovebox, fire in the sampling area, glovebox criticality limits exceeded, loss of room airflow, loss of supplied air flow; loss of glovebox airflow; and pressurized container rupture.

6. SAMPLING REQUIREMENTS

- 6.1. The subcontractor shall:
- Have trained and certified personnel in accordance with 49CFR 172.704.
 - Comply with the requirements of the *Site Transportation Safety Manual (STSM)*, MAN-T91-STSM-001.
 - Ensure that the material to be transferred, which meets the definition of a Department of Transportation (DOT) Hazard Class (See the STSM), is properly identified, packaged, marked, labeled, stored incident to transfer, and transferred.
 - Comply with the requirements of 1-P73-HSP-18.10, *Radioactive Material Transfer and Unrestricted Release of Property and Waste*.

- Comply with the requirements of PRO-908-ASD-004, *On-Site Transfer and Off-Site Shipment of Samples*.

7. CUSTOMER RESPONSIBILITIES

NOTE: Although the customer must complete the following requirements, the subcontractor must communicate with the customer to facilitate completion of these requirements so that the subcontractor will be able to complete the sampling project without having it canceled.

To ensure compliance with building regulations and to assure minimum impact to building operations, customer responsibilities include but are not limited to:

- 7.1. **Pre-Evolutionary Briefing:** Schedule a pre-evolutionary briefing with everyone involved with the sampling project.
- 7.2. This could include RCTs, pipefitters, carpenters, electricians, process specialists, a Subject Matter Expert (SME), or any of the maintenance/crafts personnel
- 7.3. **Pre-Sample Visit:** Schedule a pre-sample visit by Sample Team personnel if requested
- 7.4. **Plan of the Day (POD):** Get the Sampling Project or Event on the Plan of the Day
- 7.5. **Radiological Work Permit (RWP):** Arrange for a Radiological Work Permit that addresses the specific sampling event
- 7.6. **Radiological Control Technician (RCT):** Arrange for a Radiological Control Technician to be available for the sampling Project or Event with a calibrated gamma/neutron counter.
- 7.7. **Waste Disposal:** Arrange for waste disposal which may require the initiation of a NON-ROUTINE WASTE DISPOSAL LOG (NRWDL)
- 7.8. **Sample Return:** Customer must be able to take back unadulterated excess samples
- 7.9. **Tamper Indication Device (TID):** Notify Nuclear Material Safeguards (NMS) for a TAMPER INDICATION DEVICE (TID) and a NUCLEAR MATERIAL DRUM TRANSFER REQUEST (NMDTR) if the material being moved is accountable.

EXHIBIT B

REPORTING AND DELIVERABLES

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1. INTRODUCTION

This AS01 Exhibit B contains subcontractor reporting and deliverable requirements applicable to all sampling projects and transfers performed by the subcontractor. The following tables define these reporting and deliverable requirements:

- Table B-1 **SCHEDULE FOR GENERAL DELIVERABLES**
- Table B-2 **SAMPLING EVENT TURN-AROUND-TIMES**
- Table B-3 **DELIVERABLES FOR SAMPLING EVENT DOCUMENTS**
- Table B-4 **SUPPORT DOCUMENTATION**

These tables define the major components of the Exhibit B reporting and deliverable requirements. Text accompanying the tables provides structural and content requirements. These tables include the schedules and distribution (recipient) for each deliverable. All days listed are calendar days, except sampling event Turn-Around-Times (TATs) are business days. The Reference column in these tables contains designators that refer to Exhibits and Sections where more detail may be found. This column is provided as an aid in locating requirements but may not be all-inclusive.

2. GENERAL DELIVERABLE REQUIREMENTS

2.1. Schedule for General Deliverables

TABLE B-1 SCHEDULE FOR GENERAL DELIVERABLES

Item	Schedule	Recipient	Reference Exhibit/Section
Weekly Status Report	Weekly- Submitted as requested by the CTR, covering previous weeks services	CTR	Exhibit A Section 2.8
Point of contact for off normal hours & Emergency Response	Within 30 days of subcontract award and immediately following a new designation	CTR	Exhibit A Section 2.7
Holiday List	Within 30 days of subcontract award and immediately following a holiday list change	CTR	Exhibit A Section 2.7
Sample Loss, Damage, or Problem, including delay and cancellation of sampling events	Immediate verbal notification followed by e-mail notification. A formal written report with corrective action plan upon request of CTR.	CTR	Exhibit A Section 2.9 Exhibit B Section 2.3
SOPs	A list of SOPs within 30 days of subcontract award and within 7 days for new or amended SOPs; Copies of SOPs upon request.	CTR	Exhibit F Sections 3 & 4
QA Plan	At contract award and upon request	CTR	Exhibit E Section 3
Training Certification	Available upon request	CTR	Exhibit E Section 4
Organizational chart/diagram	At contract award and 7 days following change in key personnel	CTR	Exhibit A Section 4.1
Key Personnel Resume	At contract and 7 days of assigning new personnel to a key position	CTR	Exhibit A Section 4.1
Audit Assessment & Corrective Action Reports	As stated in Exhibit E Sections 9 and 10	CTR	Exhibit E Sections 9 & 10

TABLE B-1 SCHEDULE FOR GENERAL DELIVERABLES (continued)

Item	Schedule	Recipient	Reference Exhibit/Section
Thermometer certifications	Available upon request	Maintained by Subcontractor	Exhibit E Section 5
Automatic pipette documentation	Available upon request	Maintained by Subcontractor	Exhibit E Section 5
Refrigerator temperature documentation	Available upon request	Maintained by Subcontractor	Exhibit E Section 5
Instrument maintenance/repair documentation	Available upon request	Maintained by Subcontractor	Exhibit E Section 5
Sample vials/bottles/shipping containers	Available at all times	Maintained by Subcontractor	Exhibit A Section 2
Logbooks and documents	Available during assessments; Upon Request	CTR	Exhibit B Section 4

- 2.2. **Compliance:** All hard copy and other submittals not conforming to requirements shall be considered incomplete. The subcontractor will be required to resubmit such documentation with deficiencies corrected.
- 2.3. **Notification Requirements for Canceled Sampling Events:** The subcontractor shall notify the CTR immediately of any problems or conditions that affect the timeliness of the sampling event and consequently data reporting. In particular, the subcontractor shall notify the CTR in advance, if possible, regarding a delay in the sampling event and shall reschedule the sampling event with the customer.
- 2.4. **Document Control:** Document Control Requirements of Exhibit F, Section 3 must be applied to all deliverables. The subcontractor shall ensure that all documents are compiled in one location where possible and identified by the Report Identification Number (RIN).
- 2.5. **Labeling Requirements:**
- 2.5.1. All reports and documentation prepared for the Site shall be identified with the RIN, where applicable.
- 2.5.2. All submittals shall be clearly labeled, legible, and completed in accordance with instructions in Exhibit B, Section 4.

3. SAMPLING EVENT TURN-AROUND-TIMES (TATs)

3.1. Schedule for Sampling Event Turn-Around-Times

TABLE B-2 SAMPLING EVENT TURN-AROUND-TIMES

ANALYSIS TATs (From receipt of sample to return of data)	SAMPLING EVENT TATs (Business Days From subcontractor receipt of request to completion of sampling event)
ROUTINE (31 days)	ROUTINE (5 days)
PRIORITY (21 days)	PRIORITY (3 days)
RUSH (7 days)	RUSH (1 days)
RAPID (24 hours)	RAPID (1 hour)

3.2. The subcontractor shall respond to resubmission requests for re-sampling within the same TAT as the original request after the resubmission request is received.

3.3. **Sampling Turn-Around-Times (TAT):** Sampling TAT is determined by the customer and ASD Project Lead for each sampling project. If the subcontractor does not meet the required TAT, the subcontractor may be denied by the CTR the Unit Rate Charge for the TAT or LIC requested.

4. SAMPLING EVENT DOCUMENT DELIVERABLES REQUIREMENTS

4.1. Schedule for Sampling Event Deliverables

TABLE B-3 DELIVERABLES FOR SAMPLING EVENT DOCUMENTS

Item	Schedule	Recipient	Reference Exhibit/Section
Copy of Signed COCs and discrepancy reports	24 hours following sampling or as directed by the CTR	ASD or Records Storage	Exhibit B Section 4.3 Exhibit F Section 2
ASD Sample Summary Receipt	Upon completion of sampling Event	Customer	Exhibit F Section 5
Sampling Worksheet	24 hours following sampling or as directed by the CTR	ASD or Records Storage	Exhibit B Section 4.5
Sample Loss, Damage, or Problem, including delay or cancellation of sampling events	Immediate verbal notification followed by e-mail notification. A formal written report with corrective action plan upon request of CTR.	CTR	Exhibit A Section 2.9 Exhibit B Section 2.3
QC Sample Information	24 hours following sampling or as directed by the CTR	ASD or Records Storage	Exhibit E/Section 7
IW Report	24 hours following sampling	Customer	Exhibit B/Section 4
IW Report	24 hours following sampling or as directed by the CTR	ASD or Records Storage	Exhibit B/Section 4

- 4.2. **Original Documents:** All sampling event documents shall consist of original documents where possible. Original COC forms shall accompany samples to the laboratories for sample analyses. Photocopies of original documents may also be submitted if the original data were previously submitted under another RIN.
- 4.3. **RINs and Sampling Events:** Each sampling project shall be identified by a RIN supplied by the ASD. Several sampling events may be coupled under one RIN provided they are for the same customer or sampling project. A sampling event is defined as the collection of samples from the same location during the same time period and under the same environmental conditions. When any of the condition that define an event change, a new event number shall be assigned for the samples collected.
- 4.4. **Sampling Event Deliverables Requirements**
- 4.4.1. Chain of Custody (COC)
The signed and completed original COC shall be delivered with the sample to the laboratory. See Exhibit F, Section 2 for more details regarding COCs.
- 4.4.2. ASD Sample Analysis Request Form (SARF)
The ASD SARF contains information supplied by the customer to the CTR and the subcontractor. Copies of original and modified SARFs are to be transferred to ASD or designee to be retained in the ASD file for the associated RIN.
- 4.4.3. ASD Sample Request Worksheet
This worksheet is to be completed in the field by the subcontractor and transferred to ASD or designee to be retained in the ASD file for the associated RIN. This Form shall contain, but not be limited to the following information:
- Comments/Problems encountered during sampling
 - Sampling location description
 - Other sample ID
 - Sample Appearance
 - Sampling Device
 - Sample Date
 - Sample Time
 - Rad Screen Date
 - Samplers' Signatures
 - Employee Number
 - Field parameters (if applicable)
- 4.4.4. Incidental Waters Report Form
The subcontractor shall include all raw data for Incidental Water (IW) analyses on the IW report form. Instrument raw data must include all of the following:

- Analysis date and time
- Sample identifications (RIN)
- Analyst's initials
- IW report No.

