USEPA CONTRACT LABORATORY PROGRAM

STATEMENT OF WORK

FOR

INORGANIC ANALYSIS

Multi-Media, Multi-Concentration

ILM06.X
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November 2005

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STATEMENT OF WORK

TABLE OF CONTENTS

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EXHIBIT A

SUMMARY OF REQUIREMENTS

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Exhibit A - Summary of Requirements

Table of Contents

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1.0 PURPOSE

The purpose of the multi-media, multi-concentration inorganic analytical service is to provide analytical data for use by the U.S. Environmental Protection Agency (USEPA) in support of the investigation and clean-up activities under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA). Other USEPA Program Offices that have similar analytical data needs also use this service.

2.0 DESCRIPTION OF SERVICE

The inorganic analytical service provides a contractual framework for laboratories. This framework applies USEPA Contract Laboratory Program (CLP) analytical methods for the isolation, detection, and quantitative measurement of 23 metals (including mercury) and cyanide in water/aqueous and soil/sediment samples. The SOW also includes methods for total metals analysis in wipes and air filters. The analytical service contract provides specific contractual requirements by which USEPA will evaluate the data.

3.0 DATA USES

This analytical service contract provides data which USEPA uses for a variety of purposes, such as: determining the nature and extent of contamination at a hazardous waste site, assessing priorities for response based on risks to human health and the environment, determining appropriate cleanup actions, and determining when remedial actions are complete. The data may be used in all stages in the investigation of hazardous waste sites, including: site inspections, Hazard Ranking System (HRS) scoring, remedial investigation/feasibility studies, remedial design, treatability studies, and removal actions.

The data may also be used in litigation against Potentially Responsible Parties in the enforcement of Superfund legislation. As a result, the Contractor must be aware of the importance of maintaining the integrity of the data generated under this contract, since it is used to make major decisions regarding public health and environmental welfare. The Contractor may be required to appear and testify to the accuracy and/or validity of the data generated.

4.0 SUMMARY OF REQUIREMENTS

4.1 Introduction to the Inorganic Statement of Work

The Statement of Work (SOW) is comprised of eight exhibits. Exhibit A provides an overview of the SOW and its general requirements. Exhibit B contains a description of the reporting and deliverables requirements, in addition to the data reporting forms and instructions. Exhibit C specifies the Inorganic Target Analyte List (TAL) for this SOW with the Contract Required Quantitation Limits (CRQLs) for the sample matrices. Exhibit D details the required analytical procedures to be used with this SOW and resulting contracts. Exhibit E provides descriptions of required Quality Assurance/Quality Control (QA/QC), Standard Operating Procedures (SOPs), QA/QC performance, and the reporting of data. Exhibit F contains chain-of-custody and sample documentation requirements. To ensure proper understanding of the terms utilized in this SOW, a glossary can be found in Exhibit G. When a term is used in the text without explanation, the glossary meaning shall be applicable. Specifications for reporting data in computer-readable format appear in Exhibit H.

4.2 Overview of Major Task Areas

For each sample, the Contractor shall perform the tasks described in each section. Specific requirements for each task are detailed in the exhibits referenced in the following sections.

4.2.1 Task I: Sample Receiving, Storage, and Disposal

4.2.1.1 Chain-of-Custody

The Contractor shall receive and maintain samples under proper chain-of-custody. All associated document control and inventory procedures shall be developed and followed. Documentation described herein shall be required to show that all procedures are strictly followed. Inventory procedures shall include documenting sample location and transfer within the laboratory. This documentation shall be reported as the Complete Sample Delivery Group (SDG) File (CSF) (see Exhibit B). The Contractor shall establish and use appropriate procedures to safeguard confidential information received from USEPA.

4.2.1.2 Sample Scheduling/Shipments

Sample shipments to the Contractor's facility will be scheduled and coordinated by the Contract Laboratory Program (CLP) Sample Management Office (SMO). USEPA may request analyses that include all or a subset of the Inorganic Target Analytes listed in Exhibit C. The Contractor shall communicate with SMO personnel as necessary throughout the process of sample scheduling, shipment, analysis, and data reporting, to ensure that samples are properly processed.

4.2.1.2.1 Samples will be shipped routinely to the Contractor through an overnight delivery service. However, as necessary, the Contractor shall be responsible for any handling or processing of the receipt of sample shipments. This includes the pick-up of samples at the nearest servicing airport, bus station, or other carrier within the Contractor's geographical area. The Contractor shall be available to receive and process sample shipments at any time the delivery service is operating, including Saturdays, to ensure that short sample analysis time requirements can be met.

4.2.1.2.2 If there are problems with the samples (e.g., mixed media, containers broken or leaking) or sample documentation and paperwork (e.g., Traffic Reports/Chain of Custody Records not with shipment, sample and Traffic Report/Chain of Custody Record do not correspond), the Contractor shall immediately contact SMO for resolution. The Contractor shall immediately notify SMO regarding any problems and laboratory conditions that affect the timeliness of analyses and data reporting. In particular, the Contractor shall immediately notify SMO personnel in advance regarding sample data that will be delivered late and shall specify the estimated delivery date.

4.2.1.2.3 To monitor the temperature of the sample shipping cooler more effectively, each USEPA Regional Office may include a sample shipping cooler temperature blank with each cooler shipped. The temperature blank will be clearly labeled: USEPA COOLER TEMPERATURE INDICATOR. The Contractor shall record the presence or absence of the cooler temperature indicator bottle on Form DC-1, Item 8 - Cooler Temperature Indicator Bottle (see Exhibit B).

4.2.1.2.3.1 When the USEPA Regional Office supplies a cooler temperature indicator bottle in the sample shipping cooler, the Contractor shall use the USEPA supplied cooler temperature indicator bottle to determine the cooler temperature. The temperature of the cooler shall be measured at the time of sample receipt by the Contractor.

4.2.1.2.3.2 The temperature of the sample shipping cooler shall be measured and recorded immediately upon opening the cooler.

4.2.1.2.3.3 To determine the temperature of the cooler: the Contractor shall locate the cooler temperature indicator bottle in the sample shipping cooler, remove the cap, and insert a calibrated thermometer into the cooler temperature indicator bottle. Prior to recording the temperature, the Contractor shall allow a minimum of 3 minutes, but not greater than 5 minutes, for the thermometer to equilibrate with the liquid in the bottle. At a minimum, the calibrated thermometer (±1°C) shall have a measurable range of 0-50°C. Other devices which can measure temperature may be used if they can be calibrated to ±1°C and have a range of 0-50°C. If a temperature indicator bottle is not present in the cooler, an alternative means of determining cooler temperature shall be used. Under no circumstances shall a thermometer or any other device be inserted into a sample bottle for the purpose of determining cooler temperature. The Contractor shall contact SMO and inform them that a temperature indicator bottle was not present in the cooler. The Contractor shall document the alternative technique used to determine cooler temperature in the SDG Narrative.

4.2.1.2.3.4 If the temperature of the sample shipping cooler's temperature indicator exceeds 10°C, the Contractor shall contact SMO and inform them of the temperature deviation. SMO will contact the Region from which the samples were shipped for instruction on how to proceed. The Region will either require that no sample analysis(es) be performed or that the Contractor proceed with the analysis(es). SMO will in turn notify the Contractor of the Region's decision. The Contractor shall document the Region's decision and the EPA sample numbers of all samples for which temperatures exceeded 10°C in the SDG Narrative.

4.2.1.2.3.5 The Contractor shall record the temperature of the cooler on Form DC-1, under Item 9 - Cooler Temperature, and in the SDG Narrative (see Exhibit B).

4.2.1.2.4 The Contractor is required to retain unused sample volume in the original containers for a period of 60 days after data submission. From time of receipt until analysis, the Contractor shall maintain <u>all</u> water/aqueous (preserved and unpreserved), soil/sediment, and wipe samples at 4°C (±2°C) (see Exhibit B). Filter samples may be stored at room temperature within the laboratory until preparation.

4.2.1.2.5 The Contractor shall be required to routinely return sample shipping containers (e.g., coolers) to the appropriate sampling office within 14 calendar days following shipment receipt (see contract, Section G titled, "Government Furnished Samples").

4.2.1.2.6 Sample analyses will be scheduled by groups of samples, each defined as a Case and identified by a unique EPA Case number assigned by SMO. A Case signifies a group of samples collected at one site or geographical area over a finite time period, and will include one or more field samples with associated blanks. Samples may be shipped to the Contractor in a single shipment or multiple shipments over a period of time, depending on the size of the Case.

4.2.1.2.6.1 A Case consists of one or more SDGs. An SDG is defined by the following, whichever is most frequent:

- Each Case of field samples received, or
- Each 20 field samples [excluding Performance Evaluation (PE) samples] within a Case, or
- Each 7 calendar day period (3 calendar day period for 7 day turnaround) during which field samples in a Case are received (said period beginning with the receipt of the first sample in the SDG).
- In addition, all samples and/or sample fractions assigned to an SDG must have been scheduled under the same contractual turnaround time. Preliminary Results have **no impact** on defining the SDG.

4.2.1.2.6.2 Samples may be assigned to SDGs by matrix (i.e., all soils in one SDG, all waters in another), at the discretion of the laboratory. However, PE samples received within a Case shall be assigned to an SDG containing field samples for that Case. Such assignment shall be made at the time the samples are received, and shall <u>not</u> be made retroactively.

4.2.1.2.6.3 Each sample received by the Contractor will be labeled with an EPA sample number, and accompanied by a Traffic Report/Chain of Custody Record bearing the sample number and descriptive information regarding the sample. EPA sample numbers are continuous, without spaces or hyphens. The Contractor shall complete and sign the Traffic Report/Chain of Custody Record, recording the date of sample receipt and sample condition on receipt for each sample container. <u>The Contractor shall also follow the instructions given on the Traffic Report/Chain of Custody Record in choosing the Quality Control (QC) samples when such information is provided.</u> If no QC sample is designated on the Traffic Report/Chain of Custody Record, the Contractor shall select a sample and notify SMO for Regional acceptance. SMO shall contact the Region for confirmation immediately after notification.

4.2.1.2.6.4 The Contractor shall submit signed copies of Traffic Reports/Chain of Custody Records for all samples in a SDG to SMO within **three working days** following receipt of the last sample in the SDG. Faxed copies of Traffic Reports/Chain of Custody Records do not meet this requirement. Traffic Reports/Chain of Custody Records shall be submitted in SDG sets (i.e., all Traffic Reports/Chain of Custody Records for a SDG shall be clipped together) with an SDG Cover Sheet containing information regarding the SDG, as specified in Exhibit B.

4.2.1.2.6.5 EPA Case numbers, SDG numbers, and EPA sample numbers shall be used by the Contractor in identifying samples received under this contract both verbally and in reports/correspondence.

4.2.1.3 Modified Analysis

The Contractor may be requested by USEPA to perform modified analyses. These modifications will be within the scope of this SOW and may include, but are not limited to, analysis of additional analytes, additional sample matrices, and/or lower quantitation limits. These requests will be made in writing, prior to sample scheduling. All contract requirements specified in the SOW/Specifications will remain in effect unless specifically modified.

4.2.2 Task II: Sample Preparation and Analysis

4.2.2.1 Overview

The Contractor is advised that the samples received under this contract are usually from known or suspected hazardous waste sites and may contain high (greater than 15%) levels of organic and inorganic materials of a potentially hazardous nature and of unknown structure and concentration, and should be handled throughout the analysis with appropriate caution. It is the Contractor's responsibility to take all necessary measures to ensure laboratory safety.

4.2.2.2 The Contractor shall prepare and analyze samples as described in Exhibit D. Sample preparation methods shall remain consistent for all samples analyzed within a Case. Prior to sample analysis, the Contractor shall review the Traffic Report/Chain of Custody Record for any special sample analysis instructions. Anomalies that occur during sample analysis shall be reported to SMO immediately.

The Contractor shall collectively review all analytical results associated with a sample. This includes undiluted, diluted, serial dilution, and interference results. The Contractor shall report any significant anomalies between these results in the SDG Narrative indicating possible matrix interferences.

4.2.2.3 Quality Assurance/Quality Control Procedures

4.2.2.3.1 The Contractor shall strictly adhere to all specific QA/QC procedures prescribed in Exhibits D and E. Records documenting the use of the protocol shall be maintained in accordance with the document control procedures prescribed in Exhibit F, and shall be reported in accordance with Exhibits B and H.