4.4.5. Customer Check-off Form

All applicable entries on the Check-off Form shall be completed by the customer, signed and delivered to the subcontractor. The check-off form lists the following:

- Plan of the Day (POD): Get the Sampling Event on the Plan of the Day.
- Radiological Work Permit (RWP): Arrange for a Radiological Work Permit that addresses the specific sampling event.
- Integrated Work Control Package (IWCP): Arrange for a IWCP if the crafts and/or maintenance will be involved in the sampling event.
- Radiological Control Technician (RCT) support: Arrange for a RCT to be available at the sampling event if required. The RCT must also have a calibrated gamma/neutron instrument available since the magenta-colored **MATERIAL TRANSFER TAG (RF-47470)** requires that this information be filled in.
- Industrial Hygiene (IH) assistance: Arrange for IH personnel to be present if the sampling event involves hazardous chemicals (i.e., beryllium, asbestos, etc.) or if there is a health safety concern.
- Subject Matter Expert (SME): Arrange for a SME to be present at the sampling event, if applicable.
- Pre-evolutionary briefing: Schedule a Pre-evolutionary briefing with everyone present who will have anything to do with the sampling event (i.e., pipefitters, plumbers, carpenters, process specialists, electricians, etc.).
- Arrange for waste disposal: Arrange for waste disposal which may require the initiation of a **NON-ROUTINE WASTE DISPOSAL LOG (NRWDL)**.
- Nuclear Materials Safeguards (NMS) notification for accountable material: Notify NMS if the sampling event involves the movement of accountable fissile material. NMS will deliver to the customer a) **TAMPER INDICATION DEVICE (TID)** and a **NUCLEAR MATERIAL DRUM TRANSFER REQUEST (NMDTR)**.

4.4.6. Required instrument performance demonstrations shall be performed for each instrument used to generate data for the RIN under this SOW.

4.4.7. Logbooks

Documentation of all sampling events shall be recorded in a standard laboratory logbook. Each transport vehicle shall have a logbook assigned specifically to it. Subcontractor shall be instructed to document all sampling event activities and shall enter the following information:

- Sampling event date and time
- Sampling event location
- RIN for sampling event
- Deviations to the Sample Analysis Plan (SAP)
- Any other deviations to a planned sampling event

4.4.8. QC sample results shall be submitted with the Field Parameter data on the same form under the same RIN.

5. SUPPORTING DOCUMENTATION REQUIREMENTS

The Supporting Documentation is an ordered compilation of sampling activity information relevant to all aspects of data integrity for a single RIN. Much of this information is included by reference to subcontractor document storage locations.

5.1. Supporting Documentation Components:

Required components for support packages are listed in Table B4. Sections following the table contain minimum requirements for these deliverable sections. The "Reference" column in Table B4 refers to the document, Exhibit and Section where more details may be found. The information in this column is intended as an aid in locating requirements; additional requirements will be found in Exhibits B, E, and F

TABLE B-4 SUPPORT DOCUMENTATION

Deliverables Section Title	Reference Exhibit/Section
Document Inventory	Exhibit B/Section 5
Sample Surcharges	Exhibit B/Section 5
Sample Storage, Tracking, and Internal COC records	Exhibit B/Section 4 Exhibit F/Section 2
Copy of ASD Sample Analysis Request Form	Exhibit B/Section 4
Original Log Logbooks	Exhibit F/Section 3 Exhibit B/Section 4
Standard Operating Procedures	Exhibit F/Section 4

5.2. Document Inventory

The document inventory for the support documentation shall include a list of all documents in the file and the locations of all required documents that are not physically in the file.. All items listed in the document inventory shall be titled exactly as given under the "Deliverable Section Title" column of Table B4. Documents shall appear in the order listed on the document inventory.

5.3. Sample Surcharges

- 5.3.1. All documentation for the following, but not limited to, shall be developed by the subcontractor and approved by the CTR or designee.
- Cancellations/delays
 - Transport Only
 - Package and Transport
 - Sample containers
 - Chisels
 - Tongs
 - Pans
 - Spatulas
 - Aluminum Foil
- 5.3.2. All supporting documentation for Sample Surcharges shall be signed by the subcontractor and Sender/Custodian, and when completed given to the CTR or designee before invoices can be approved.

5.4. Support Package Schedules and Maintenance

- 5.4.1. All items listed in Table B4 shall be maintained by the subcontractor and be available for review during an on-site inspection and within seven calendar days of CTR request.
- 5.4.2. Support documentation shall be traceable to individual RIN's.
- 5.4.3. The support documentation shall be well organized for convenient retrieval and reproduction of all items.

5.5. Reporting Limits

- 5.5.1. **Required Detection Limits:** Required Detection Limits (RDLs) are specified in Exhibit C for applicable Line Item Codes. An RDL represents the minimum acceptable value that SHALL be reported for an Incidental Water (IW) or other sample analysis.
- 5.5.2. **Instrument Detection Limits (IDLs):** The subcontractor shall determine annually Instrument Detection Limits (IDLs) for field parameters with a RDL. These deliverables shall be documented and available upon request.
- 5.5.3. The IDLs for Reported data SHALL not exceed the RDLs (unless approval from the CTR was received prior to data submission).

5.6. Sample Dilutions

- 5.6.1. Sample dilutions are allowed when necessary to quantify a requested analysis; all required methods of analyses must meet the required detection limits unless otherwise stated in the SOP.
- 5.6.2. When dilutions are required due to off-scale responses, the subcontractor shall dilute the sample as necessary. Results shall not be diluted below the required detection limits.
- 5.6.3. When dilutions are required due to interferences, the subcontractor shall use the least dilution necessary to eliminate the interference or reduce the interference to acceptable levels. If the dilution brings the results to below the reporting limits, the subcontractor

shall contact the CTR and submit proof that intermediate dilutions could not eliminate the interference.

5.7. **Reanalysis**

- 5.7.1. When Quality Control (QC) samples fail to meet acceptance criteria, the subcontractor SHALL correct the problem and reanalyze samples with acceptable QC.
- 5.7.2. When reanalysis is performed due to QC failure, the subcontractor shall report a single final result.
- 5.7.3. Reanalysis shall be brought to the attention of the customer.
- 5.7.4. If reanalysis is performed at the customer request and not due to a QA failure, the subcontractor may be considered this a separate sample analyses for which the subcontractor will be paid.

6. **DATA ACCEPTANCE AND RESUBMISSIONS**

6.1. **Preliminary Use of Data**

- 6.1.1. Some data may be used prior to actual acceptance due to stringent reporting requirements imposed on the Site by oversight and regulatory agencies.
- 6.1.2. Preliminary use of data does not constitute acceptance.

6.2. **Criteria for Unacceptable Data:** Data may be classified as unacceptable for one or more of the following reasons:

- 6.2.1. Data cannot be validated as a result of the subcontractor's actions (e.g., not correcting an instrumentation nonconformance, improper sampling technique, samples exceeding holding time prior to delivery to laboratory, etc.).
- 6.2.2. The IDLs or MDLs exceed the RDLs
- 6.2.3. QC samples fail to meet acceptance criteria.

EXHIBIT C

SAMPLING EVENT FUNCTIONS

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GENERAL SAMPLING ACTIVITIES

LINE ITEM CODES

1. GENERAL SAMPLING ACTIVITIES LINE ITEM CODES

1.1. Introduction

All services for this AS01 Module, *General Sampling Activities* shall be performed on the basis of Unit Rate Charges (URCs). Each service is identified by a Line Item Code (LIC). Section 1.2 lists each LIC with a description of the service performed. Sections 1.3 through 1.5 define the services and give the basis used for the determination of each URC for each LIC.

1.2. TABLE C-1 GENERAL SAMPLING ACTIVITIES LINE ITEM CODES

The following Table C1 specifies the LIC to be used for each sampling service performed as given in the *SERVICES* column. The *SERVICES* column also gives in parentheses the costing basis (e.g., per sample) for the LIC URC. The *REFERENCE* column contains a Section number in Exhibit C where the service is defined and more information is provided for the costing basis or URC of each LIC.

TABLE C-1 GENERAL SAMPLING SERVICES LINE ITEM CODES

LINE ITEM	SERVICES	REFERENCE (Exh. C Section)
AS01B001	Sample Collection	1.3
AS01B002	IW Sample Collection	1.4
AS01B003	Concrete Coring	1.5

1.3. Basis for Individual Sample Collection LIC (AS01B001)

- 1.3.1. The URC shall be based upon a 2-person sampling crew.
- 1.3.2. An individual sampling cost may be charged for each sample collected.
- 1.3.3. For the purposes of the LIC, each sample is equal to each container collected.
- 1.3.4. The URC is excluded from the use with Incidental Water (IW) projects.

1.4. Basis for Incidental Water Sample Collection LIC (AS01B002)

- 1.4.1. The URC for the LIC shall include any combination of the following field analyses for pH, temperature, conductivity, or nitrate/nitrite.
- 1.4.2. The URC for the LIC shall include charges for delivery of samples to on-site laboratories for gross alpha/beta and Rad Screen analyses.

- 1.4.3. The URC for the LIC shall also include charges for delivery of other samples to on-site laboratories and on-site shipping locations for off-site shipments for other analyses
- 1.4.4. The off-site shipper may charge costs for shipment of additional samples to an off-site laboratory.