4.2.2.3.2 The Contractor shall maintain a Quality Assurance Management Plan (QAP) with the objective of providing sound analytical chemical measurements. This program shall incorporate the QC procedures, any necessary corrective action, and all documentation required during data collection as well as the quality assessment measures performed by management to ensure acceptable data production.

4.2.2.3.3 Additional QC shall be conducted in the form of the analysis of laboratory PE samples submitted to the laboratory by USEPA. Unacceptable results of any such QC or laboratory PE samples may be used as the basis for an equitable adjustment to reflect the reduced value of the data to USEPA or rejection of the data for specific analyte(s) within an SDG or the entire SDG. Also, unacceptable results may be used as the basis for contract action. "Compliant performance" is defined as that which yields correct analyte identification and concentration values as determined by USEPA, as well as meeting the contract requirements for analysis (Exhibit D); QA/QC (Exhibit E); data reporting and other deliverables (Exhibits B and H); and sample custody, sample documentation, and SOP documentation (Exhibit F).

4.2.3 Task III: Sample Reporting

4.2.3.1 USEPA has provided to the Contractor formats for the reporting of data (Exhibits B and H). The Contractor shall be responsible for completing and submitting analysis data sheets and electronic data in a format specified in this SOW and within the time specified in Exhibit B, Section 1.1.

4.2.3.2 Use of formats other than those designated by USEPA (see Exhibits B and H) will be deemed as noncompliant. Such data are unacceptable. Resubmission in the specified format at no additional cost to the Government shall be required.

4.2.3.3 Computer generated forms may be submitted in the hardcopy Sample Data Package(s) provided that the forms provide equivalent information as the **USEPA format**. This means that the order of data elements is the same as on each USEPA required form, including form numbers and titles, page numbers, and header information.

4.2.3.4 The data reported by the Contractor on the hardcopy data forms and the associated electronic data submitted by the Contractor shall contain identical information. If discrepancies are found during Government inspection, the Contractor shall be required to resubmit either the corrected hardcopy forms or the corrected electronic data, or both sets of corrected data, at no additional cost to USEPA.

EXHIBIT B

REPORTING AND DELIVERABLES REQUIREMENTS

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Exhibit B – Reporting and Deliverables Requirements

Table of Contents

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1.0 CONTRACT REPORTS/DELIVERABLES DISTRIBUTION

1.1 Report Deliverable Schedule

The following table reiterates the contract reporting and deliverables requirements and specifies the distribution that is required for each deliverable. The turnaround times for Items B through E are 7, 14, or 21 days.

NOTE: Specific recipient names and addresses are subject to change during the term of the contract. The USEPA Office of Superfund Remediation and Technology Innovation (OSRTI) Analytical Services Branch (ASB) Inorganic Program Manager (ASB PM) will notify the Contractor in writing of such changes when they occur.

TABLE 1

Item		No. of Copies[A]	Delivery Schedule	Distribution			
				SMO	Region	CLP PO[D]	QATS
A.	Sample Traffic Reports/Chain of Custody Records	1	3 working days after receipt of last sample in Sample Delivery Group (SDG).[1]	X			
B.[2]	Sample Data Package	1	XX[C] days after Validated Time of Sample Receipt (VTSR)[1] of last sample in SDG.	X			
C.[2]	Electronic Data Deliverable	1	XX[C] days after VTSR of last sample in SDG.	X	X		
D.[2]	Results of Intercomparison Study/PE Sample Analysis Study	1	XX[C] days after VTSR of last sample in SDG.	X			X
E.[2,3]	Complete SDG File (CSF)[B]	1	XX[C] days after VTSR of last sample in SDG.		X		
F.[2,4]	Preliminary Results	1	Within 48 hours after receipt of each sample at laboratory, if requested.	X	X		
G.[5,6]	Quarterly Calculation of Critical Levels (L_c) and Limits of Detection (L_d). And Annual Calculation ICP-AES Interelement Correction Factors	1	Quarterly (for L_c, L_d)or Annually (for Interelement Correction Factors)	X		X	X

TABLE 1 (Con't)

Item		No. of Copies[A]	Delivery Schedule	Distribution			
				SMO	Region	CLP PO[D]	QATS
H.[6,7]	Standard Operating Procedures (SOPs)	1	Revise within 30 days after contract award and receipt of USEPA comments. Submit within 7 days of receipt of written request to recipients as directed. (See Exhibit E, Section 6) Submit within 14 days of amended SOP(s) as directed in Exhibit E, Section 6.4.	As Directed Amended SOPs distributed to CLP PO and QATS			
I.[6,7]	Quality Assurance Plan (QAP)	1	Revise within 30 days after contract award and receipt of USEPA comments. Submit within 7 days of receipt of written request to recipients as directed. (See Exhibit E, Section 5) Submit within 14 days of amended QAP as directed in Exhibit E, Section 5.3.	As Directed Amended QAP distributed to CLP PO and QATS			
J.	Electronic Instrument Data	Lot	Retain for 3 years after data submission. Submit within 7 days after receipt of written request by the USEPA Regional CLP PO. (See Exhibit E, Section 13)	As Directed			
K.	Hardcopy Data in PDF Format	1	XX[C] days after receipt of last sample in an SDG.		X		

Footnotes:

[A] The number of copies specified is the number of copies required to be delivered to each recipient.

[B] Contractor-concurrent delivery to USEPA's designated recipient [e.g., Quality Assurance Technical Support (QATS)] may be required upon request by the USEPA OSRTI ASB Inorganic Program Manager (ASB PM). Retain for 365 days after data submission, and submit as directed within 7 days after receipt of written request by the USEPA ASB PM.

[C] The number of days associated with these elements will be provided in the associated laboratory contract document and will also be provided at the time of sample scheduling by the Sample Management Office (SMO) Contractor.

[D] The CLP PO is the USEPA Regional Contract Laboratory Program (CLP) Project Officer (CLP PO) designated on the contract.

[1] Validated Time of Sample Receipt (VTSR) is the date of sample receipt at the Contractor's facility, as recorded on the shipper's delivery receipt and sample Traffic Report/Chain of Custody Record. Sample Delivery Group (SDG) is a group of samples within a Case, received over a period of 7 days or less with the same laboratory turnaround and not exceeding 20 samples [excluding Performance Evaluation (PE) samples]. Data for all samples in the SDG are due concurrently. The date of delivery of the SDG or any samples within the SDG is the date that the last sample in the SDG is received. See Exhibit A for further description.

[2] **DELIVERABLES ARE TO BE REPORTED TOTAL AND COMPLETE.** Concurrent delivery is required. Delivery shall be made such that all designated recipients receive the item on the same calendar day. This includes resubmission of both the hardcopy and electronic deliverable. The date of delivery of the SDG, or any sample within the SDG, is the date all samples have been delivered. **If the deliverables are due on a Saturday, Sunday, or Federal holiday, then they shall be delivered on the next business day. Deliverables received after this time will be considered late.**

[3] Complete SDG File (CSF) will contain the original Sample Data Package plus all of the original documents described in Exhibit B, Section 2.6.

[4] If requested at the time of sample scheduling, the Contractor shall provide Preliminary Results, consisting of Form I sample analyses via facsimile or email. The Contractor may submit Preliminary Results in electronic format after obtaining permission from USEPA. The Contractor shall be notified of the Fax number or email address at the time of sample scheduling. Sample Traffic Reports/Chain of Custody Records (TR/COCs) and SDG Cover Sheets shall be submitted with the Preliminary Results. The Contractor shall contact SMO after confirming transmission. The Contractor shall document all communication in a communication log.

Preliminary Results Delivery Schedule:

If a sample requiring Preliminary Results arrives before 5 p.m., the Preliminary Results are due within the required turnaround time. If a sample requiring Preliminary Results is received after 5 p.m., the Preliminary Results are due within the required turnaround time beginning at 8 a.m. the following day. **DELIVERABLES ARE TO BE REPORTED TOTAL AND COMPLETE. Concurrent delivery is required. Delivery shall be made such that all designated recipients receive the item on the same calendar day. If the deliverables are due on a Saturday, Sunday, or Federal holiday, then they shall be delivered the next business day. Deliverables reported after this time will be considered late.**

Footnotes (Con't):

[5] Also required in each Sample Data Package.

[6] See Exhibit E for description. Time is cited in calendar days.

[7] The Contractor shall deliver both hardcopy and electronic (e.g., diskette) copies of the Standard Operating Procedures (SOPs) and Quality Assurance Management Plan (QAP).

1.2 Distribution

The following addresses correspond to the "Distribution" column in Exhibit B, Section 1.1, Table 1.

SMO: USEPA Contract Laboratory Program (CLP)
Sample Management Office (SMO)[1]
15000 Conference Center Drive
Chantilly, VA 20151-3808

Region: USEPA REGIONS: SMO will provide the Contractor with the list of addressees for data delivery for the 10 USEPA Regions. SMO will provide the Contractor with updated Regional address/name lists as necessary throughout the period of the contract and identify other client recipients on a case-by-case basis.

USEPA Regional CLP Project Officer (CLP PO):

SMO will provide the Contractor with the list of addresses for the USEPA Regional CLP POs. SMO will provide the Contractor with updated name/address lists as necessary throughout the period of the contract.

QATS: USEPA Contract Laboratory Program (CLP)
Quality Assurance Technical Support (QATS) Laboratory[2]
2700 Chandler Avenue, Building C
Las Vegas, NV 89120
Attn: Data Audit Staff

In addition, the mailing and delivery addresses for the USEPA ASB Inorganic Program Manager (ASB PM) are:

Mailing Address: USEPA OSRTI Analytical Services Branch
Ariel Rios Building (5204G)
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460
Attn: CLP Inorganic Program Manager

Fed-Ex/Overnight Delivery: USEPA OSRTI Analytical Services Branch
1235 Jefferson Davis Highway
Crystal Gateway I, 12th Floor
Arlington, VA 22202
Attn: CLP Inorganic Program Manager

[1] The SMO is a Contractor-operated facility operating under the SMO contract awarded and administered by USEPA.

[2] The QATS laboratory is a Contractor-operated facility operating under the QATS contract awarded and administered by USEPA.

2.0 REPORTING REQUIREMENTS AND ORDER OF DATA DELIVERABLES

2.1 Introduction

The Contractor shall provide reports and other deliverables as specified in Exhibit B, Section 1.1. The required content and form of each deliverable is described in this exhibit. All reports and documentation **shall be**:

- Legible;
- Clearly labeled and completed in accordance with instructions in this exhibit;
- Arranged in the order specified in this section;
- Paginated sequentially according to instructions in this exhibit; and
- Double-sided.

NOTE: Complete Sample Delivery Group (SDG) Files (CSFs) need not be double-sided. (The CSF is composed of original documents.) However, Sample Data Packages delivered to the USEPA Contract Laboratory Program (CLP) Sample Management Office (SMO) and the Region, [and USEPA designated recipients, e.g., Quality Assurance Technical Support (QATS), upon written request] must be double-sided.

2.1.1 The Contractor shall use EPA Case numbers, SDG numbers, and EPA sample numbers to identify samples received under this contract, both verbally and in reports and correspondence. The contract number and the SOW number shall be specified in all correspondence. The Mod. Ref. No. shall also be included for all Modified Analyses.

2.1.2 Section 4 of this exhibit contains the required Data Reporting Forms in Agency-specified format. Section 3 of this Exhibit contains instructions to the Contractor for properly completing all data reporting forms to provide USEPA with all required data. Data elements and instructions for reporting data in computer-readable format are contained in Exhibit H.

2.2 Resubmission of Data

If submitted documentation does not conform to the above criteria, the Contractor is required to resubmit such documentation with deficiency(ies) corrected within 4 business days, at no additional cost to USEPA.

2.2.1 Whenever the Contractor is required to submit or resubmit data as a result of an on-site laboratory evaluation, through the USEPA Regional CLP Project Officer (CLP PO) action, or through a Regional data reviewer's request, the data shall be clearly marked as "Additional Data" and shall be sent to both contractual data recipients (SMO and Region) and to USEPA's designated recipient (e.g., QATS) when a written request for the Sample Data Package has been made. A cover letter shall be included which describes what data is being delivered, to which USEPA Case(s) the data pertains, and **who requested the data**.

2.2.2 Whenever the Contractor is required to submit or resubmit data as a result of Contract Compliance Screening (CCS) review by SMO, the data shall be sent to the two contractual data recipients (SMO and Region) and to USEPA's designated recipient (e.g., QATS) when a written request for the Sample Data Package has been made. In all instances, the Contractor shall include a color-coded cover sheet (Laboratory Response to Results of Contract Compliance Screening) provided by SMO. Electronic deliverables shall be submitted or resubmitted to SMO and the Region. Revised DC-1 and DC-2 forms shall be resubmitted to SMO and the Region.

2.3 Quality Assurance (QA) Management Plan and Standard Operating Procedures (SOPs)

The Contractor shall adhere to the requirements in Exhibits E and F.

2.4 Sample Traffic Reports/Chain of Custody Records

Each sample received by the Contractor will be labeled with an EPA sample number and will be accompanied by a Sample Traffic Report/Chain of Custody Record bearing the sample number and descriptive information regarding the sample. The current CLP Traffic Report is the "Inorganic Traffic Report & Chain of Custody Record". The CLP Traffic Report/Chain of Custody Record is one form divided into two sections: the Traffic Report section and the Chain of Custody Record section. The Contractor shall complete the CLP Traffic Report/Chain of Custody Record (marked "Lab Copy for Return to SMO"), recording the date of sample receipt, verifying the number of samples, and signing the CLP Traffic Report/Chain of Custody Record.

Upon receipt, the Contractor shall sign for receipt of samples in the Chain of Custody Record section. The laboratory sample custodian or designated recipient opening and verifying the contents of the cooler shall then verify receipt of all samples identified within the CLP Traffic Report section and sign and date the signature box located in the CLP Traffic Report section. If a non-CLP Traffic Report/Chain of Custody Record is submitted with the samples, for example a Regional Traffic Report/Chain of Custody Record, then the Contractor shall (1) sign and date receipt of the samples to maintain the chain-of-custody and (2) the sample custodian or designated recipient shall sign and date the Traffic Report/Chain of Custody Record to verify sample information.

The Contractor shall also enter the Sample Delivery Group (SDG) number, Case number, and the laboratory contract number on the CLP Traffic Report/Chain of Custody Record, in the appropriate boxes. The EPA sample number of the first sample received in the SDG is the SDG number. When several samples are received together in the first SDG shipment, the SDG number shall be the lowest sample number (considering both alpha and numeric designations) in the first group of samples received under the SDG. Under no circumstances should any SDG number be replicated within a Case. If necessary, select an alternative sample number for the SDG number. The SDG number is also reported on all data reporting forms (see Exhibit B, Section 3 - Form Instructions). If the laboratory is requested to transfer samples to another facility, the Contractor shall date and enter the name of the facility to where the samples will be transferred on the CLP Traffic Report/Chain of Custody Record.

2.4.1 The Contractor shall submit Traffic Reports/Chain of Custody Records in SDG sets (i.e., Traffic Reports/Chain of Custody Records for all samples in an SDG shall be clipped together), with an SDG Cover Sheet attached. The SDG Cover Sheet shall contain the following items:

- Laboratory name;
- Contract number;
- Sample analysis price (full sample price from the contract);
- Case number; and
- List of EPA sample numbers of all samples in the SDG, identifying the **first** and **last** samples received, and their Laboratory Receipt Dates (LRDs).

NOTE: When more than one sample is received in the first or last SDG shipment, the "first" sample received would be the sample with the lowest sample number (considering both alpha and numeric designations); the "last" sample received would be the sample with the highest sample number (considering both alpha and numeric designations).

2.4.2 EPA field sample numbers are continuous, without spaces or hyphens. The original Sample Traffic Report/Chain of Custody Record page marked "Lab Copy for Return to SMO", with laboratory receipt information and signed with original Contractor signature shall be submitted for each sample in the SDG.

2.4.3 If samples are received at the laboratory with multi-sample Traffic Reports/Chain of Custody Records, all the samples on one multi-sample Traffic Report/Chain of Custody Record may not necessarily be in the same SDG. In this instance, the Contractor shall make the appropriate number of photocopies of the Traffic Report/Chain of Custody Record, and submit one copy with each SDG Cover Sheet.

2.5 Sample Data Package

The Sample Data Package shall include data for analysis of all samples in one SDG, including field and analytical samples, blanks, spikes, duplicates, and Laboratory Control Samples (LCSs). The Sample Data Package shall be complete before submission, and shall be consecutively paginated (starting with page number one and ending with the number of all pages in the package). The Sample Data Package shall include the following:

2.5.1 Cover Documentation

2.5.1.1 Full Inorganics Complete SDG File (CSF) Inventory Sheet [Form DC-2]

2.5.1.2 SDG Narrative. This document shall be clearly labeled "SDG Narrative" and shall contain: laboratory name, Case number, SDG number, SOW number, contract number, and detailed documentation of any Quality Control (QC), sample, shipment, and/or analytical problems encountered in processing the samples reported in the Sample Data Package. The Contractor shall list the target analytes for the SDG. The Contractor shall include any technical and administrative problems encountered and the resolution or corrective actions taken. This includes documenting the alternative technique used to determine cooler temperature if a temperature indicator bottle is not present in the cooler. The Contractor shall also provide, in the SDG Narrative, sufficient information, including equations or curves (at least one equation or curve per method), to allow the recalculation of sample results from raw instrument output. The Contractor shall also include a discussion of any Statement of Work (SOW) Modified Analyses. This includes attaching a copy of the USEPA approved modification form to the SDG Narrative. Additionally the Contractor shall also identify and explain any differences which exist between the Form Is and supporting documentation provided in the data package and those previously provided as Preliminary Results.

2.5.1.3 Sample Log-In Sheet [Form DC-1]

2.5.1.4 Sample Traffic Reports/Chain of Custody Records

2.5.1.5 Cover Page for the inorganic analyses Data Package shall include: laboratory name; laboratory code; contract number; Case number; SDG number; Modification Reference Number (Mod. Ref. No.) (if appropriate); EPA sample numbers in alphanumeric order showing EPA sample numbers cross-referenced with laboratory Sample ID numbers; and completion of the questions on use of background and interelement corrections for the samples.

2.5.1.5.1 The Cover Page shall contain the following statement, verbatim: **"I certify that this Sample Data Package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy Sample Data Package and in the electronic data submitted has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature."** This statement shall be directly followed by the signature of the Laboratory Manager or designee with typed lines containing the signer's name and title, and the date of signature.

2.5.2 Sample Data

Sample data shall be submitted with the inorganic analysis data reporting forms for all samples in the SDG. Data should be arranged in increasing alphanumeric EPA sample number order, followed by the QC analyses data, annual verification of method and instrument parameters forms, raw data, and copies of the digestion and distillation logs.

2.5.2.1 Inorganic Analysis Data Sheet [Form IA-IN and Form IB-IN]. Tabulated analytical results of the requested analytes shall be included. The validation and release of these results is authorized by a specific signed statement on the Cover Page. In the event that the laboratory cannot verify all data reported for each sample, the Laboratory Manager shall provide a detailed description of the problems associated with the sample(s) in the SDG Narrative.

2.5.2.1.1 Appropriate concentration units shall be specified and entered on Forms IA-IN and IB-IN. The quantitative values shall be reported in units of micrograms per Liter (ug/L) for water samples, milligrams per kilogram (mg/kg) for solid samples, and micrograms (ug) for wipe and air filter samples. (No other units are acceptable.) Results for solid samples shall be reported on a dry weight basis. Analytical results shall be reported to two significant figures if the result value is less than 10 and to three significant figures if the value is greater than or equal to 10. Results for percent solids shall be reported to this same format.

2.5.2.2 Quality Control (QC) Data

2.5.2.2.1 The QC summary for inorganic analysis shall contain the forms listed below.

NOTE: If more than one form is necessary, duplicate forms must be arranged in chronological order.

2.5.2.2.1.1 Initial and Continuing Calibration Verification [Form IIA-IN]

2.5.2.2.1.2 Blanks [Form III-IN]

2.5.2.2.1.3 ICP-AES Interference Check Sample [Form IVA-IN]

2.5.2.2.1.4 ICP-MS Interference Check Sample [Form IVB-IN]

2.5.2.2.1.5 Matrix Spike Sample Recovery [Form VA-IN]

2.5.2.2.1.6 Post-Digestion Spike Sample Recovery [Form VB-IN]

2.5.2.2.1.7 Duplicates [Form VI-IN]

2.5.2.2.1.8 Laboratory Control Sample [Form VII-IN]

2.5.2.2.1.9 ICP-AES and ICP-MS Serial Dilutions [Form VIII-IN]

2.5.2.2.1.10 Critical Level and Limit of Detection (Quarterly) [Form IX-IN]

2.5.2.2.1.11 ICP-AES Interelement Correction Factors (Annually) [Form XA-IN]

2.5.2.2.1.12 ICP-AES Interelement Correction Factors (Annually) [Form XB-IN]

2.5.2.2.1.13 Limit of Quantitation (Quarterly) [Form XI-IN]

2.5.2.2.1.14 Preparation Log [Form XII-IN]

2.5.2.2.1.15 Analysis Run Log [Form XIII-IN]

2.5.2.2.1.16 ICP-MS Tune [Form XIV-IN]

2.5.2.2.1.17 ICP-MS Internal Standards Relative Intensity Summary [Form XV-IN]

2.5.2.3 Raw Data

For each reported value, the Contractor shall include in the Sample Data Package all raw data used to obtain that value. This applies to all required QA/QC measurements, instrument standardization, as well as all sample analysis results. This statement does not apply to the annual verification of method and instrument parameters submitted as a part of each Sample Data Package. When analysis of the ICP-AES or ICP-MS target analytes listed in Exhibit C of this SOW (or any subset or additional analytes) is requested, the raw data shall include, for all samples, not only the results for the requested analyte(s), but also those for all the interferents (Exhibit D/ICP-AES, Table 1, or Exhibit D/ICP-MS, Section 7.2.4.4.1, as appropriate). The raw data shall also contain the results of any other analyte(s) which have been determined to interfere with the requested analytes(s).

2.5.2.3.1 Raw data shall contain all instrument readouts and data pertinent to the reconstruction of the analysis and results (e.g., Batch Sheets) used for the sample results. For example: if for a reduced analyte list, the instrument is applying an interelement correction, the data used to calculate the correction must be present in the raw data. Each exposure or instrumental reading shall be provided, including those readouts that may fall below the Critical Level (L_c). Raw data shall not be corrected for dilutions or volume adjustments. All Atomic Absorption (AA), Inductively Coupled Plasma - Atomic Emission Spectrometer (ICP-AES), and Inductively Coupled Plasma - Mass Spectrometer (ICP-MS) instruments shall provide a legible hardcopy of the direct real-time instrument readout (i.e., strip charts, printer tapes, etc.) or a printout of the unedited instrument data output file. A photocopy of the instrument's direct sequential readout shall be included. A hardcopy of the instrument's direct readout shall be included for cyanide if the instrumentation has the capability.

2.5.2.3.2 The order of raw data in the Sample Data Package for inorganic analyses shall be: ICP-AES, ICP-MS, mercury, and cyanide. All raw data shall include concentration units for ICP, and absorbances or concentration units for mercury and cyanide.

2.5.2.3.3 Corrections to the laboratory data reporting forms and raw data shall be made by drawing single lines through the errors and entering the correct information. Information shall not be obliterated or rendered unreadable. Corrections and additions to information shall be signed (or initialed) and dated.

2.5.2.3.4 Raw data shall be labeled with EPA sample numbers and appropriate codes, shown in Exhibit B, Table 2 - Codes for Labeling Data, following, to unequivocally identify:

- Calibration standards, including source and preparation date. Standard preparation logbooks can be submitted if they contain this information;
- Initial and Continuing Calibration Blanks (ICBs/CCBs) and Preparation Blanks (PBs);

- Initial and Continuing Calibration Verification (ICV/CCV) standards, Interference Check Samples (ICSs), serial dilution samples, LCS, and post digestion spike;
- Diluted and undiluted samples (by EPA sample number) and all weights, dilutions, and volumes used to obtain the reported values (if the volumes, weights, and dilutions are consistent for all samples in a given SDG, a general statement outlining these parameters is sufficient);
- Duplicates;
- Spikes (indicating standard solutions used, final spike concentrations, and volumes involved). If spike information (source, concentration, volume) is consistent for a given SDG, a general statement outlining these parameters is sufficient;
- Instrument used, any instrument adjustments, data corrections or other apparent anomalies on the measurement record, including all data voided or data not used to obtain reported values and a brief written explanation; and
- Time and date of each analysis. Instrument run logs can also be submitted if they contain time and date of analysis. If the instrument does not automatically provide times of analysis, these shall be manually entered on all raw data (e.g., ICV/CCV and blanks).