1.5. Basis for Concrete Coring LIC (AS01B003)

- 1.5.1. The URC shall be based upon a 2-person sampling crew.
- 1.5.2. Each core will not exceed 2 inches in length and will be an average of 3 inches in diameter.
- 1.5.3. The cost of any core analysis is not included.

2. GENERAL SAMPLING SERVICES SURCHARGES

2.1. Introduction

The following Table C2 specifies the LIC to be used for each sampling service performed as given in the *SERVICES* column. The *SERVICES* column also gives in parentheses the costing basis for the LIC URC. The *REFERENCE* column contains a Section number in Exhibit C where the service is defined and more information is provided for the costing basis or URC of each LIC.

2.2. TABLE C-2 GENERAL SAMPLING SERVICES SURCHARGES

LINE ITEM	SERVICES	REFERENCE (Exh. C Section)
AS01B501	Cancellation/delays	2.3
AS01B502	Transport Only	2.4
AS01B503	Package and Transport	2.5
AS01B504	Sample containers	2.6
AS01B505	Chisels	2.7
AS01B506	Tongs	2.8
AS01B507	Pans	2.9
AS01B508	Spatula	2.10
AS01B509	Aluminum Foil	2.11

2.3. Basis For Cancellation/delays LIC (AS01B501)

- 2.3.1. The URC applies to a cancelled sampling project or delay for a delayed project when notification from the customer of cancellation or delay is not received at least 48 hours prior to the original scheduled sampling project.

- 2.3.2. A cancelled sampling project is defined as one that will not be completed or rescheduled. While a delayed sampling project is one that is expected to be rescheduled.
- 2.4. Basis for Transport Only LIC (AS01B502)**
- 2.4.1. The URC for the LIC shall be based on a per trip basis regardless of the number of packages transferred.
- 2.4.2. The URC for the LIC may be charged when the subcontractor must return samples to a sender/custodian because the samples are too radioactive to be shipped to an off-site laboratory or analyzed for field parameters by the subcontractor.
- 2.5. Basis for Packaging and Transfer LIC (AS01B503)**
- 2.5.1. The URC for the LIC shall be based on the costs of packaging and transferring one paint can of samples to an on-site location.
- 2.5.2. The URC for the LIC may be charged when subcontractor personnel are requested to return samples to a customer and those samples require packaging prior to the transfer services.
- 2.6. Basis for Sample Container LIC (AS01B504)**
- 2.6.1. The URC for the LIC shall be based on the costs of providing sample containers for customers that provide their own sample collection.
- 2.7. Basis for Sample Chisels or Equivalent Sampling Equipment LIC (AS01B505)**
- 2.7.1. The URC for the LIC shall be based on the costs of providing sample equipment for customers that provide their own sample collection.
- 2.8. Basis for Sample Tongs or Equivalent Sampling Equipment LIC (AS01B506)**
- 2.8.1. The URC for the LIC shall be based on the costs of providing sample equipment for customers that provide their own sample collection.
- 2.9. Basis for Sample Pans or Equivalent Sampling Equipment LIC (AS01B507)**
- 2.9.1. The URC for the LIC shall be based on the costs of providing sample equipment for customers that provide their own sample collection.
- 2.10. Basis for Sample Spatula or Equivalent Sampling Equipment LIC (AS01B508)**
- 2.10.1. The URC for the LIC shall be based on the costs of providing sample equipment for customers that provide their own sample collection.
- 2.11. Basis for Sample Aluminum Foil or Equivalent Sampling Equipment LIC (AS01B509)**
- 2.11.1. The URC for the LIC shall be based on the costs of providing sample equipment for customers that provide their own sample collection.

EXHIBIT D

METHODS/OPERATING DOCUMENTS

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METHODS/OPERATING DOCUMENTS

1. INTRODUCTION

This AS01 Exhibit D contains specific procedural requirement for *General Sampling Activities*.

2. FIELD MEASUREMENT REQUIREMENTS

The subcontractor shall have equipment, standards, procedures and trained personnel to make the following field measurements when requested by the customer:

- Nitrate/nitrite
- conductivity
- pH
- temperature

2.1. **Method Sources:** Method requirements shall be consistent with those specified in *Methods for the Chemical Analysis of Water and Wastes* (EPA-600 Methods).

2.2. **Adherence to Cited Methods:** Methods cited above shall be followed without modification except where such changes are approved in writing by the CTR.

2.3. **Implementation of Method Updates:** Updates to cited methods shall be used by the subcontractor once the method is promulgated and approved for use by the Site. The CTR shall provide the sub-contractor with implementation dates for any new methods.

2.4. **Alternate Method Approval:** Any alternative method or modification/revision to standard methodology shall be approved in writing by the CTR prior to implementation and documented by the subcontractor.

3. SAMPLING REQUIREMENTS

3.1. Sampling Procedure for *General Sampling Activities*

The subcontractor shall develop and implement a procedure or procedures to provide step-by step instructions for all the *General Sampling Activities*. The SOP(s) shall include instructions, at a minimum, for sample collection, preservation, packaging, labeling, field measurements, and sample transfer. This procedure shall address concerns of sampling radioactive waste streams within Radiological Buffer Areas (RBAs) and other hazardous materials.

All sampling events performed by the sub-contractor at the Rocky Flats Environmental Technology Site shall conform to this procedure, another approved work control document or an approved Sample Analysis Plan.

This procedure shall provide for:

- 3.1.1. methods of collection and associated sampling equipment
- 3.1.2. equipment decontamination and disposal

- 3.1.3. sample container requirements, decontamination of containers
- 3.1.4. field equipment and measurements
- 3.1.5. sampling parameters
- 3.1.6. sample collection, bottling and preservation (if required)
- 3.1.7. sample and waste disposal
- 3.1.8. quality assurance/quality control
- 3.1.9. documentation and data management
- 3.1.10. health and safety Practices, required PPE
- 3.1.11. packaging and labeling requirements
- 3.1.12. proper application of Custody Seals
- 3.1.13. proper application of Tamper Indicating Devices
- 3.1.14. application and completion of Sample Labels
- 3.1.15. completion and Custody of the Chain-of-Custody Form
- 3.1.16. on-Site transfer of samples

4. SITE SPECIFIC DOCUMENTS

The following sections list SOPs and other operating documents necessary for the safe and successful completion of sampling activities:

4.1. MAN-T91-STSM-001, *SITE TRANSPORTATION SAFETY MANUAL (STSM)*

This STSM is the implementing document for the K-H Transportation Policy at the Site. This transportation Policy is consistent and complainant with DOE transportation Safety Policies, Transportation Orders, applicable Federal regulations and Site safety programmatic requirements. This manual is a Level I publication and applies to all aspects of the identification, handling, packaging, transfer and transporting of hazardous and radioactive materials at the Site and to all Rocky Flats employees. This manual also applies to Site contractors and subcontractors involved in transportation activities except where specific contract terms require compliance to another standard. The purpose of this manual is to implement the requirements of the Site Transportation Policy as related to On-Site transportation and Off-site transportation, which states:

- 4.1.1. All radioactive material, hazardous materials, hazardous substances, and hazardous waste shall be packaged, marked, labeled, handled and transported in approved containers using methods and procedures that will assure compliance with all applicable Site requirements and government regulations.
- 4.1.2. This manual establishes the requirements, objectives and authorities for the safe, secure and environmentally sound transportation of all hazardous and radioactive materials at the Rocky Flats Environmental Technology Site.
- 4.1.3. Furthermore, this manual established requirements for the identification, packaging, marking, labeling, handling and transporting of radioactive and nonradioactive hazardous materials at Rocky Flats.

- 4.1.4. The requirements established are based on current rules and regulations contained in the Federal Code of Regulations (CFR), Titles 10, 40 and 49, Code of Colorado Regulations (CCR), Title 6 and other applicable Department of Energy (DOE) orders.
- 4.1.5. The requirements established are such that personnel exposures and environmental impact as a result of transporting radioactive and other hazardous materials are maintained AS LOW AS REASONABLY ACHIEVABLE (ALARA) well below regulatory limits.

4.2. **PRO-908-ASD-004, ONSITE TRANSFER AND OFF-SITE SHIPMENT OF SAMPLES PROCEDURE**

This procedure is a Level I document that implements requirements of the STSM, and the K-H Analytical Services Division.

PRO-908-ASD-004, On-Site Transfer and Off-Site Shipment of Samples, implements the Kaiser-Hill on-site and off-site analytical sample transportation program at the Rocky Flats Environmental Technology Site (Site). This procedure provides the instructions for labeling, packaging, transferring, and shipping samples. This procedure is to be used in conjunction with an approved work-control document [e.g., a sampling procedure such as *CAS SOP-003*, Sampling for Waste Characterization for General Sampling Activities at RFETS, technical procedure, Integrated Work Control Program package, Operations Order, or Sampling and Analysis Plan].

The Kaiser-Hill on-site and off-site sample transportation program **SHALL** be implemented, as defined by this procedure, by all Site contractors, subcontractors, and any other agency representatives. This program is subject to the requirements of *MAN-T91-STSM-001*, Site Transportation Safety Manual (STSM), and *PRO-T95-OSTP-002*, Off-Site Transportation Procedure (OSTP).

This procedure begins when the samples have been placed into the sample transfer package and the sample transfer package has been prepared for on-site transfer. This procedure also provides prerequisite requirements for sample collection and the packaging prior to instruction for sample transfer.

This procedure provides instructions for on-site transfer and off-site shipment of samples. Samples that are less than Limited Quantity radioactive material values may be transferred by the Hand-Carry method and shipped by approved subcontractors. Samples that exceed Limited Quantity radioactive material values are transferred by the Site Transportation Department or Transportation Security Officers (TSOs). Samples that exceed Limited Quantity radioactive material values are shipped off-site by the Site Traffic Management Department.

Sample transfer and shipping activities at the Site **SHALL** be conducted in accordance with this procedure (*PRO-908-ASD-004*, "On-Site Transfer and Off-Site Shipment of Samples"). This procedure does not address shipments of waste or material that are not defined as samples by Department of Transportation (DOT) or Environmental Protection Agency (EPA) regulations.