Table 2. Codes for Labeling Data[1,2]

Sample	XXXXXX
Sample Not Part of the SDG	ZZZZZZ
Duplicate	XXXXXXD
Matrix Spike	XXXXXXS
Serial Dilution	XXXXXXL
Analytical Spike/Post Digestion/Distillation Spike	XXXXXXA
Instrument Calibration Standards:	
ICP	S or S0 for blank standard
Atomic Absorption and Cyanide	S0, S10,...etc.
Initial Calibration Verification	ICV
Initial Calibration Blank	ICB
Continuing Calibration Verification	CCV
Continuing Calibration Blank	CCB
Interference Check Samples:	
Solution A	ICSA
Solution AB	ICSAB
Laboratory Control Samples:	LCS
Preparation Blank (Water)	PBW
Preparation Blank (Soil)	PBS
Preparation Blank (Wipe/Filter)	PBF
Baseline Correction	BASELINE
Reslope	RESLOPE
Cyanide Mid-Range Standard	MIDRANGE
ICP-MS Tune Check	TUNE

[1] The numeric suffix that follows the "S" suffix for the standards indicates the true value of the concentration of the standard in ug/L.

[2] ICP-AES and ICP-MS calibration standards usually consist of several analytes at different concentrations. Therefore, no numeric suffix can follow the ICP calibration standards unless all the analytes in the standard are prepared at the same concentrations. For instance, the blank for ICP shall be formatted "S0".

2.5.2.4 Digestion and Distillation Logs. The following logs shall be submitted as appropriate for each preparation procedure: digestion logs for ICP-AES, ICP-MS, mercury preparations, and distillation logs for cyanide. These logs shall include: (1) date; (2) sample weights and volumes, with initial sample weight/volume and final volume clearly indicated; (3) sufficient information to unequivocally identify which QC samples (i.e., LCS, PB) correspond to each batch digested; (4) comments describing any significant sample changes or reactions which occur during preparation shall be entered in the log and noted in the SDG Narrative; (5) indication of pH less than or equal to 2 or greater than or equal to 12, as applicable; (6) any dilutions used in preparing PE samples; and (7) identification of the sample preparer(s) [signature(s)].

2.6 Complete SDG File (CSF)

As specified in the Delivery Schedule, one CSF (including the original Sample Data Package) shall be delivered to the Region concurrently with the delivery of a copy of the Sample Data Package to SMO. Delivery to USEPA's designated recipient (e.g., QATS) is only required upon written request.

2.6.1 The CSF shall contain all original documents where possible. No photocopies of original documents shall be placed in the CSF unless the original data was initially written in a bound notebook, maintained by the Contractor, or the originals were previously submitted to USEPA with another Case/SDG in accordance with the requirements described in Exhibit F. The CSF shall contain all original documents and be numbered according to the specifications in Exhibit B, Sections 3 and 4, and Form DC-2.

2.6.2 The CSF shall consist of the following original documents in addition to the documents in the Sample Data Package.

NOTE: All Case-related documentation may be used or admitted as evidence in subsequent legal proceedings. Any other Case-specific documents generated after the CSF is sent to USEPA, as well as copies that are altered in any fashion, are also deliverables to USEPA. Send the original to the Region and a copy to SMO. Send to USEPA's designated recipient (e.g., QATS) only upon written request.

2.6.2.1 Original Sample Data Package

2.6.2.2 A completed and signed Full Inorganics Complete SDG File (CSF) Inventory Sheet [Form DC-2]

2.6.2.3 All original shipping documents, including, but not limited to, the following documents:

- USEPA Sample Traffic Reports/Chain of Custody Records
- Airbills (if an airbill is not received, include a hardcopy receipt requested from the shipping company or a printout of the shipping company's electronic tracking information); and
- Sample Tags (if present) sealed in plastic bags.

2.6.2.4 All original receiving documents, including, but not limited to, the following documents:

- Form DC-1;
- Other receiving forms or copies of receiving logbooks; and
- SDG Cover Sheet.

2.6.2.5 All original laboratory records of sample transfer, preparation, and analysis, including, but not limited to, the following documents:

- Original preparation and analysis forms or copies of preparation and analysis logbook pages; and
- Internal sample and sample digestate and distillate transfer Chain of Custody Records.
- PE Instruction forms.

2.6.2.6 All other original SDG-specific documents in the possession of the laboratory, including, but not limited to, the following documents:

- Communication logs;
- Copies of personal logbook pages;
- All handwritten SDG-specific notes; and
- Any other SDG-specific documents not covered by the above.

2.6.3 If the Contractor does submit SDG-specific documents to USEPA after submission of the CSF, the documents shall be numbered as an addendum to the CSF and a revised Form DC-2 shall be submitted; or the documents shall be numbered as a new CSF and a new Form DC-2 shall be submitted to the Region only.

2.6.4 The Contractor shall retain a legible electronic (PDF) or hard copy of the CSF for 365 days after submission of the reconciled data package. After this time, the Contractor may dispose of the package.

2.7 Data in Electronic Format

The Contractor shall provide an electronic data deliverable on analytical data for all samples in the SDG, as specified in Exhibit H, and delivered as specified in the Contract Schedule (Performance/Delivery Schedule).

2.8 Results of the Intercomparison and Performance Evaluation (PE) Sample Analyses

Tabulation of analytical results for intercomparison/PE sample analyses includes all requirements specified in Exhibit B, Sections 2.5 and 2.7.

2.9 Preliminary Results

The Form Is data results (including all appropriate qualifiers and flags) shall be submitted for all samples in one SDG of a Case. Sample analysis shall follow all requirements stipulated in Exhibit D. The Contractor shall clearly identify the Preliminary Results by labeling each Form I as "Preliminary Results" under the form title (e.g., under Inorganic Analysis Data Sheet). The Contractor shall also include a disclaimer in the "Comments" field on all Form Is stating that the "Data results contained on this Form I are for screening purposes only, and may not have been validated for CLP criteria." Sample Traffic Reports/Chain of Custody Records and SDG Cover Sheets shall be submitted with the Preliminary Results.

2.9.1 The Contractor shall submit the Cover Page following the specifications in Exhibit B, Sections 2.5.1 and 3.4.1. The Cover Page shall be clearly labeled to indicate that the data being reported are Preliminary Results. The Cover Page shall contain the following statement, verbatim: **"I certify that these Preliminary Results are in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature."** This statement shall be directly followed by the signature of the Laboratory Manager or designee with typed lines containing the signer's name and title, and the date of signature.

2.10 Quarterly Calculation of Limits of Detection and Annual Interelement Correction Factors

The Contractor shall perform and report quarterly calculation of the Critical Levels and Limits of Detection by the method specified in Exhibit D for each instrument used under this contract. The Contractor shall also perform and report annual ICP-AES interelement correction factors (including method of determination), wavelengths used, and integration times. Forms reporting results for the quarterly or annual verification of method and instrument parameters for the current period shall be submitted in each Sample Data Package, using Inorganic Forms IX, XA, XB, and XI. Submission of the calculation of method and instrument parameters shall include the data used to determine the values reported as well as, for the IECs, the standard preparation logs, sample preparation logs, and analysis logs with analytical sequences.

2.11 Electronic Instrument Data

The Contractor shall adhere to the requirements in Exhibit E.

2.12 Delivery of Hardcopy Data in PDF Format

In addition to all required deliverables identified in the laboratory's contract and the ILM06.X SOW, the laboratory shall provide a complete copy of the hardcopy deliverable in PDF on a Compact Disc (CD).

2.12.1 The PDF file shall be organized in accordance with the directions provided in Exhibit B, "Reporting Requirements and Order of Data Deliverables" of the ILM06.X SOW. The PDF shall be bookmarked as described below for ease of data retrieval and navigation.

2.12.2 Inorganic data shall be bookmarked using a hierarchical bookmark structure (i.e., an overview or "parent" bookmark, and a subordinate or "child" bookmark nested underneath the "parent" bookmark). The required hierarchical structure is shown in Table 3.

TABLE 3. Hierarchical Bookmark Structure

Group Bookmark	**Parent Bookmark**	**Child Bookmark**
Form DC-2, SDG Narrative, Form DC-1, Sample TR/COCs, and Cover Page for inorganic analyses		
Sample Data	QC Summary	Inorganic Analysis Data Sheet
		Initial and Continuing Calibration Verification
		Blanks
		ICP-AES Interference Check Sample
		ICP-MS Interference Check Sample
		Matrix Spike Sample Recovery
		Post-Digestion Spike Sample Recovery
		Duplicates
		Laboratory Control Sample
		ICP-AES and ICP-MS Serial Dilutions
		Critical Level (L_c) and Limit of Detection (L_d) (Quarterly)
		ICP-AES Interelement Correction Factors (Annually)
		Limit of Quantitation (L_q)(Quarterly)
		Preparation Log
		Analysis Run Log
		ICP-MS Tune
		ICP-MS Internal Standards Relative Intensity Summary
	Raw Data	ICP-AES
		ICP-MS
		Mercury
		Cyanide
		Digestion and Distillation Logs

2.13 Corrective Action Procedures

If the Contractor fails to adhere to the requirements detailed in this SOW, the Contractor will be in noncompliance with the contract and may be subjected to sanctions as described in the contract.

3.0 FORM INSTRUCTIONS

3.1 Introduction

This section contains specific instructions for the completion of all required Inorganic Data Reporting Forms.

3.2 General Information

Values shall be reported on the hardcopy forms according to the respective form instructions in this section. Each form submitted shall be filled out completely for all analytes before proceeding to the next form of the same type. Do not submit multiple forms if the information on those forms can be submitted on one form.

3.2.1 The data reporting forms discussed in Exhibit B, Section 3.4, and presented in Exhibit B, Section 4.0, have been designed in conjunction with the electronic data format specified in Exhibit H. Information entered on these forms shall **not** exceed the size of the field given on the form, including such laboratory-generated items as "Lab Name" and "Lab Sample ID".

3.2.2 All characters which appear on the data reporting forms presented in the contract shall be reproduced by the Contractor when submitting data, and the format of the forms submitted shall provide exactly the same information as that shown in the contract. No information may be added, deleted, or moved from its specified position without prior written approval of the USEPA Regional Contract Laboratory Program Project Officer (CLP PO) or the USEPA Office of Superfund Remediation and Technology Innovation (OSRTI) Analytical Services Branch (ASB) Inorganic Program Manager (ASB PM). The names of various fields and analytes (i.e., "Lab Code", "Aluminum") shall appear as they do on the forms in the contract, including the options specified in the form.

3.3 Header Information

Six pieces of information are common to the header sections of each data reporting form. These are: Laboratory Name, Contract, Laboratory Code, Case number, Modification Reference Number (Mod. Ref. No.), and Sample Delivery Group (SDG) number. Except as noted for Mod. Ref. No., this information shall be entered on every form and shall match on all forms.

3.3.1 Laboratory Name. The "Lab Name" shall be the name chosen by the Contractor to identify the laboratory.

3.3.2 Contract. The "Contract" is the number of the USEPA contract under which the analyses were performed.

3.3.3 Laboratory Code. The "Lab Code" is an alphabetic abbreviation, assigned by USEPA, to identify the laboratory and aid in data processing. This laboratory code will be assigned by USEPA at the time a contract is awarded. The laboratory code shall not be modified by the Contractor, except at the direction of USEPA. If a change of name or ownership occurs at the laboratory, the laboratory code will remain the same until the Contractor is directed by USEPA to use another laboratory code.

3.3.4 Case Number. The "Case No." is the SMO-assigned Case number associated with the sample, and reported on the Traffic Report/Chain of Custody Record.

3.3.5 Mod. Ref. Number. The "Mod. Ref. No." is the USEPA assigned number for analyses performed under the modified analysis clause in Exhibit A. If samples are to be analyzed under the modified analysis clause, the Contractor shall list both the Case No. and the modification reference number on all forms. If the analyses have no modified requirements, leave the "Mod. Ref. No." field blank.

3.3.6 SDG Number. The "SDG No." is the Sample Delivery Group (SDG) number. The SDG number is the EPA sample number of the first sample received in the SDG, except when this would cause duplication. When several samples are received together in the first SDG shipment, the SDG number shall be the lowest sample number (considering both alpha and numeric designations) in the first group of samples received under the SDG. If fractions of the same field samples are scheduled under different turnaround times, thus creating separate SDGs containing the same sample numbers, a different sample number shall be utilized in the assignment of the SDG number for each SDG. If a situation arises where there are an insufficient number of samples for assignment of SDG numbers, the contractor shall contact SMO for the assignment of a SDG number.