This procedure is a new document, and the on-site transfer portion of this procedure replaces that of *4-T97-Traffic-112*, Sample Packaging and Transfer.

This procedure is written to comply with *MAN-001-SDRM*, Site Documents Requirements Manual, and is controlled through *MAN-063-DC*, Site Document Control Program Manual.

Other Site program manuals and facility procedures also implement Site infrastructure requirements. For example, transportation activities must also be conducted in compliance with radiological protection, nuclear safety, criticality safety, nuclear materials control, and security and safeguards programmatic requirements. The requirements of this procedure, in conjunction with other Site requirements, are designed to ensure the safe and effective conduct of Site sample-transportation activities. However, nothing in this procedure **SHALL** be interpreted to exempt any package or shipment from applicable DOT, EPA, tribal, state, or local regulation.

This procedure is used in conjunction with an applicable work-control document for sampling. The activities of this procedure begin after the sample has been placed into the sample transfer package (cooler, paint can, drum, etc.) and the sample transfer package has been prepared for on-site transfer. Personnel performing the activities within the scope of this procedure must have specific training. The requirements for packaging and transportation training are contained within Chapter X of the STSM.

There are three methods for transferring samples on-site: by hand-carry, by Site Transportation Department, and by Transportation Security Officers (TSOs). Hand-carry requirements are contained in Appendix 4 of the STSM. Hand-carry may include transfer within a vehicle, including on-site transfer of samples within a government or approved vehicle. Except for subcontractors whose contract requires the transport of hazardous material as part of the contract scope, Government-owned hazardous material is not transported in personal vehicles, including leased commercial vehicles. The Site Sample Team hand-carries samples.

Hazardous material samples are packaged in accordance with the requirements of the STSM. Radioactive materials are packaged in accordance with the requirements of the STSM or the *Site Radiological Control Manual (SRCM)*, as applicable. Radioactive material samples that exceed the Limited Quantity requirements in 49 CFR §173.421 are packaged in accordance with the requirements of the STSM and transported by the Site Transportation Department.

Classified materials, hazardous materials with extraordinary risk, and radioactive material that meet Safeguards Category 1 or 2 or quantities of Safeguards Category 3 or 4 that roll up to at least Category 2 for the load on the truck are transported by the TSOs.

Radioactive materials that are less than or do not exceed the Limited Quantity requirements in 49 CFR §173.421 are shipped off-site through an Analytical Services Division (ASD)-authorized sample shipper. The Site Traffic Management Department ships hazardous materials that present an extraordinary risk and radioactive materials that exceed Limited Quantities. Hazardous materials destined for off-site shipment are packaged in accordance with the applicable requirements of 49 CFR §171 through §178 and, if being shipped by air and required by the carrier, the International Air Transport Association (IATA) *Dangerous Goods Regulations (DGRs)*.

4.3. **PRO-543-ASD-002, INITIATION, PREPARATION, AND IMPLEMENTATION OF CHAIN-OF CUSTODY FORMS**

This procedure describes the instructions for completing the Sampling and Analysis Request Form (SARF) and the Chain-of-Custody Forms for WIPP and non-WIPP samples taken at the Rocky Flats Environmental Technology Site (Site).

A customer requiring analytical services (sampling and/or sample analysis) generates the SARF and submits it to the Analytical Services Division (ASD) for initiation of a Chain-of-Custody Form. Analytical Services Division (ASD) electronically generates a Chain-of-Custody Form on the Analytical Services Toolkit (AST) system for all sampling events initiated with a Sampling and Analysis Request Form.

The roles and responsibilities of those persons initiating these forms and those involved with the implementation of the Chain-of-Custody Form as a travel document accompanying samples are described within.

4.4. **1-P73-HSP-18.10, RADIOACTIVE MATERIAL TRANSFER AND UNRESTRICTED RELEASE OF PROPERTY AND WASTE**

This manual applies to all property or waste within the Rocky Flats Environmental Technology Site boundaries and to all persons, including DOE, contractors and sub-contractors who handle or are responsible for the radioactive material transfer or unrestricted release of property or waste within the Rocky Flats boundary.

This procedure provides the responsibilities, requirements and instructions regarding radioactive material transfer or unrestricted release of property and waste established by the following documents:

- Department of Energy (DOE) DOE/EH-0256T, Radiological and Control Manual (RCM)
- DOE Order 5400.5, Radiation Protection of the Public and Environment
- Rocky Flats Environmental Site Radiological Control Manual (Site RCM)
- Title 10, Code of Federal Regulations (CFR) 10 CFR 835, Occupational Radiation Protection
- 40 CFR 261, Identification and Listing of Hazardous Waste
- 49CFR 173, Subpart I, Radioactive Materials Transportation
- No Radioactivity Activity Waste (NRA) Verification Program

4.5. **NUCLEAR MATERIALS SAFETY MANUAL FOR INTRAPLANT SHIPMENT**

This manual consists of a compilation of nuclear materials safety limits for intraplant shipment. These limits are provided to assure safety in the criticality aspect of these shipments. These limits are provided to assure safety in the criticality aspect of these shipments and they are based on the latest data available. This manual addresses the following:

- 4.5.1. Limit of 200 grams of fissile material in any form per vehicle
- 4.5.2. Approved Shipping Containers are limited to a maximum size of a one gallon paint can
- 4.5.3. Arrangement in transport vehicle in a one layer planner array only

4.6. **DOE ORDER 5400.2, RADIATION PROTECTION OF THE PUBLIC AND THE ENVIRONMENT**

This DOE order establishes standards and requirements for operations of the Department of Energy and DOE contractors with respect to protection of members of the public and the environment against undue risk from radiation.

- 4.6.1. **Protecting the Public:** It is DOE's objective to operate its facilities and conduct its activities so that radiation exposures to members of the public are maintained within the limits established in this Order and to control radioactive contamination through the management of real and personal property. It is also a DOE objective that potential exposures to members of the public be as far below the limits as reasonably achievable (ALARA) and that DOE facilities have the capabilities, consistent with the types of operations conducted, to monitor routine and non-routine releases and to assess doses to members of the public.
- 4.6.2. **Protecting the Environment:** In addition to providing protection to members of the public, it is DOE's objective to protect the environment from radiation contamination to the extent practicable.

4.7. **CODE OF FEDERAL REGULATIONS (CFR) 49, TRANSPORTATION, 173.401, RADIOACTIVE MATERIAL**

The CFR is a codification of the general and permanent rules published in the Federal Register by the Executive departments and agencies of the Federal Government.

This subpart sets forth requirements for the transportation of radioactive materials by carriers and shippers subject to this subchapter. The requirements prescribed in this subpart are in addition to, but not in lieu of, other requirements set forth in this subchapter and in 10 CFR part 71 for the packaging and transportation of radioactive materials.

EXHIBIT E

QUALITY ASSURANCE/QUALITY CONTROL

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QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

1. INTRODUCTION

The purpose of this AS01 Exhibit E is to describe the minimum QA/QC requirements necessary to satisfy the deliverable and data requirements associated with sampling, field analyses, and transferring samples On-Site. These requirements are designed to implement systems to ensure that all samples and information generated from sampling events for this SOW assure that the precision, accuracy, completeness and traceability of each sample collected is known and documented. These requirements do not release the subcontractor from maintaining their own specific QC checks on their methods. Evidence that the implementation of QA/QC program requirements fail to control activities that could have an impact on the validity of samples and information or that established program requirements are not being followed may result in a **SUBCONTRACT TERMINATION**.

2. THE QUALITY ASSURANCE PROGRAM

2.1. **QA/QC Components:** The subcontractor shall establish a QA Program which shall incorporate a QA Plan, QC procedures, corrective action systems, and documentation required during sampling, field analyses, and transferring samples On-Site. Some QA Program requirements are summarized in Table E-1. The *Reference* column refers to the document, an AS01 Exhibit and Section number, and/or title, where more details may be found. This *Reference* column is intended as an aid in locating requirements, but is not expected to be all-inclusive.

TABLE E-1 QA PROGRAM REQUIREMENTS SUMMARY

Requirements	Reference Exhibit/Section
Development and implementation of a QA Program and documentation of the key elements of that QA Program through a written QA Plan	Exhibit E Sections 3
Preparation of and adherence to written SOPs	Exhibit E Section 3 Exhibit F Section 5
Adherence to the specific procedures and associated QC, and data management requirements provided in AS01	Exhibit D, and Exhibit E Sections 7 and 8
Assurance that requirements are met for Measuring and Testing Equipment, and Standards and Reagents.	Exhibit E Sections 5 and 6
Adherence to corrective action procedures	Exhibit E Sections 9 and 10
Participation in external assessments (e.g. Analytical Services and Radiological Safety personnel), completion of internal self assessments, and adherence to corrective action procedures	Exhibit E Sections 9 and 10
Submission of all raw data and pertinent documentation	Exhibit B/Section 4
Compliance with Performance Criteria	Exhibit E Section 11

3. QUALITY ASSURANCE PLANS

- 3.1. **Schedules:** The subcontractor shall implement and maintain a written QA Plan that presents the policies, organization, objectives, and specific QA and QC activities designed to achieve the deliverable and data quality requirements of this SOW as they pertain to all sampling activities, field analyses, and transfer of samples. The subcontractor shall provide the CTR with a copy of the QA Plan prior to the time of contract award. Changes to the QA Plan shall be submitted to the CTR prior to implementation.
- 3.2. **QA Plan Review:** The status and adequacy of the QA Plan shall be reviewed and approved once a year by the subcontractor management. This documentation shall be incorporated into each SOP. Also a system shall be developed and maintained to promote continuous quality improvement, including an internal assessment program.
- 3.3. **QA Training:** The subcontractor personnel shall receive QA training appropriate to their participation. Training shall be performed as necessary to assure that each staff member understands the QA and technical requirements applicable to their work. Documentation of training, whether function specific or general, shall be maintained by the subcontractor and be available upon CTR request and during audits.
- 3.4. **References:** The QA Plan shall be based on one or more of the following references: 10 CFR 830.10, DOE Order 414.1, ANSI/ASQC E4-1994, ASME-NQA-1-1989, ISO 9000, and/or Good Laboratory Practice Standards (40 CFR 792). Additional information relevant to the preparation of a QA Plan can be found in DOE, EPA, and ASTM publications.
- 3.5. **QA/QC Plan Key Elements:** The QA/QC Plan shall address all *Key Elements* listed below. Requirements associated with these *Key Elements* are found in this Exhibit and the references cited in the previous paragraph. Where procedures, requirements, responsibilities and documentations are indicated below, the QA/QC Plan shall include these in the QA/QC Plan or by reference to QA/QC SOPs.
 - 3.5.1. **Subcontractor QA/QC Policy and Objectives**
 - 3.5.2. **Organization and Personnel**
 - 3.5.2.1. Staff resumes of *Key Personnel*.
 - 3.5.2.2. Education and experience requirements
 - 3.5.2.3. Indoctrination and training procedures and requirements
 - 3.5.2.4. QA/QC management organization
 - 3.5.2.5. Assignment of QA and QC responsibilities
 - 3.5.2.6. QA/QC management reporting relationships
 - 3.5.3. **Facilities, Equipment and Materials**
 - 3.5.3.1. Guidance for measuring and test equipment calibrations
 - 3.5.3.2. Procedures for maintaining measurement system stability and reproducibility

- 3.5.3.3. Maintenance activities and schedules
- 3.5.3.4. Instrumentation and backup alternatives
- 3.5.3.5. QC program for confirmation of materials (e.g., standards, reagents, sample bottles, etc.)
- 3.5.3.6. QC program for control of age-sensitive materials
- 3.5.3.7. QC program for reference material analysis/verification
- 3.5.4. **Control of Purchased Items and Services**
 - 3.5.4.1. Criteria for approving vendors
 - 3.5.4.2. Requirements for assuring procurements identify or reference quality criteria
 - 3.5.4.3. Procedures for acceptance of purchased items
- 3.5.5. **Procedures and Document Control**
 - 3.5.5.1. All work shall be conducted in accordance to written procedures
 - 3.5.5.2. Procedures for measurement process documentation
 - 3.5.5.3. Sample tracking/custody procedures and documentation requirements
 - 3.5.5.4. Logbook content, format, maintenance, and archiving
 - 3.5.5.5. RIN file organization, preparation, and review procedures
 - 3.5.5.6. Computer and Program Security Procedures
 - 3.5.5.7. Procedures for preparation, approval, review, revision, and control of SOP distribution
- 3.5.6. **Sample Collection, Data Generation, and Sample Handling Procedures**
 - 3.5.6.1. Adherence to specific Sample collection procedures and requirements of this SOW
 - 3.5.6.2. Sample preservation, packaging, labeling and transferring procedures
 - 3.5.6.3. Standard and QC sample preparation procedures
 - 3.5.6.4. Calibration procedure and frequency
 - 3.5.6.5. Field determination procedure
 - 3.5.6.6. Data collection procedure
 - 3.5.6.7. Data review procedure
 - 3.5.6.8. Data reporting and authorization procedure
 - 3.5.6.9. Data management procedure
 - 3.5.6.10. AST Data management procedure
- 3.5.7. **Assessment Program**
 - 3.5.7.1. Participation in External Assessments
 - 3.5.7.2. Internal Assessment Program
- 3.5.8. **Nonconformance Program**

3.5.8.1. Corrective action procedures

3.5.8.2. Control of nonconformances

4. PERSONNEL

4.1. QA Personnel

4.1.1. QA personnel shall operate independently from cost and schedule considerations and shall have the responsibility and authority to stop unsatisfactory work.

4.2. Personnel Certification

4.2.1. Procedures shall be in place for the establishment and implementation of a certification program for the indoctrination and training of subcontractor personnel performing sampling activities under this SOW. This program must define how sufficient sampling activity proficiency is defined, achieved, maintained, and documented to safely achieve completion of all sampling events.

4.2.2. Subcontractor personnel who have not passed certification to perform sampling activities shall not be allowed to conduct sampling activities under this SOW. The certification documentation shall be maintained by the subcontractor and be available during on-site inspections and upon CTR request.

4.2.3. Subcontractor personnel shall be certified annually.

5. MEASURING AND TESTING EQUIPMENT (M&TE)

5.1. **General Requirements for M&TE:** The subcontractor shall establish and document calibration methods and intervals for M&TE. M&TE shall include analytical instruments, balances, thermometers, pipettes and other devices used in the generation of field parameter results and to demonstrate compliance to procedural requirements. In addition, requirements for M&TE apply to equipment used to demonstrate other aspects of conformance to this contract, such as preservation of samples destined for the laboratory for analyses.

5.1.1. M&TE shall include balances, thermometers, pipettes and other devices used to generate Field data, and to demonstrate compliance to SOW requirements, such as preservation of samples at 4° C, and determination conductivity.

5.1.2. The subcontractor shall establish and document calibration methods and intervals for M&TE.

5.1.3. The subcontractor shall assign unique identifiers to all M&TE.

5.1.4. All data generated by M&TE must be labeled with the unique M&TE identifier.

5.1.5. The subcontractor shall maintain records (and if applicable, mark equipment) indicating calibration status. Records shall include the unique equipment identifier, calibration interval, traceable standard identifiers, chronological equipment condition history, and the personnel performing the calibration.

5.1.6. The subcontractor shall establish a system to identify and prevent the use of M&TE that do not meet performance standards. Failure to meet standards may be due to M&TE that

are out-of-calibration, are under expired certification status, or exhibit conditions indicating compromised performance.

5.2. **Instrument Maintenance, Repair, Configuration**

- 5.2.1. The subcontractor shall document all maintenance and repairs on instrumentation, including date of maintenance/repair and personnel performing the task.
- 5.2.2. The subcontractor shall develop preventive maintenance schedules in accordance with instrument manufacturer recommendations.
- 5.2.3. Any repair, reconfiguration, or replacement of an instrument component shall be followed by verification of the calibration of the system. If the calibration verification parameters are not met, an appropriate calibration shall be performed. If instrument components are changed, the subcontractor shall also verify and report instrument parameters as specified in Exhibit B of this module.
- 5.2.4. Instrument maintenance/repair documentation shall be maintained by the subcontractor and be available upon request and during on-site audits.

5.3. **Thermometers and Temperature Recording Devices**

- 5.3.1. Liquid-in-glass thermometers shall be calibrated against an NIST traceable standard at a five-year interval.
- 5.3.2. Liquid-in-glass thermometers shall be inspected annually for conditions that may degrade performance. At a minimum, this inspection must include examination for evidence of liquid column separation and evidence of other conditions that might affect the column.
- 5.3.3. Thermometer and temperature device certifications and documentation of annual inspections shall be maintained by the subcontractor and made available upon request of the CTR and during on-site audits.

5.4. **Refrigerators**

- 5.4.1. The temperature of refrigerators used to store Site samples shall be verified and documented every working day. Documentation shall be maintained by the subcontractor and available upon request and during on-site audits.
- 5.4.2. The subcontractor shall develop and implement procedures for sample storage and preservation in the event of a refrigerator failure or power failure.
- 5.4.3. The subcontractor shall clearly identify refrigerators exceeding temperature requirements to prevent use until corrective actions have been completed.

5.5. Automatic Pipettes and Dispensers

- 5.5.1. The subcontractor shall calibrate all non-Class A pipettes and automatic sample dispensers used for quantitative measurement. This calibration shall be performed monthly or whenever degradation of measuring equipment performance is suspected, whichever is more frequent. Conditions that may initiate immediate recalibration include: evidence of corrosion, leakage, movement of continuously-adjustable volume settings, and improper treatment such as dropping and exposure to nonroutine temperatures.
- 5.5.2. Pipette and automatic sample dispenser calibration documentation shall be maintained by the subcontractor and be available upon request by the CTR and during on-site audits.

5.6. Balances

- 5.6.1. Balances shall be located in a vibration-free environment away from drafts and rapid temperature changes.
- 5.6.2. All balances shall be calibrated and labeled annually by a certified technician.
- 5.6.3. Working weights used for daily balance verifications shall be certified annually.
- 5.6.4. The type, grade, and class of weights used to calibrate balances for analytical measurements shall meet the requirements of ASTM E 617, *Laboratory Weights and Precision Mass Standards*.
- 5.6.5. Daily Balance Verification Requirements
 - 5.6.5.1. The subcontractor shall check weigh the balance, at a minimum, every working day per use.
 - 5.6.5.2. Check weighing shall be performed at two (2) points within the balance range using certified working weights
 - 5.6.5.3. Results of check weight measurements shall be documented by the subcontractor. Documentation of check weight measurements shall be maintained by the subcontractor and be available for review during an on-site assessment and within seven calendar days of CTR request.
- 5.6.6. Check weight and balance certifications shall be maintained by the subcontractor and be available upon CTR request and during on-site audits.

6. STANDARDS AND REAGENTS

This Section primarily contains acquisition, maintenance, and documentation requirements for standards, reagents, and QC samples.

6.1. Reagent Water

- 6.1.1. The subcontractor shall have a water system or access to a water system capable of providing laboratory water meeting the American Society for Testing and Materials (ASTM) specifications for Type II water (ASTM D1193).
- 6.1.2. The water system shall be monitored with each use. Results of this monitoring shall be recorded at least once each day the system is in use. The conductivity shall not exceed 1.0 $\mu\text{S}/\text{cm}$ at 25° C (i.e., the resistivity shall be greater than 1.0 $\text{M}\Omega \text{ cm}$ at 25° C). If this

level is exceeded, the subcontractor shall take immediate corrective action before the water can be used for sample determinations under this SOW. Monitoring and corrective action documentation shall be maintained by the subcontractor and available upon request by the CTR and during on-site audits.

6.2. **Purchase of Analytical Reagents**

- 6.2.1. The subcontractor shall have a documented program for controlling the quality of purchased reagents.
- 6.2.2. The subcontractor shall have an established system for approving vendors to procure supplies and services. All analytical reagents shall be obtained from these approved vendors.
- 6.2.3. Material Safety Data Sheets (MSDSs) shall be maintained by the subcontractor and also submitted to the CTR.