3.3.7 Sample Number. The "EPA Sample No." appears either in the header information of the form or as the left column of a table summarizing data from a number of samples. When an EPA sample number is entered in the box in the upper right-hand corner of a form, it shall be centered.

3.3.7.1 **All** samples, matrix spikes, post digestion/distillation spikes, duplicates, and serial dilutions shall be identified with an EPA sample number. For samples, an EPA sample number is the unique identifying number given in the Traffic Report/Chain of Custody Record that accompanied that sample. In order to facilitate data assessment, the sample suffixes listed in Exhibit B, Table 2 - Codes for Labeling Data, must be used.

3.3.8 Matrix. For "Matrix", enter "Soil" for soil/sediment samples, "Water" for water samples, "Wipe" for surface wipes, and "Filter" for air filter samples.

3.3.9 Rounding Rule. For rounding off numbers to the appropriate level of precision, observe the following common rules. If the figure following those to be retained is greater than or equal to 5, the absolute value of the result is to be rounded up; otherwise the absolute value of the result is rounded down. For example, -0.4365 rounds to -0.437 and -2.3564 rounds to -2.356. Also see "Rounding Rules" in Exhibit G.

3.3.9.1 Before evaluating a number for being in control or out of control of a certain limit [other than the Contract Required Quantitation Limit (CRQL)], the number evaluated shall be rounded using the above rounding rules to the significance reported for that limit. For example, the control limit for an Initial Calibration Verification is plus or minus 10% of the true value. Then a calculated percent recovery of 110.46 shall be reported on Form IIA-IN as 110, which is within the control limits of 90-110. On the other hand, a calculated percent recovery of 110.50 shall be reported on Form IIA-IN as 111, which is not within the 90-110 percent control limits.

NOTE: All results shall be transcribed to Inorganic Forms IIA-IN through XV-IN from the instrument raw data to two significant figures if the value is less than 10, or three significant figures if the value is greater than or equal to 10 as described in Exhibits B and H. The raw data result is to be rounded only when the number of figures in the raw data result exceeds the maximum number of figures specified for that result entry for that form. The instrument raw data files contain the raw data values. The hardcopy raw data may be a rounded or truncated representation of the instrument raw data.

3.4 Inorganic Forms

3.4.1 Cover Page - [COVER PAGE]

3.4.1.1 Purpose. This form is used to list all samples analyzed within an SDG and provide certain analytical information and general comments. It is also the document that is signed by the Laboratory Manager to authorize and release all data and deliverables associated with the SDG.

3.4.1.2 Instructions. Complete the header information according to the instructions in Exhibit B, Section 3.3. Complete the remainder of the form using the following instructions.

3.4.1.2.1 For samples analyzed using this Statement of Work (SOW), enter "ILM06.X" for the SOW Number.

3.4.1.2.2 Enter an EPA sample number including spikes and duplicates of every sample analyzed within the SDG. Spikes shall contain an "S" suffix and duplicates a "D" suffix. These sample numbers shall be listed on the form in ascending alphanumeric order. Thus, if MA1111 is the lowest (considering both alpha and numeric characters) EPA sample number within the SDG, it would be entered in the first EPA sample number field. Samples would be listed below it, in ascending sequence - MA1111, MA1111D, MAB124, MAB125, MAC111, etc.

3.4.1.2.3 A maximum of 20 field sample numbers can be entered on this form. Submit additional Cover Pages, as appropriate, if the total number of samples, duplicates, and spikes in the SDG is greater than 22.

3.4.1.2.4 A Laboratory Sample ID may be entered for each EPA sample number. If a Laboratory Sample ID is entered, it shall be entered identically (for each EPA sample number) on all associated data.

3.4.1.2.5 Enter "Yes" or "No" in answer to each of the two questions concerning Inductively Coupled Plasma - Atomic Emission Spectroscopy (ICP-AES) and Inductively Coupled Plasma - Mass Spectrometry (ICP-MS) corrections. Each question shall be explicitly answered with a "Yes" or a "No". The third question shall be answered with a "Yes" or "No" if the answer to the second question is "Yes". It shall be left blank if the answer to the second question is "No".

3.4.1.2.6 Under "Comments", enter any statements relevant to the analyses performed under the SDG as a whole.

3.4.1.2.7 Each Cover Page shall be signed and dated, in original, by the Laboratory Manager or the Manager's designee to authorize the release and verify the contents of all data and deliverables associated with an SDG.

3.4.2 Inorganic Analysis Data Sheet [Forms IA-IN and IB-IN]

3.4.2.1 Purpose. These forms are used to tabulate and report sample analysis results for inorganic target analytes (see Exhibit C).

3.4.2.2 Instructions. Complete the header information according to the instructions in Exhibit B, Section 3.3. Complete the remainder of the form using the following instructions.

3.4.2.2.1 "Date Received" is the date (formatted MM/DD/YYYY) of sample receipt at the laboratory, as recorded on the Traffic Report/Chain of Custody Record [i.e., the Validated Time of Sample Receipt (VTSR)].

3.4.2.2.2 "% Solids" is the percent of solids on a weight-by-weight basis in the sample which is determined by drying the sample as specified in Exhibit D - Introduction to Analytical Methods, Section 1.6. Report to two significant figures if the value is less than 10, and to three significant figures if the value is greater than or equal to 10. If the percent solids is not required because the sample is fully aqueous, or is less than 1% solid, then leave blank.

3.4.2.2.3 Enter the appropriate concentration units (ug/L for water, mg/kg for soil, and ug for wipes and air filter). Entering "mg/kg" means "mg/kg dry weight" on this form.

3.4.2.2.4 Under the column labeled "Concentration", enter for each analyte, the value of the result [if the concentration or mass is greater than or equal to the Critical Level (L_c)] corrected for any dilutions; or, enter the Limit of Detection (L_d) for the analyte, adjusted if necessary and corrected for any dilutions, if the concentration is less than the Critical Level. The concentration or mass result shall be reported to two significant figures if the result is less than 10 or three significant figures if the value is greater than or equal to 10.

3.4.2.2.5 Under the columns labeled "C", "Q", and "M", enter result qualifiers as identified below. If additional qualifiers are used, their explicit definitions shall be included on the Cover Page in the "Comments" section.

Forms IA-IN and IB-IN include fields for three types of result qualifiers. These qualifiers shall be completed as follows:

3.4.2.2.5.1 C (Concentration) Qualifier. Enter "J" if the reported value was obtained from a reading that was less than the Limit of Quantitation (L_q) but greater than or equal to the Critical Level. If the reading was less than the Critical Level, a "U" shall be entered.

The Critical Level obtained for a given preparation method, analysis method, and instrument shall be used for qualification of the results for samples associated with that preparation method, analysis method, and instrument. Serial dilution and post-digestion spike results shall be qualified using the Critical Level and L_q values utilized for the corresponding field sample.

All three values (i.e., the instrument reading, L_q, and L_c) shall be converted to the same units prior to determining the appropriate C (Concentration) Qualifier.

NOTE: The water L_q (in ug/L) and the L_c obtained from direct analysis (Preparation Method "Not_Prepared") for a given analysis method and instrument shall be used to qualify the results of instrument QC standards that are not taken through a preparation procedure (e.g., ICB and CCB for ICP-AES).

3.4.2.2.5.2 Q Qualifier. Specified entries and their meanings are as follows:

E: The reported value is estimated due to the presence of interference. An explanatory note shall be included under "Comments" on the Cover Page (if the problem applies to all samples), or on the specific Form IA-IN or Form IB-IN (if it is an isolated problem).

N: Spiked sample recovery not within control limits.

*: Duplicate analysis not within control limits.

D: The reported value is from a dilution.

3.4.2.2.5.3 M (Analysis Method) Qualifier. Specified entries and their meanings are as follows:

P: ICP/AES

MS: ICP/MS

CV: Manual Cold Vapor Atomic Absorption (AA)for mercury

AV: Automated Cold Vapor AA for mercury

AS: Semi-Automated Spectrophotometric

C: Manual Spectrophotometric

3.4.2.2.6 A brief physical description of the sample, both before and after digestion, shall be reported in the fields for color (before and after), clarity (before and after), texture, and artifacts. For water samples, report color and clarity. For soil samples, report color, texture, and artifacts. The following descriptive terms are recommended:

- Color - red, blue, yellow, green, orange, violet, white, colorless, brown, grey, and black;
- Clarity - clear, cloudy, and opaque; and
- Texture - fine (powdery), medium (sand), and coarse (large crystals or rocks).

If artifacts are present, enter "Yes" in the artifacts field and describe the artifacts in the "Comments" field. If artifacts are not present, enter "No". Note any significant changes that occur during sample preparation (i.e., emulsion formation) in the "Comments" field. Enter any sample-specific comments concerning the analyte results in the "Comments" field. Also document raw instrument results that are less than minus the CRQL (-CRQL) in the "Comments" field and in the Sample Delivery Group (SDG) Narrative.

3.4.2.2.7 If more than two additional analytes were requested, submit Form IB-IN as appropriate.

3.4.3 Initial (ICV) and Continuing Calibration Verification (CCV) [Form IIA-IN]

3.4.3.1 Purpose. This form is used to report analyte recoveries from calibration verification solutions.

3.4.3.2 Instructions. Complete the header information according to the instructions in Exhibit B, Section 3.3. Complete the remainder of the form using the following instructions.

3.4.3.2.1 Enter the ICV Source and the CCV Source. Enter sufficient information to identify the manufacturer and the solution used.

Use additional Form(s) IIA-IN if more calibration verification sources were used.

3.4.3.2.2 Under "Initial Calibration Verification True", enter the value [in micrograms per Liter (ug/L)] of the concentration of each analyte in the ICV Solution.

3.4.3.2.3 Under "Initial Calibration Verification Found", enter the most recent value (in ug/L), of the concentration of each analyte measured in the ICV Solution.

3.4.3.2.4 Under "Initial Calibration Verification %R", enter the value (to the nearest whole number) of the percent recovery computed according to the following equation:

EQ. 1 ICV Percent Recovery

$$\%R = \frac{\text{Found(ICV)}}{\text{True(ICV)}} \times 100$$

WHERE, "True(ICV)" is the true concentration of the analyte in the ICV Solution and "Found(ICV)" is the found concentration of the analyte in the ICV Solution.

3.4.3.2.5 Under "Continuing Calibration Verification True", enter the value (in ug/L) of the concentration of each analyte in the CCV Solution.

3.4.3.2.6 Under "Continuing Calibration Verification Found", enter the value (in ug/L) of the concentration of each analyte measured in the CCV Solution.

NOTE: The form contains two "Continuing Calibration Verification Found" columns. The column to the left shall contain values for the first CCV, and the column to the right shall contain values for the second CCV.

3.4.3.2.7 If more than one Form IIA-IN is required to report multiple CCVs, then the column to the left on the second form shall contain values for the third CCV, the column to the right shall contain values for the fourth CCV, and so on.

3.4.3.2.8 Under "Continuing Calibration Verification %R", enter the value (to the nearest whole number) of the percent recovery computed according to the following equation:

EQ. 2 CCV Percent Recovery

$$\%R = \frac{\text{Found(CCV)}}{\text{True(CCV)}} \times 100$$

WHERE, "True(CCV)" is the true concentration of each analyte, and "Found(CCV)" is the found concentration of the analyte in the CCV Solution.

NOTE: The form contains two "Continuing Calibration Verification %R" columns. Entries to these columns shall follow the sequence detailed above for entries to the "Continuing Calibration Verification Found" columns.

3.4.3.2.9 Under "M", enter the method used, as explained in Exhibit B, Section 3.4.2.2.5.3.

3.4.3.2.10 If more than one wavelength/mass is used to analyze an analyte, submit additional Form(s) IIA-IN as appropriate.

3.4.3.2.11 The order of reporting ICVs and CCVs for each analyte shall follow the chronological order in which the standards were run. Start with the first Form IIA-IN and move from the left to the right, continuing to the following Form IIA-INs as appropriate. For instance, the first ICV for all analytes shall be reported on the first Form IIA-IN. In a run where three CCVs were analyzed, the first CCV shall be reported in the left CCV column on the first Form IIA-IN and the second CCV shall be reported in the right column of the same form. The third CCV shall be reported in the left CCV column of the second Form IIA-IN. On the second Form IIA-IN, the ICV column and the right CCV column shall be left empty in this example. In the previous example, if a second run for an analyte was needed, the ICV of that run shall be reported on a third Form IIA-IN and the CCVs follow in the same fashion as explained before. In the case where two wavelengths are used for an analyte, all ICV and CCV results of one wavelength from all runs shall be reported before proceeding to report the results of the second wavelength used.