6.3. **Documentation of the Verification of Chemical Reagents**

- 6.3.1. The subcontractor shall maintain the necessary documentation to show that the reagents used in the performance of field determinations conform to requirements. Supporting documentation such as standard logs shall be maintained by the subcontractor and may be subject to review during on-site audits.

6.4. **Labeling Reagents**

- 6.4.1. The subcontractor shall label all purchased reagents with the following information:
 - Date received
 - Date opened (Required when used to establish expiration date)
 - Expiration date

6.5. **Expiration Dates for Reagents**

- 6.5.1. Expiration dates established by the manufacturer shall be used when available. The subcontractor shall not use reagents beyond the expiration date provided by the manufacturer.
- 6.5.2. If an expiration date is not defined, the subcontractor shall document how the shelf life of the reagent is determined.
- 6.5.3. The expiration date (manufacturer or laboratory established), date received, and date opened shall be clearly identified on all reagent solution containers. If an expiration date is not required, it shall be indicated on the container.

7. **METHOD SPECIFIC QC REQUIREMENTS**

- 7.1. The subcontractor shall complete and identify field, trip, and equipment blanks as per the Sampling and Analysis Plan or the required Federal/State Regulations. Identification of the QC samples shall be submitted to Analytical Services within 24 hours of sampling.
- 7.2. The subcontractor shall use equivalent media (e.g., reagent water as defined in Section 6.1) for preparing field blanks. The blank medium shall not contain any of the target parameters.

8. DATA MANAGEMENT

- 8.1. The subcontractor shall conduct all data management activities in accordance with documented QA/QC procedures that include review by a second person.
- 8.2. Verification of AST data entry shall include all entrees, updates, corrections, and deletions. Verification shall also include verification that information was saved and printed to hardcopies without errors.
- 8.3. Exhibit F contains procedural requirements for data management and software QA.
- 8.4. All data for Incidental Waters is entered on hardcopy of the Request for Incidental Water (IW) Analysis form. This original form is photocopied, a copy is sent to the customer, a copy filed by the subcontractor, and the original submitted to ASD or designee for filing.
- 8.5. For samples other than IW samples requiring field determinations, the data shall be entered on the Sample Worksheet that shall be submitted to ASD or designee.

9. ASSESSMENTS

- 9.1. **External Assessments:** The subcontractor shall be subject to routine and non-routine assessments or audits with follow-up assessments of either type. The subcontractor shall make all requested data and documentation related to this SOW available during assessments.
 - 9.1.1. **Routine Assessments:** A routine assessment may be a comprehensive audit or limited scope audit performed by ASD or it's designated subcontractor to verify adherence to the ASD SOW and the subcontractor's SOP requirements. The subcontractor shall be subject to routine on-site assessments not more than two times per calendar year during performance of this SOW. Written notification shall be provided to the subcontractor for routine assessments.
 - 9.1.2. **Non-routine Assessments:** A non-routine assessment may be a comprehensive audit or limited scope audit performed by DOE, the DOE primary contractor or it's designated subcontractor to verify adherence to DOE orders, the ASD SOW and the subcontractor's SOP requirements. The subcontractor shall be subject to non-routine on-site assessments whenever requested. These may be unannounced and announced assessments that may be performed at any time during the subcontract period.
 - 9.1.3. **Follow-up Assessments:** A follow-up assessment verifies that adequate corrective action has been implemented by the subcontractor in response to a previous assessment finding, that SOW requirements are met when the scope of the SOW changes or when the subcontractor relocates. Follow-up assessments will normally be performed 30 days following the implementation of a corrective action or a change in the SOW or SOP. However, on-site assessments for the purpose of identifying and resolving deficiencies or verifying corrective actions may be performed at any time during performance of the subcontract.
 - 9.1.4. **Corrective Actions and Audit Response Reports:** Following an external assessment, the assessment team will conduct a closing conference with subcontractor

staff to discuss identified findings and establish a schedule for corrective action. The subcontractor shall perform Corrective Actions to resolve the findings identified during the external assessment according to the schedule set during the closing conference. The subcontractor shall also issue an Audit Response Report for the Findings and Corrective Actions that were taken or are to be taken. Failure to meet the established timeline for responding to the identified findings and/or failure to meet the established corrective action schedule may result in subcontract termination.

9.2. **Internal Self Assessment Program**

- 9.2.1. The subcontractor shall implement and maintain an internal self-assessment program. Each self-assessment may be of limited scope, however the assessment program shall address all procedures and operations, which includes corrective action procedures.
- 9.2.2. Internal self-assessments shall be conducted at a frequency of at least quarterly.
- 9.2.3. Personnel knowledgeable of, but independent from, the operations performed shall conduct internal self-assessments, if possible.
- 9.2.4. Internal self-assessments should be conducted in accordance with written procedures and/or checklists. Self-assessment reports shall identify the assessors, personnel interviewed during the assessment, a synopsis of the assessment scope, and a summary of the final results in sufficient detail to enable corrective action.
- 9.2.5. **Corrective Actions and Audit Response Reports:** Following an internal self assessment, the inspection team will conduct a closing conference with other subcontractor staff to discuss identified deficiencies and establish a schedule for corrective action. The subcontractor shall perform Corrective Actions to resolve the findings identified during the internal self-assessment according to the established schedule. The subcontractor shall also issue initial Corrective Actions for the Corrective Actions that were taken or are to be taken within 2 weeks of the audit close out conference. A copy of the internal self-assessment Audit Response Report shall be provided to the CTR for evaluation and approval. The subcontractor shall complete all Corrective Actions and a final Audit Response Report by a date that is approved by the CTR.

10. **NONCONFORMANCES**

- 10.1. Nonconformances and Corrective Actions must be identified, documented, tracked, evaluated, and resolved. Conditions adverse to safety and quality shall be promptly identified and corrected.
- 10.2. Nonconforming items (e.g., expired standards) shall be identified, tagged and/or segregated until disposition.
- 10.3. The identification of adverse conditions and corrective actions shall be documented and reported to subcontractor management and the CTR.
- 10.4. The subcontractor shall implement a corrective action tracking system to ensure follow-up actions are taken to confirm and document corrective action implementation.

11. PERFORMANCE CRITERIA

- 11.1. **Monitoring Performance:** Subcontractor performance will be continually assessed by the CTR. The general areas of performance that are to be monitored include: safety, sample turnaround time from sample receipt to sample shipment, accuracy and timeliness of data entry, and compliance to deliverable requirements.
- 11.2. **Deliverable Expectations:** The subcontractor shall meet the delivery schedules outlined in Exhibit B Table B1 of this SOW.
- 11.3. **Sample Turn-Around-Time:** The subcontractor shall meet the requirements for sample TATs as outlined in Exhibit A Table A1 of this SOW.
- 11.4. **Data Entry and Accuracy:** The subcontractor shall meet the Analytical Services Toolkit (AST) tracking system data entry requirements as defined in Exhibit D. A 95% accuracy is required.

EXHIBIT F

EVIDENTIARY REQUIREMENTS

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EVIDENTIARY REQUIREMENTS

1. INTRODUCTION

This AS01 Exhibit describes the evidentiary requirements that must be followed for sample collecting, sample labeling, sample packaging, and sample transferring, including requirements for sample Chain of Custody (COC), Standard Operating Procedures, and other operating documents and manuals. The subcontractor is required to be familiar with these to ensure the safe and successful completion of each sampling project.

2. SAMPLE CHAIN OF CUSTODY (COC)

Samples and Chain-of-Custody Forms are physical evidence that must be controlled and legally defensible, whether samples are collected for waste characterization or for the determination of exposure to radioactive materials or hazardous constituents. To accomplish this, the subcontractor shall implement the following sample control and Chain-of-Custody (COC) requirements. Evidence that samples are NOT identifiable and traceable at all stages can result in data that is NOT legally defensible and may result in subcontract termination.

2.1. Sample Identification

- 2.1.1. The subcontractor shall assure traceability of samples in their possession; the subcontractor shall follow a specified method for maintaining identification of samples from sample collection to the time the samples are relinquished.
- 2.1.2. Each sample shall be labeled with the Site Report Identification Number (RIN) and the Site sample number.

2.2. **Chain-of-Custody and Sample Tracking Requirements:** The subcontractor shall maintain a traceable COC for samples from sample collection to the time the samples are relinquished. The subcontractor shall have procedures ensuring that sample custody is maintained and documented.

- 2.2.1. A sample is under custody if any of the following applies:
 - 2.2.1.1. It is in your possession;
 - 2.2.1.2. It is in your view after being in your possession; or
 - 2.2.1.3. It was in your possession and you locked it up
- 2.2.2. The subcontractor shall maintain records documenting sample pickup and relinquishment to the designated recipient. This documentation shall be available upon request and during On-Site assessments. The records shall include documentation of the movement of samples into and out of designated storage areas.
- 2.2.3. COC documents shall demonstrate the location of the sample at all times. The COC documents shall show transfer of the sample between individuals, and into and out of the secure areas. Internal COC records shall include the name of the person in possession, the date, and the time of transfer.
- 2.2.4. COC documentation shall be completed in accordance with RFETS procedure PRO-543-ASD-002, *Initiation, Preparation, and Implementation of Chain-Of-Custody*.

- 2.2.5. The subcontractor shall maintain subcontractor copies of COC records documenting the handling of samples from collection to relinquishment.
- 2.2.6. The subcontractor shall submit copies of COCs to the ASD or designee as directed by the CTR following collection and/or transfer of samples to a laboratory.

2.3. **Sample Protection and Integrity**

- 2.3.1. The subcontractor shall ensure that security is maintained in all handling areas and shall ensure that samples are protected from accidental damage, theft, or malicious mischief. The subcontractor shall provide immediate verbal notification to the CTR followed by email notification of any losses or damage within 24 hours. The subcontractor shall also provide a formal written report with a corrective action plan when requested by the CTR. In addition, the subcontractor shall identify and document which individuals have access to secure areas. Procedures and documentation for access shall be available for review during On-Site inspections and upon written request from the CTR.
- 2.3.2. Sample shipments require custody seals on the containers placed such that they cannot be opened without damaging or breaking the seal.
- 2.3.3. Custody of the COC shall be maintained at all times. If the COC is not in the custody of the samplers or transporters, the COC shall be sealed within the sample packaging with a custody seal.

3. **DOCUMENT CONTROL REQUIREMENTS**

The goal of the subcontractor document control program is to assure that all documents will be accounted for when the subcontractor completes the sampling project and that meaningful information can be extracted from these documents when retrieved. Accountable documents used by the subcontractor shall include (but shall not be limited to) logbooks, COC records, ASD Sampling Worksheet, and other documents relating to sample collection, field analyses and transfer of samples. Document control procedures shall be established to assure that all records related to Site sampling activities are properly maintained.

3.1. **General Requirements**

- 3.1.1. All documents and required retention copies shall be complete and legible.
- 3.1.2. All observations and results recorded by the subcontractor shall be on pre-printed forms or shall be entered into permanent laboratory logbooks.
- 3.1.3. The subcontractor name and a descriptive form name shall be included on all documents used to record information related to Site sampling activities.
- 3.1.4. Unused portions of documents shall be Z'd out, initialed, and dated in black or blue indelible ink.
- 3.1.5. All records shall be maintained in black or blue indelible ink.
- 3.1.6. When columns are used to organize information recorded on subcontractor records such as pre-printed forms or logbook pages, the information recorded in that column shall be identified in a column heading.
- 3.1.7. Any sampling or sample transfer documentation that is not a part of other deliverable items shall be available during assessments and upon request.

- 3.1.8. QC sample identification on all documentation shall unequivocally denote the QC type either through the identifier or by cross-referencing the identifier with the QC type. QC identifiers shall be unique.
- 3.1.9. Sample documentation must include all Site Sample Identifiers.
- 3.1.10. The identification scheme used must provide an unequivocal and unique link between the samples and QC samples in a RIN.
- 3.1.11. To preserve confidentiality, references to the Site shall not appear in any documents accessible to non-sampling personnel. Any sample handling documentation that is not a part of other deliverable items shall be available during audits and upon request.
- 3.1.12. Field measurement data must be labeled with RIN or with other identifiers.
- 3.1.13. Applicable units shall accompany all numerical data.
- 3.2. **Error Correction:** Corrections and updates to supporting documentation shall be performed in a manner that preserves record integrity. The following procedures must be followed when correcting errors:
 - 3.2.1. A single line shall be drawn through the error and the correct information recorded in black or blue ink.
 - 3.2.2. No information shall be obliterated or made unreadable.
 - 3.2.3. All corrections, additions, and crossed out information shall be initialed and dated in black or blue ink.
 - 3.2.4. Use of correction fluid is prohibited.
- 3.3. **Requirements for Logbooks**
 - 3.3.1. The subcontractor name, address and a unique logbook identifier shall appear on the cover of all logbooks. The type of activity recorded within a logbook shall be on the cover of the logbook.
 - 3.3.2. Pages in both bound and unbound logbooks shall be sequentially numbered.
 - 3.3.3. Logbook entries shall be dated (month/day/year) and signed by the person responsible for performing the activity at the time an activity is performed.
 - 3.3.4. Logbook entries shall be in chronological order.
- 3.4. **Requirements for Preprinted Forms:** Preprinted forms shall contain the name of the subcontractor, revision date (month/day/year), and signature of the person responsible for performing the sampling activity at the time the activity is performed.
- 3.5. **Review of Field Measurements:**
 - 3.5.1. Before releasing results for field measurements, the a subcontractor manager shall cross-check the information on custody records, instrument logs, and other relevant records. This check shall be documented with a signature and date on the Field measurements worksheet.

3.6. **Document Numbering and Inventory Procedures**

- 3.6.1. All documents relevant to each RIN shall be inventoried.
- 3.6.2. The Site Manager shall be responsible for ensuring that all documents generated are placed for inventory and are maintained at the subcontractor onsite facilities and are available for reproduction or review during on-site audits.

3.7. **Storage of Site Files**

- 3.7.1. The subcontractor shall maintain Site documents in a secure location that is protected from damage and deterioration.
- 3.7.2. The subcontractor shall maintain written records and documents to be used as evidence for each sampling activity. Documents and records maintained by the subcontractor shall be legible, identifiable, and retrievable.

3.8. **Document Retention:** Documentation and records generated by the subcontractor shall be retained by the subcontractor for a period of five calendar years. After this period, records may be disposed of with the following provisions:

- 3.8.1. Six months prior to the date the subcontractor intends to dispose of documentation and records related to Site sampling activities, the subcontractor shall notify the CTR or designated representative in writing. Written approval must be obtained from the CTR prior to the disposition of documents and records.
- 3.8.2. The Site retains the right to request physical reproduction of the documentation and records by the subcontractor at any time during the retention period.

3.9. **Documentation of Sample Shipment**

- 3.9.1. The subcontractor shall document collection and transfer of samples to on-Site locations on the COC and in AST. The subcontractor shall document what was collected and transferred, to whom, and the date. A weekly report shall be submitted as defined in Exhibit B.

3.10. **Corrections and Updates to Submitted Deliverables:** The record of changes as corrections and updates to information originally generated, submitted, and/or resubmitted shall be documented to allow traceability of updates. Documentation shall include the following for each change:

- 3.10.1. Justification or rationale for the change.
- 3.10.2. Initials of the person making the change or changes with the date of the change or an effective date of implementation. Changes shall be reviewed and documented by a person or group independent of the source generating the deliverable.
- 3.10.3. Change documentation shall be retained according to the schedule of the original deliverable.
- 3.10.4. Resubmitted deliverables shall be reevaluated as a part of the subcontractor's internal assessment process prior to resubmission. The entire deliverable, not just the changes, shall be assessed.

4. STANDARD OPERATING PROCEDURES (SOPS)

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 information produced and activities performed under this SOW are acceptable.

4.1. **The Subcontractor SOP Program:** The subcontractor shall establish and implement a system that defines when a SOP is required, and the process by which a SOP is created, reviewed, approved, controlled, updated, and retained. At a minimum, this system shall define, establish, and implement the following:

- 4.1.1. **Document Control:** A document control process shall be established to maintain control of all SOPs. A document shall record the SOP title, unique SOP identifier, current revision, custodian, and controlled copy number of each SOP. The process shall insure that procedures are approved for release only by authorized personnel. Document control procedures shall be designed to preclude the use of outdated or inappropriate SOPs and insure that outdated or uncontrolled SOPs shall not be in the possession of subcontractor personnel.
- 4.1.2. **Interim Change:** A document control process shall be established to formally implement changes on an interim basis until the changes can be incorporated into a revised SOP.
- 4.1.3. **Periodic SOP Review:** SOPs shall be reviewed annually and updated as necessary when subcontract, facility, or subcontractor procedural modifications are made.
- 4.1.4. **Document Retention:** Current SOPs and superseded revisions of SOPs shall be retained as accountable documents by the subcontractor as described in Exhibit F Section 3.
- 4.1.5. **Document Availability:** Current SOPs shall be available at the sampling Site as appropriate. A complete set of SOPs shall be available during an external assessment. During an external assessment, subcontractor personnel may be asked to demonstrate the application of the SOPs.
- 4.1.6. **Format and Content Requirements:** The format for SOPs may vary depending upon the kind of activity for which they are prepared. However, at a minimum, SOPs shall accurately describe the activity as performed by the subcontractor and include QC criteria and corrective action procedures. Additional content requirements follow.

4.2. SOP Delivery Requirements

- 4.2.1. The subcontractor shall provide a complete list of all current SOPs relevant to this SOW to the CTR. The list shall include procedure identifier, title, and effective date.
- 4.2.2. The CTR may request a copy of any SOP selected from this list. The subcontractor shall deliver to the CTR a copy of the requested SOP within three calendar days of the request.
- 4.2.3. During the term of performance of the subcontract, the subcontractor shall notify the CTR, in writing, of new or amended SOPs applicable to this SOW prior to implementation of the change. This notification shall identify the new or amended SOP(s) and include a revised SOP list. In the case of updated SOPs, a brief description of the change shall be included.

- 4.3. **Common SOP Requirements:** All SOPs shall:
- 4.3.1. Be functional (i.e., clear, comprehensive, up-to-date, and sufficiently detailed) to permit duplication of activities by all trained personnel.
 - 4.3.2. Describe actual processes as performed by the subcontractor.
 - 4.3.3. Include QC criteria and corrective action procedures
 - 4.3.4. Be consistent with current DOE and DOT regulations, other Federal regulations, State regulations, Site requirements, and AS01 Module requirements.
 - 4.3.5. Provide a system to sufficiently and completely document the necessary actions and performance of each task.
- 4.4. **Requirements for Evidentiary SOPs:** The subcontractor shall develop and use a SOP or SOPs to ensure sampling, field measurements, sample transfers and information meet all requirements and are consistent. Evidentiary SOPs shall include specific procedures as the subcontractor performs them for the following processes:
- 4.4.1. **Sampling Activities:** The subcontractor shall have a written SOP or SOPs sampling, field measurements, sample transfers and documentation of all sample types. At a minimum, a SOP shall describe the system and tasks performed to ensure compliance of sampling, field measurements, sample transfers and information requirements of this AS01 module or SOW. The SOP(s) shall:
 - 4.4.1.1. be consistent with instrument manufacturer's specific instruction manuals.
 - 4.4.1.2. provide for the development of documentation that is sufficiently complete to record the performance of all tasks required by the protocol.
 - 4.4.1.3. describe the mechanism for demonstrating the validity of field data reported and explain the action taken for missing or inconsistent results.
 - 4.4.1.4. describe the corrective measures and feedback mechanism used when field data results do not meet protocol requirements
 - 4.4.1.5. include steps required to perform a sampling event, reference to a standard published method is not an acceptable substitute for SOP steps
 - 4.4.1.6. include examples of documents, forms, and logbook formats used to document activities
 - 4.4.1.7. address procedures to prevent sample contamination during sample collecting.
 - 4.4.1.8. address equipment maintenance and calibration
 - 4.4.1.9. describe standard and reagent purchase, receipt, storage, preparation, inventory control, traceability, and disposal of outdated standards
 - 4.4.2. **Sample Identification:** The subcontractor shall have a written SOP describing steps taken to ensure compliance of Sample Identification Requirements of this AS01 module or SOW.
 - 4.4.3. **Sample Security, Integrity and Custody:** The subcontractor shall have a written SOP or SOPs to ensure sample security, integrity and chain-of-custody. At a minimum, a procedure shall describe the systems and tasks that are to be performed to ensure

compliance of sample security, integrity, and custody requirements of this AS01 module or SOW.