3.4.4 Blanks [Form III-IN]

3.4.4.1 Purpose. This form is used to report analyte concentrations found in the Initial Calibration Blank (ICB), Continuing Calibration Blanks (CCB), and the Preparation Blank (PB).

3.4.4.2 Instructions. Complete the header information according to the instructions in Exhibit B, Section 3.3. Complete the remainder of the form using the following instructions.

3.4.4.2.1 Enter "Soil", "Water", "Wipe", or "Filter" as appropriate as the matrix of the PB. No abbreviations or other matrix descriptors may be used.

3.4.4.2.2 According to the matrix specified for the PB, enter the PB concentration units as "ug/L" for water, "mg/kg" for soil, or "ug/" for wipes and filters.

3.4.4.2.3 Under "Initial Calibration Blank", enter the concentration (in ug/L) of each analyte in the most recent ICB, as described in Exhibit B, Section 3.4.4.2.8, below.

3.4.4.2.4 For each calibration blank associated with a given method and instrument, enter "J" under the "C" qualifier field on Form III-IN if the absolute value of the analyte concentration is less than the L_q for water but greater than or equal to the L_c (in ug/L or converted to ug/L) that was obtained from direct analysis (Preparation Method "Not_Prepared") using that method and instrument.

For prepared calibration blanks (e.g., mercury), the L_q for water and the L_c (in ug/L or converted to ug/L) for the preparation method, analysis, and instrument shall be used.

Enter "U" if the absolute value of the analyte in the blank is less than the L_c (in ug/L) obtained from direct analysis or the preparation method.

3.4.4.2.5 Under "Continuing Calibration Blank 1", enter the concentration (in ug/L) of each analyte detected in the first required CCB analyzed after the ICB, as described in Exhibit B, Section 3.4.4.2.8, below. Enter any appropriate qualifier, as explained for the "Initial Calibration Blank", to the "C" qualifier column immediately following the "Continuing Calibration Blank 1" column.

3.4.4.2.6 If up to three CCBs were analyzed, complete the columns labeled "2" and "3" in accordance with the instructions for the "Continuing Calibration Blank 1" column. If more than three CCBs were analyzed, then complete additional Form(s) III-IN as appropriate.

3.4.4.2.7 Under "Preparation Blank", enter the concentration in ug/L for a water blank, mg/kg for a soil blank, or mass in ug for a wipe or filter blank, of each analyte in the PB, as described in Exhibit B, Section 3.4.4.2.8, below. Evaluate the absolute value of the analyte concentration to determine the appropriate concentration qualifier, as explained in Exhibit B, Section 3.4.2.2.5.1, and enter the qualifier in the "C" column immediately following the "Preparation Blank" column.

3.4.4.2.8 For all blanks, enter the concentration or mass (positive or negative) for each analyte, if the absolute value of the concentration or mass is greater than or equal to the appropriate L_c. Enter the L_d value for the analyte, if the absolute value of the concentration or mass is less than the appropriate L_c.

For example, arsenic has an L_c of 1.4 ug/L for Preparation Method "Not_Prepared" an L_d of 2.8 ug/L and a resulting L_q of 5.6 ug/L. Therefore, a CCB instrument reading of -4.2485 ug/L will be reported as -4.2J; a CCB instrument reading of -0.4356 ug/L will be reported as 2.80U; a CCB instrument reading of 4.3586 ug/L will be reported as 4.4J; and a CCB instrument reading of 0.1584 ug/L will be reported as 2.80U.

3.4.4.2.9 Under "M", enter the method used, as explained in Exhibit B, Section 3.4.2.2.5.3.

3.4.4.2.10 If more than one wavelength/mass is used to analyze an analyte, submit additional Form(s) III-IN as appropriate.

3.4.4.2.11 The order of reporting ICBs and CCBs for each analyte shall follow the chronological order in which the blanks were run starting with the first Form III-IN and moving from left to right and continuing to additional Forms III-IN. When multiple wavelengths are used for the analysis of one analyte, all the results of one wavelength shall be reported before proceeding to the next wavelength.

3.4.5 ICP-AES and ICP-MS Interference Check Sample (ICS) [Forms IVA-IN and IVB-IN]

3.4.5.1 Purpose. These forms are used to report ICS results for each ICP-AES or ICP-MS instrument used in SDG analyses.

3.4.5.2 Instructions. Complete the header information according to the instructions in Exhibit B, Section 3.3. Complete the remainder of the form using the following instructions. The instructions for Forms IVA-IN and IVB-IN are identical except where specified.

3.4.5.2.1 For "ICP Instrument ID", enter an identifier that uniquely identifies a specific instrument within the Contractor laboratory. No two ICP instruments within a laboratory may have the same ICP Instrument ID.

3.4.5.2.2 Enter "ICS Source" as explained in Exhibit B, Section 3.4.3.2.1. For USEPA solutions, include in the source name a number identifying it (e.g., EPA-LV87).

3.4.5.2.3 Under "True Sol. A", enter the true concentration (in ug/L) of each analyte present in Solution A. Enter "0" for each analyte with no specified true value in Solution A.

3.4.5.2.4 Under "True Sol. AB", enter the true concentration (in ug/L) of each analyte present in Solution AB. Enter "0" for each analyte with no specified true value in Solution AB.

3.4.5.2.5 Under "Initial Found Sol. A" on Form IVA-IN (ICP-AES), and "Found Sol. A" on Form IVB-IN (ICP-MS), enter the concentration (positive, negative, or zero, in ug/L). Enter the concentration of each analyte and interferent for ICP-AES and of each analyte for ICP-MS in the initial analysis of Solution A as required in Exhibit D.

3.4.5.2.6 Under "Initial Found Sol. A %R" on Form IVA-IN (ICP-AES), and "Found Sol. A %R" on Form IVB-IN (ICP-MS), enter the value (to the nearest whole number) of the percent recovery computed for true Solution A greater than zero according to the following equation:

EQ. 3 Initial Found Sol. A Percent Recovery

$$\%R = \frac{\text{Initial Found Solution A}}{\text{True Found Solution A}} \times 100$$

Leave the field blank if "True Solution A" equals zero.

3.4.5.2.7 Under "Initial Found Sol. AB" on Form IVA-IN (ICP-AES), and "Found Sol. AB" on Form IVB-IN (ICP-MS), enter the concentration (positive, negative, or zero, in ug/L) of each analyte and interferent for ICP-AES and of each analyte for ICP-MS in the initial analysis of Solution AB as required in Exhibit D.

3.4.5.2.8 Under "Initial Found Sol. AB %R" on Form IVA-IN (ICP-AES), and "Found Sol. AB %R" on Form IVB-IN (ICP-MS), enter the value (to the nearest whole number) of the percent recovery computed for True Solution AB greater than zero according to the following equation:

EQ. 4 Initial Found Sol. AB Percent Recovery

$$\%R = \frac{\text{Initial Found Solution AB}}{\text{True Solution AB}} \times 100$$

Leave the field blank if "True Solution AB" equals zero.

3.4.5.2.9 Under "Final Found Sol. A", enter the concentration (positive, negative, or zero, in ug/L) of each analyte and interferent for ICP-AES in the final analysis of Solution A as required in Exhibit D. ICP-MS analysis (Form IVB-IN) does not require a final analysis.

3.4.5.2.10 Under "Final Found Sol. A %R" enter the value (to the nearest whole number) of the percent recovery computed for true Solution A greater than zero according to the following equation:

EQ. 5 Final Found Sol. A Percent Recovery

$$\%R = \frac{\text{Final Found Solution A}}{\text{True Solution A}} \times 100$$

Leave the field blank if "True Solution A" equals zero.

3.4.5.2.11 Under "Final Found Sol. AB", enter the concentration (positive, negative, or zero, in ug/L) of each analyte and interferent for ICP-AES in the final analysis of Solution AB as required in Exhibit D. ICP-MS analysis (Form IVB-IN) does not require a final analysis.

3.4.5.2.12 For all found values of Solutions A and AB, enter the concentration (positive, negative, or zero) of each analyte and interferent at each wavelength used for analysis by ICP.

3.4.5.2.13 Under "Final Found Sol. AB %R", enter the value (to the nearest whole number) of the percent recovery computed for true Solution AB greater than zero according to the following equation:

EQ. 6 Final Found Sol. AB Percent Recovery

$$\%R = \frac{\text{Final Found Solution AB}}{\text{True Solution AB}} \times 100$$

Leave the field empty if "True Solution AB" equals zero.

NOTE: For ICP-AES (Form IVA-IN), for every initial solution reported there must be a final solution reported. However, the opposite is <u>not</u> true. If an ICS was required to be analyzed in the middle of a run, it shall be reported in the "Final Found" section of this form.

3.4.5.2.14 If more ICS analyses were required, submit additional Form(s) IVA-IN and/or IVB-IN as appropriate.

3.4.5.2.15 The order of reporting ICSs for each analyte shall follow the chronological order in which the standards were run, starting with the first Form IVA-IN and/or IVB-IN and continuing to the following Forms IV-IN as appropriate. When multiple wavelengths/masses are used for one analyte, all the results of one wavelength/mass shall be reported before proceeding to the next wavelength/mass.

3.4.6 Matrix Spike Sample Recovery [Form VA-IN]

3.4.6.1 Purpose. This form is used to report results for the pre-digest spike.

3.4.6.2 Instructions. Complete the header information according to the instructions in Exhibit B, Section 3.3. Complete the remainder of the form using the following instructions.

3.4.6.2.1 Indicate the appropriate matrix and concentration units (ug/L for water and mg/kg dry weight for soil) as explained in Exhibit B, Sections 2.5.2.1.1 and 3.3.8.

3.4.6.2.2 For "% Solids for Sample", enter the percent solids (see Exhibit B, Section 3.4.2.2.2) for the original sample of EPA sample number reported on the form. Note that this number must equal the one reported on Form IA-IN for that sample.

3.4.6.2.3 In the "EPA Sample No." box, enter an EPA sample number of the sample from which the spike results on this form were obtained. The number shall be centered in the box.

3.4.6.2.4 Under "Control Limit %R", enter "75-125" if the sample result is less than or equal to four times the spike added value. If the sample result is greater than four times the Spike Added (SA) value, leave this field empty.

3.4.6.2.5 Under "Spiked Sample Result (SSR)", enter the measured value, in appropriate units, for each relevant analyte in the matrix spike sample. Enter the value of the result (if the concentration is greater than or equal to the L_c) corrected for any dilutions; or enter the L_d for the analyte, adjusted if necessary and corrected for any dilutions if the concentration is less than the L_c. Enter any appropriate concentration qualifier, as explained in Exhibit B, Section 3.4.2.2.5.1, to the "C" qualifier column immediately following the "Spiked Sample Result (SSR)" column.

3.4.6.2.6 Under "Sample Result (SR)", enter the measured value for each required analyte in the sample (reported in "EPA Sample No." box) on which the matrix spike was performed. Enter the value of the result (if the concentration is greater than or equal to the L_c) corrected for any dilutions; or enter the L_d for the analyte, adjusted if necessary and corrected for any dilutions, if the concentration is less than the L_c. Enter any appropriate concentration qualifier, as explained in Exhibit B, Section 3.4.2.2.5.1, to the "C" qualifier column immediately following the "Sample Result (SR)" column.

3.4.6.2.7 Under "Spike Added (SA)", enter the value for the concentration of each analyte added to the sample. The same concentration units shall be used for "SSR", "SR", and "SA". If the "Spike Added" concentration is specified in the contract, the value added and reported shall be the specific concentration in appropriate units, corrected for spiked sample weight and percent solids (soils) or spiked sample volume (waters).

3.4.6.2.8 Under "%R", enter the value (to the nearest whole number) of the percent recovery for all spiked analytes computed according to the following equation:

EQ. 7 Spike Percent Recovery

$$\%R = \frac{SSR - SR}{SA} \times 100$$

Percent recovery shall be reported, whether it is negative, positive or zero.

A value of zero shall be used in calculations for "SSR" or "SR" if the analyte value is less than the L_c.

3.4.6.2.9 Under "Q", enter "N" if the Spike Recovery (%R) is out of the control limits (75-125) and the Sample Result (SR) is less than or equal to four times the SA.

3.4.6.2.10 Under "M", enter the method used (as explained in Exhibit B, Section 3.4.2.2.5.3) or enter "NR" if the analyte is not required in the spike.

3.4.6.2.11 If different samples were used for spike sample analysis of different analytes, additional Form(s) VA-IN shall be submitted for each sample as appropriate.

3.4.7 Post-Digestion Spike Sample Recovery [Form VB-IN]

3.4.7.1 Purpose. This form is used to report results for the post-digest spike recovery which is based upon the addition of a known quantity of analyte to an aliquot of the digested sample.

3.4.7.2 Instructions. Complete the header information according to the instructions in Exhibit B, Section 3.3. Complete the remainder of the form using the following instructions.

3.4.7.2.1 In the "EPA Sample No." box, enter an EPA sample number of the sample from which the spike results on this form were obtained. The number shall be centered in the box.

3.4.7.2.2 The "Control Limit %R" and "Q" fields shall be left blank until limits are established by USEPA. At that time, the Contractor will be informed how to complete these fields.

3.4.7.2.3 Under "Spiked Sample Result (SSR)", enter the measured value (in ug/L) for each analyte in the post-digest spike sample. This value shall not be corrected for any dilution or volume change. Enter the instrument measured value of the result (if the concentration is greater than or equal to the L_c); or enter the L_d for the analyte if the concentration is less than the L_c. Enter any appropriate concentration qualifier, as explained in Exhibit B, Section 3.4.2.2.5.1, to the "C" qualifier column immediately following the "Spiked Sample Result (SSR)" column.

3.4.7.2.4 Under "Sample Result (SR)", enter the measured value (in ug/L) for the concentration of each analyte in the sample (reported in "EPA Sample No." box) on which the spike was performed. This value shall not be corrected for any dilution or volume change. Enter the instrument measured value (if the concentration is greater than or equal to the L_c); or enter the L_d for the analyte if the concentration is less than the L_c. Enter any appropriate concentration qualifier, as explained in Exhibit B, Section 3.4.2.2.5.1, to the "C" qualifier column immediately following the "Sample Result (SR)" column.

3.4.7.2.5 Under "Spike Added (SA)", enter the value (in ug/L) for each analyte added to the sample. If the SA concentration is specified in the contract, the value added and reported shall be that specific concentration in appropriate units.

3.4.7.2.6 Under "%R", enter the value (to the nearest whole number) of the percent recovery for all spiked analytes computed according to EQ. 7 in Exhibit B, Section 3.4.6.2.8. Percent recovery shall be reported, whether it is negative, positive, or zero. A value of zero shall be substituted for "SSR" or "SR" if the analyte value is less than the MDL.

3.4.7.2.7 Under "M", enter the method used as explained in Exhibit B, Section 3.4.2.2.5.3, or enter "NR" if the spike was not required.

3.4.7.2.8 If different samples were used for spike sample analysis of different analytes, additional Form(s) VB-IN shall be submitted.

3.4.8 Duplicates [Form VI-IN]

3.4.8.1 Purpose. The duplicates form is used to report results of duplicate analyses. Duplicate analyses are required for percent solids values and all analyte results.

3.4.8.2 Complete the header information according to the instructions in Exhibit B, Section 3.3. Complete the remainder of the form using the following instructions.

3.4.8.2.1 Indicate the appropriate matrix and concentration units (ug/L for water and mg/kg dry weight for soil) as explained in Exhibit B, Sections 2.5.2.1.1 and 3.3.8.

3.4.8.2.2 For "% Solids for Sample", enter the percent solids (as explained in Exhibit B, Section 3.4.2.2.2) for the original sample of the EPA sample number reported on the form. Note that this number must equal the one reported on Form IA-IN for that sample.

3.4.8.2.3 For "% Solids for Duplicate", enter the percent solids (as explained in Exhibit B, Section 3.4.2.2.2) for the duplicate sample of the EPA sample number reported on the form.

3.4.8.2.4 In the "EPA Sample No." box, enter EPA sample number of the sample from which the duplicate sample results on this form were obtained. The number shall be centered in the box.

3.4.8.2.5 Under "Control Limit", enter the CRQL (in appropriate units, ug/L for water or mg/kg dry weight basis corrected for the original sample weight and percent solids) for the analyte if either the sample or duplicate value was less than 5 times the CRQL. If the sample and duplicate values were greater than or equal to 5 times the CRQL, or if the sample and duplicate values were less than the CRQL, leave the field empty.

3.4.8.2.6 Under "Sample (S)", enter the original measured value for the concentration of each analyte in the sample (reported in "EPA Sample No." box) on which a duplicate analysis was performed. Concentration units are those specified on the form. Enter the value of the result (if the concentration is greater than or equal to the L_c) corrected for any dilutions; or enter the L_d for the analyte, adjusted if necessary and corrected for any dilutions, if the concentration is less than the L_c. Enter any appropriate concentration qualifier, as explained in Exhibit B, Section 3.4.2.2.5.1, to the "C" qualifier column immediately following the "Sample (S)" column.

3.4.8.2.7 Under "Duplicate (D)", enter the measured value for each analyte in the duplicate sample. Concentration units are those specified on the form. Enter the value of the result (if the concentration is greater than or equal to the L_c) corrected for any dilutions; or enter the L_d for the analyte, adjusted if necessary and corrected for any dilutions, if the concentration is less than the L_c. Enter any appropriate concentration qualifier, as explained in Exhibit B, Section 3.4.2.2.5.1, to the "C" qualifier column immediately following the "Duplicate (D)" column.

3.4.8.2.8 For solid samples, the concentration of the original sample shall be computed using the weight and percent solids of the original sample. The concentration of the duplicate sample shall be computed using the weight of the duplicate sample, but the percent solids of the original sample.

3.4.8.2.9 Under "RPD", enter the absolute value (to the nearest whole number) of the Relative Percent Difference (RPD) for all analytes detected above the L_c in either the sample or the duplicate, computed according to the following equation:

EQ. 8 Duplicate Sample Relative Percent Difference

$$RFD = \frac{\left| S - D \right|}{(S + D)/2} \times 100$$

A value of zero shall be substituted for "S" or "D" if the analyte concentration is less than the L_c in either one. If the analyte concentration is less than the L_c in both "S" and "D", leave the "RPD" field empty.

3.4.8.2.10 Under "Q", enter "*" if the duplicate analysis for the analyte is out of control. If both sample and duplicate values are greater than or equal to 5 times the CRQL, then the RPD must be less than or equal to 20% to be in control. If either the sample or duplicate value is less than 5 times the CRQL, then the absolute difference between the sample and duplicate values shall be less than the CRQL to be in control.

3.4.8.2.11 If both values are below the CRQL, then no control limit is applicable.

3.4.8.2.12 Under "M", enter method used as explained in Exhibit B, Section 3.4.2.2.5.3.

3.4.9 Laboratory Control Sample [Form VII-IN]

3.4.9.1 Purpose. This form is used to report results for the solid, aqueous, wipe, and filter LCSs.

3.4.9.2 Instructions. Complete the header information according to the instructions in Exhibit B, Section 3.3. Complete the remainder of the form using the following instructions.

3.4.9.2.1 Under "True", enter the value (in ug/L for aqueous, mg/kg for soil, or ug for wipes and filters) of the concentration of each analyte in the LCS.

3.4.9.2.2 Under "Found", enter the measured mass or concentration (in ug/L, mg/kg or ug as appropriate) of each analyte found in the LCS solution.

3.4.9.2.3 Under "%R", enter the value of the percent recovery (to the nearest whole number) computed according to the following equation:

EQ. 9 LCS Percent Recovery

$$\%R = \frac{\text{LCS Found}}{\text{LCS True}} \times 100$$

3.4.9.2.4 If the analyte concentration is less than the L_c, a value of zero shall be substituted for the LCS found.

3.4.9.2.5 Submit additional Form(s) VII-IN as appropriate if more than one LCS was required.

3.4.10 ICP-AES and ICP-MS Serial Dilutions [Form VIII-IN]

3.4.10.1 Purpose. This form is used to report results for ICP-AES and ICP-MS serial dilutions.

3.4.10.2 Instructions. Complete the header information according to the instructions in Exhibit B, Section 3.3. Complete the remainder of the form using the following instructions.

3.4.10.2.1 In the "EPA Sample No." box, enter EPA sample number of the sample for which serial dilution analysis results on this form were obtained. The number shall be centered in the box.

3.4.10.2.2 Under "Initial Sample Result (I)", enter the instrument measured concentration value (in ug/L) for each ICP analyte. This value shall not be corrected for any dilution. Enter the instrument measured value (if the concentration is greater than or equal to the L_c); or enter the L_d if the concentration is less than the L_c. Enter any appropriate concentration qualifier, as explained in Exhibit B, Section 3.4.2.2.5.1, to the "C" qualifier column immediately following the "Initial Sample Result (I)" column.

NOTE: The initial sample concentration for an analyte does not have to equal the value for that analyte reported on Form IA-IN for that sample. It is the value of the analyte's instrument measured concentration value (uncorrected for dilution) that is within the calibrated range of the instrument.

3.4.10.2.3 Under "Serial Dilution Result (S)", enter the instrument measured value corrected for a five-fold dilution (in ug/L) for each ICP analyte in the diluted sample. Enter the corrected instrument measured value (if the concentration is greater than or equal to the L_c); or enter the L_d if the concentration is less than the L_c. Enter any appropriate concentration qualifier, as explained in Exhibit B, Section 3.4.2.2.5.1, to the "C" qualifier column immediately following the "Serial Dilution Result (S)" column.

NOTE: The "Serial Dilution Result (S)" is obtained by multiplying by five the instrument measured concentration value (in ug/L) of the serially diluted sample. The "C" qualifier for the serial dilution shall be established based on the serial dilution result before correcting it for the five-fold dilution regardless of the value reported on Form VIII-IN.

For example, if the instrument readout value for the "Initial Sample Result (I)" for silver in a two-fold diluted sample MAX123 is 1164.36 ug/L, and the instrument readout value for the "Serial Dilution Result (S)" for silver in a ten-fold diluted sample MAX123 (MAX123L) is 241.67 ug/L, then the concentration reported for silver in the "Initial Sample Result (I)" column will be 1160 ug/L (not 2 times the instrument readout value which equals 2328.72 ug/L), and the concentration reported for silver in the "Serial Dilution Result (S)" column will be five times the instrument readout value which equals 1210 ug/L (not 10 times the instrument readout value which equals 2416.70 ug/L).

3.4.10.2.4 Under "% Difference", enter the absolute value (to the nearest whole number) of the percent difference in concentration of required analytes, between the original sample and the diluted sample (adjusted for dilution) according to the following formula:

EQ. 10 Serial Dilution Percent Difference

$$\% \text{ Difference} = \frac{\left| I - S \right|}{I} \times 100$$

A value of zero shall be substituted for "S" if the analyte concentration is less than the L_c. If the analyte concentration in (I) is less than the L_c concentration, leave the "% Difference" field empty.

3.4.10.2.5 Under "Q", enter "E" if the percent difference is greater than 10% and the original sample concentration (reported on Form IA-IN) is greater than 50 times the L_c reported on Form IX-IN.

3.4.10.2.6 Under "M", enter the method of analysis for each analyte as explained in Exhibit B, Section 3.4.2.2.5.3.

3.4.11 Critical Level and Limit of Detection (Quarterly) [Form IX-IN]

3.4.11.1 Purpose. This form documents the Critical Level (L_c) and the Limit of Detection (L_d) for each preparation method and instrument that the Contractor used to obtain data for the SDG. Only the methods, instruments, and wavelengths used to generate data for the SDG shall be included. The Contractor shall also report L_c and L_d, obtained from direct analysis, for each instrument used to obtain data for the SDG. The L_cs and L_ds obtained from direct analysis shall be used in the qualification of data associated with samples and instrument QC standards that are not taken through a preparation procedure. Although the L_cs and L_ds are determined quarterly, a copy of the quarterly L_cs and L_ds shall be included with each Sample Data Package on Forms IX-IN.

3.4.11.2 Instructions. Complete the header information according to the instructions in Exhibit B, Section 3.3. Complete the remainder of the form using the following instructions.

3.4.11.2.1 Enter the Analysis Method qualifier as specified in Exhibit B, Section 3.4.2.2.5.3, in the "Instrument Type:" field.

3.4.11.2.2 Enter the Instrument ID in the "Instrument ID:" field. These instrument IDs are used to uniquely identify each instrument that the laboratory used to perform the analysis.