- 4.4.4. **Document and Information Control:** The subcontractor shall have a written SOP or SOPs to ensure document and information control. At a minimum, a procedure shall describe the systems and tasks that are to be performed to ensure compliance for document and information control requirements of this AS01 module or SOW.
- 4.4.5. **Waste Management**
 - 4.4.5.1. The subcontractor shall have a written SOP for waste management that includes the handling and tracking of samples requiring disposition.
 - 4.4.5.2. The subcontractor shall have a written SOP for management of waste generated as a result of a leaking or spilled sample.
 - 4.4.5.3. The subcontractor shall have a written SOP for management of waste generated during the handling of QC samples.
- 4.4.6. **Hazard Awareness:** The subcontractor shall have written within operational SOPs hazard awareness checks which cover all aspects of sample collection, measurement and transfer.
- 4.5. **Requirements for Quality Management SOPs:** The subcontractor shall have written SOPs for technical and managerial review of subcontractor operations, information review, and self-assessment systems. At a minimum procedures shall document the following information:
 - 4.5.1. Information flow and chain-of-command for information review
 - 4.5.2. Procedures to assure that hardcopy deliverables are complete and compliant with the requirements in Exhibit B
 - 4.5.3. Procedures to assure that data entry into the AST tracking system is complete and compliant with the requirements in this SOW
 - 4.5.4. Demonstration of internal QA assessment procedure
 - 4.5.5. Frequency and type of internal self assessments (e.g., random, quarterly, spot checks, perceived trouble areas)
 - 4.5.6. Demonstration of problem identification-corrective actions and the sequence resulting from internal self assessments (i.e., QA feedback)
 - 4.5.7. Documentation of assessment reports (internal and external), subcontractor responses to assessment reports, and corrective actions taken to correct identified findings or deficiencies
 - 4.5.8. Tracking nonconforming items for implementing corrective action procedures
 - 4.5.9. Evaluation of nonconformance items for identifying systematic errors
- 4.6. **Requirements for Document Organization SOPs:** The subcontractor shall have written SOPs for the organization and assembly of all documents relating to this SOW. The procedures shall ensure that all document assembly and organization requirements of Exhibits B, E, and F are specified. The system shall include a document numbering and inventory procedure, a description of the method used by the subcontractor to verify consistency and completeness of deliverables and procedures for the submittal of the deliverables.

- 4.7. **Requirements for Data Management SOPs:** The subcontractor shall have written SOPs for the management, handling, and reporting of information required by this SOW. At a minimum, these procedures shall include the following:
- 4.7.1. Database security, backup and archival procedures including recovery from system failures
 - 4.7.2. System maintenance procedures and response time
 - 4.7.3. Procedure for reviewing changes to information and deliverables and ensuring traceability of updates
 - 4.7.4. Software QA procedures for testing, modifying and implementing changes to existing computing systems including hardware, software, and documentation or installing new systems in accordance with the "Computer Hardware and Software" requirements from ANSI/ANQC E4-1994
 - 4.7.5. Procedure for controlling information entry errors
 - 4.7.6. Individual(s) responsible for system operation, maintenance, data integrity and security
 - 4.7.7. Specifications for staff training procedures.
- 4.8. **Requirements for Subcontractor Health and Safety SOPs:** The subcontractor shall have written SOPs for health and safety compliant with all RFETS and AS01 requirements.

5. SAMPLE SUMMARY RECEIPT

The ASD Sample Summary Receipt is supplied to the customer as notification of sample collection at time of sampling. This form contains a list of all the analyses requested. The subcontractor shall provide the customer with the sample receipt upon the completion of the sampling event.

6. SOFTWARE QA DOCUMENTATION REQUIREMENTS

The subcontractor shall maintain a program that addresses measures taken to ensure computer programs, other than AST, used to generate information are validated, verified, and documented for both vendor-supplied and in-house software packages. The AST program is exempt from this requirement since the subcontractor managing AST fulfills this requirement. The software QA program shall incorporate the "Computer Hardware and Software" requirements from ANSI/ANQC E4-1994. This program shall include the following minimum requirements:

- 6.1. Software validation shall occur before initial use and following subsequent revisions.
- 6.2. A correlation between the validation documentation and the software shall be established.
- 6.3. A historical file of software revisions and associated validation documentation shall be maintained. The historical file shall be maintained in chronological order.
- 6.4. Computer programs and sample information on electronic media shall be handled, stored, safeguarded, and controlled to prevent damage and deterioration.

EXHIBIT G

GLOSSARY OF TERMS AND ACRONYMS

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GLOSSARY OF TERMS AND ACRONYMS

1. INTRODUCTION

The glossary of terms and acronyms contained in this Exhibit ensure the proper understanding of language used in this SOW. The definitions used in General Sampling Activities SOPs and documents shall supersede the definitions used in this Exhibit in cases of conflicting definitions.

2. GLOSSARY OF TERMS

ANALYTICAL SERVICES DIVISION: A division of Kaiser-Hill Environmental Systems and Stewardship that is responsible for the coordination of analytical services at RFETS.

ANALYTICAL SERVICES TOOLKIT: The ASD computer system for tracking analytical services, which is also known as the Analytical Services Tracking System.

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

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).

CONTRACTOR TECHNICAL REPRESENTATIVE (CTR) Person responsible for providing technical oversight of the sub-contract.

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

DAY: Day shall mean calendar day, unless otherwise specified as for TATs in Exhibit A Table A-1. 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 for a specific analytical procedure.

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

EQUIPMENT BLANK: A sample consisting of the final rinse water from sampling equipment which is collected only if the sampling equipment is to be reused.

FIELD BLANK: A full set of sample bottles filled with American Society for Testing Materials (ASTM) Type II water, preserved with appropriate reagents and taken to the field. They are opened at a specific sampling location and exposed to the sampling environment during the sampling. The field blank is used to indicate the presence of contamination due to sample collection and handling.

FIELD DUPLICATE: Independent samples collected as close as possible to the same point in time and space used to document sampling process precision. Duplicates are two separate samples taken from the same source, placed in separate sample containers, and analyzed independently.

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.

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)

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.

LABORATORY: facility that performs analytical analyses of samples. May be synonymous with Contractor as used herein.

LINE ITEM CODE: A Line Item Code (LIC), included on the COC or other documentation received with samples, designates the requested analyses and analysis method requirements. A LIC may also designate the Sample Handling and Shipping activity and its fixed unit rate charge (e.g. AS02B001).

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 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 and determined for the entire sample preparation and analysis process.

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.

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.

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.

REAGENT WATER: Synonymous with ASTM Type II water or better; does not contain any analytes of interest.

REPORT IDENTIFICATION NUMBER (RIN): A grouping of samples identified by the CTR to be included in a single sample data package for a given PSA Module. An 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.

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

SAMPLING EVENT: The collection of samples from the same location during the same time period and under the same environmental conditions.

SAMPLING PROJECT: The collection of samples for one or more sampling events.

SITE: The Rocky Flats Environmental Technology Site (RFETS)

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.

STATEMENT OF WORK (SOW): As used herein, the general requirements modules (GR01 and GR02) and the PSA Module(s).

TRIP BLANK: A volatile organic compound (VOC) vial filled with ASTM Type II water, transported in the same manner as other sampling containers to the sampling sites and back to the laboratory for analysis. Trip blanks help determine the level of contamination introduced to the sample during transport, handling, and storage.

TURN-AROUND-TIME As used herein, the turn-around-time (TAT) is the elapsed time from the date a sample is received at the sample receipt station to the date the laboratory receives the sample for analysis (VTSR). The TAT is a performance measure used to assess subcontractor compliance to delivery schedules.

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

WATER: Synonymous with aqueous or wastewater as used herein.

3. ACRONYMS

AA	Atomic Absorption
AIHA	American Industrial Hygiene Association
ANSI	American National Standards Institute
APHA	American Public Health Association
ASD	Analytical Services Division
ASME	American Society of Mechanical Engineers
AST	Analytical Services Toolkit
ASTM	American Society for Testing and Materials
BNA	Base Neutral Acid (Semivolatile organic)
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
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
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
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
IDL	Instrument Detection Limit
IPA	Instrument Performance Assessment
IR	Infra-red
IW	Incidental Water
KLP	Kinetic Laser Phosphorescence
KPA	Kinetic Phosphorescence Analysis
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
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
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
PA	Protected Area
PB	Preparation Blank
PCB	Polychlorinated Biphenyls
PE	Performance Evaluation
PL	Project Lead (ASD)
PN	Price Negotiable
PQL	Practical Quantitation Limit
PSA	Parameter-Specific Analytical (Module)
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
RFP	Rocky Flats Plant
RIN	Report Identification Number
ROI	Region of Interest
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
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

URC Unit Rate Charge
USEPA United States Environmental Protection Agency
VTSR Validated Time of Sample Receipt
VOA Volatile Organic Analysis
VOC Volatile Organic Compound

EXHIBIT H

REFERENCES

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GENERAL SAMPLING ACTIVITIES

REFERENCES

1. REFERENCES

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- 1.3. DOE Order 460.1A, *Packaging Transportation Safety*, October 02, 1996 (Cancels 460.1)
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- 1.5. DOE G-460.2-1, *Implementation Guide for Use with DOE Order 460.2, Departmental Transportation and Packaging Management*, November 15, 1996
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- 1.10. RFETS MAN-T91-STSM-001, *Site Transportation Safety Manual*
- 1.11. RFETS PRO-543-ASD-002, *Initiation, Preparation, and Implementation of Chain-Of-Custody Forms*
- 1.12. RFETS PRO-T95-OSTP-002, *Off Site Transportation Procedure*
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