3.4.11.2.3 Enter the date (formatted MM/DD/YYYY) on which the L_c and L_d calculation was updated in the "Date" field.

3.4.11.2.4 For "Preparation Method:", enter the method of preparation for which the L_cs and L_ds listed on Form IX-IN were established. Use appropriate sample preparation names as specified below:

Hotplate_AES_Water
Hotplate_MS_Water
Microwave_AES_Water_1
Microwave_AES_Water_2
Hotplate_AES_Soil_1
Hotplate_AES_Soil_2
Hotplate_AES_Wipe
Hotplate_AES_Filter
Hotplate_MS_Soil
Microwave_AES_Soil
Manual_Cold_Vapor_Water
Manual_Cold_Vapor_Soil_1
Manual_Cold_Vapor_Soil_2
Automated_Cold_Vapor_Water
Distillation_Water
Midi-distillation_Water
Micro-distillation_Water
Distillation_Soil
Midi-distillation_Soil
Micro-distillation_Soil
Not_Prepared

3.4.11.2.5 Enter the concentration units (ug/L for water, mg/kg for soil, or ug for wipes and filters) for the results reported on Form IX-IN in the "Concentration Units" field. Enter "ug/L" for L_c and L_d results obtained from direct analysis (Preparation Method "Not_Prepared").

3.4.11.2.6 Under "Wavelength/Mass", enter the wavelength in nanometers (nm) or the mass in atomic mass units (amu) for each analyte for which a L_c and L_d has been established and is listed in the appropriate column. If more than one wavelength or mass is used for an analyte, use additional Form(s) IX-IN as appropriate to report the MDL.

3.4.11.2.7 Under "L_c", enter the L_c (in ug/L for water and direct analysis, mg/kg for soil, and ug for wipes and filters, to two significant figures for values less than 10, and three significant figures for values greater than or equal to 10) as determined by the Contractor for each analyte analyzed by the instrument for which the ID is listed on this form. When calculating L_c values, always round up to the appropriate significant figure. This deviation from the rounding rules is necessary to prevent the reporting of detected values for results that fall in the noise region of the calibration.

3.4.11.2.8 Under "L_d", enter the L_d (in ug/L for water and direct analysis, mg/kg for soil, and in ug/L for wipes and filters, to two significant figures for values less than 10, and three significant figures for values greater than or equal to 10) as determined by the Contractor for each analyte analyzed by the instrument for which the ID is listed on this form. When calculating L_d values, always round up to the appropriate significant figure (e.g., 14.81 rounds to 14.9 and 146.6 rounds to 147). This deviation from the rounding rule is necessary to prevent the reporting of detected values for results that fall in the noise region of the calibration curve.

NOTE: Zeros used to set the decimal point in a number less than one are not significant but all trailing zeros are significant.

For example, a calculated L_d value of 0.074 ug/L will be reported as 0.074 and a calculated L_d value of 0.1 or 0.08 will be reported as 0.10 and 0.080, respectively.

3.4.11.2.9 Use additional Form(s) IX-IN if more preparation methods, instruments and wavelengths or masses are used. Note that the date on this form shall not exceed the analysis dates in the Sample Data Package or precede them by more than three months.

3.4.11.2.10 Use the "Comments" section to indicate alternative wavelengths and the conditions under which they are used.

3.4.12 ICP-AES Interelement Correction Factors (Annually) [Form XA-IN]

3.4.12.1 Purpose. This form documents for each ICP-AES instrument the interelement correction factors applied by the Contractor to obtain data for the SDG. Although the correction factors are determined annually, a copy of the results of the annual interelement correction factors shall be included with each Sample Data Package on Form XA-IN and Form XB-IN as appropriate.

3.4.12.2 Instructions. Complete the header information according to instructions in Exhibit B, Section 3.3. Complete the remainder of the form using the following instructions.

3.4.12.2.1 Enter the ICP-AES Instrument ID, which is a unique number designated by the Contractor to identify each ICP-AES instrument used to produce data in the Sample Data Package. If more than one ICP-AES instrument is used, submit additional Form(s) XA-IN as appropriate.

3.4.12.2.2 Report the date (formatted as MM/DD/YYYY) on which these correction factors were determined for use.

3.4.12.2.3 Under "Wavelength", list the wavelength in nm used for each ICP-AES analyte. If more than one wavelength is used, submit additional Form(s) XA-IN or Form(s) XB-IN as appropriate.

3.4.12.2.4 Under "Al", "Ca", "Fe", and "Mg", enter the correction factor (negative, positive or zero) for each ICP-AES analyte. Correction factors for one other analyte shall be reported using the empty column and listing the analyte's chemical symbol in the blank two-space header field provided for that column.

3.4.12.2.5 If corrections are not applied for an analyte, a zero shall be entered for that analyte to indicate that the corrections were determined to be zero. Correction factors for more than one additional analyte shall be reported using Form XB-IN.

NOTE: Correction factors for Al, Ca, Fe, and Mg are all required and are to be listed first (as they appear on Form XA-IN).

3.4.13 ICP-AES Interelement Correction Factors (Annually) [Form XB-IN]

3.4.13.1 Purpose. This form is used if correction factors for analytes other than Al, Ca, Fe, Mg, and one more analyte of the Contractor's choice were applied to the analytes analyzed by ICP-AES.

3.4.13.2 Instructions. Complete this form following the instructions for Form XA-IN (see Exhibit B, Section 3.4.12) by listing the chemical symbol for additional analytes in the heading of the empty columns in the two-space fields provided.

3.4.13.2.1 Columns of correction factors for additional analytes shall be entered left to right starting on Form XA-IN and proceeding to Form XB-IN, according to the alphabetical order of their chemical symbols.

3.4.14 Limit of Quantitation (L_q)(Quarterly) [Form XI-IN]

3.4.14.1 Purpose. This form documents the quarterly Limit of Quantitation for each instrument that the Contractor used to obtain data for the SDG.

3.4.14.2 Instructions. Complete the header information according to the instructions in Exhibit B, Section 3.3. Complete the remainder of the form using the following instructions.

3.4.14.2.1 Enter the Instrument ID, which is a unique number designated by the Contractor to identify each instrument used to produce data for the SDG. If more than one instrument, preparation method, or analysis method is used, submit additional Form(s) XI-IN as appropriate.

3.4.14.2.2 For "Preparation Method:", enter the method of preparation as specified in Exhibit B, Section 3.4.11.2.4.

3.4.14.2.3 For "Analysis Method:", enter the method code according to the specifications in Exhibit B, Section 3.4.2.2.5.3.

3.4.14.2.4 Report the date (formatted as MM/DD/YYYY) on which these Limits of Quantitation were calculated.

3.4.14.2.5 Under "Integ. Time (Sec.)", enter the integration time (in seconds) used for each measurement taken from an ICP instrument.

3.4.14.2.6 Under "L_q", enter the concentration (in ug/L for water, mg/kg for soil, and ug for wipes and filters) that is the limit of the method instrument as specified in Exhibit D.

3.4.14.2.7 Contract Required Quantitation Limits (in ug/L for water, mg/kg for soil, and ug for wipes and filters) as established in Exhibit C, shall be reported in the column headed "CRQL". The CRQL shall be reported in ug/L on Form(s) XI-IN associated with Preparation Method "Not_Prepared".

3.4.14.2.8 If more instruments or analyte wavelengths/masses are used, submit additional Form(s) XI-IN as appropriate.

3.4.15 Preparation Log [Form XII-IN]

3.4.15.1 Purpose. This form is used to report the preparation run log.

3.4.15.1.1 All field samples and all Quality Control (QC) preparations (including duplicates, matrix spikes, LCSs, PBs, and re-preparations) associated with the SDG shall be reported on Form XII-IN. In addition, for mercury analyses, all prepared calibration standards and QC standards (e.g., ICV, CCV, ICB, CCB) shall also be reported on Form XII-IN. For cyanide analyses, the distilled ICV, the mid-range standard, and any distilled calibration standards shall also be reported on Form XII-IN.

3.4.15.1.2 Submit one Form XII-IN per batch, per method, if no more than thirty-two preparations, including QC preparations, were performed. If more than 32 preparations per batch, per method, were performed, then submit additional copies of Form XII-IN as appropriate. Submit a separate Form XII-IN for each batch.

3.4.15.1.3 The order in which the Preparation Logs are submitted is very important. Form XII-IN shall be organized by method, by batch. Later batches within a method shall follow earlier ones. Each batch shall start on a separate Form XII-IN.

3.4.15.2 Instructions. Complete the header information according to the instructions in Exhibit B, Section 3.3. Complete the remainder of the form using the following instructions.

3.4.15.2.1 For "Preparation Method", enter the method of preparation for which the preparations listed on Form XII-IN were made, as specified in Exhibit B, Section 3.4.11.2.4.

3.4.15.2.2 Under "EPA Sample No.", enter EPA sample number of each sample in the SDG, and of all other preparations such as duplicates, matrix spikes, LCSs, PBs, and re-preparations (all formatted according to Exhibit B, Table 2). Enter any digested/distilled calibration or QC standards. All EPA sample numbers shall be listed in ascending alphanumeric order, continuing to the next Form XII-IN if applicable.

3.4.15.2.3 Under "Preparation Date", enter the date (formatted MM/DD/YYYY) on which each sample was prepared for analysis by the method indicated in the header section of the form.

NOTE: The date never changes on a single Form XII-IN because the form shall be submitted per batch.

3.4.15.2.4 Under "Initial Weight/Volume", enter the wet weight (in grams) of each soil sample or the initial volume (in mL) of each water sample prepared for analysis by the method indicated in the header section of the form.

3.4.15.2.5 Under "Volume", enter the final volume (in mL) of the preparation for each sample prepared for analysis by the method indicated in the header section of the form. This field shall have a value for each sample listed.

3.4.16 Analysis Run Log [Form XIII-IN]

3.4.16.1 Purpose. This form is used to report the sample analysis run log.

3.4.16.1.1 A run is defined as the totality of analyses performed by an instrument throughout the sequence initiated by, and including, the first SOW-required calibration standard or tune standard, and terminated by, and including, the CCV and CCB following the last SOW-required analytical sample.

3.4.16.1.2 All field samples and all QC analyses (including tunes, calibration standards, ICVs, CCVs, ICBs, CCBs, ICSs, LCSs, PBs, duplicates, serial dilutions, matrix spikes, and post-digestion/distillation spikes) associated with the SDG shall be reported on Form XIII-IN. The run shall be continuous and inclusive of all analyses performed on the particular instrument during the run.

3.4.16.1.3 Submit one Form XIII-IN per run if no more than thirty-two (32) analyses, including instrument calibration, were analyzed in the run. If more than thirty-two analyses were performed in the run, submit additional Form(s) XIII-IN as appropriate.

3.4.16.1.4 The order in which the Analysis Run Logs are submitted is very important. Form XIII-IN shall be organized by method, and by run. Later runs within a method shall follow earlier ones. Each analytical run shall start on a separate Form XIII-IN. Therefore, instrument calibration or tune shall be the first entry on the form for each new run. In addition, the run is considered to have ended if it is interrupted for any reason, including termination for failing QC parameters.

3.4.16.2 Instructions. Complete the header information according to the instructions in Exhibit B, Section 3.3. Complete the remainder of the form using the following instructions.

3.4.16.2.1 For "Instrument ID", enter the Instrument ID which shall be an identifier designated by the Contractor to uniquely identify each instrument used to produce data which are required to be reported in the SDG deliverable. If more than one instrument is used, submit additional Form(s) XIII-IN as appropriate. The Instrument ID shall exactly match that reported on Forms IVA, IVB, IX, XA, XB, XI, XIV, and XV.

3.4.16.2.2 For "Analysis Method", enter the method code according to the specifications in Exhibit B, Section 3.4.2.2.5.3.

3.4.16.2.3 For "Start Date", enter the date (formatted MM/DD/YYYY) on which the analysis run was started.

3.4.16.2.4 For "End Date", enter the date (formatted MM/DD/YYYY) on which the analysis run was ended.

3.4.16.2.5 Under "EPA Sample No.", enter EPA sample number of each analysis, including all QC operations applicable to the SDG (formatted according to Exhibit B, Table 2). All EPA sample numbers shall be listed in increasing chronological (date and time) order of analysis, continuing to the next Form XIII-IN for the instrument run, if applicable. The analysis date and time of other analyses not associated with the SDG, but analyzed by the instrument in the reported analytical run, shall be reported. Those analyses shall be identified with EPA sample number of "ZZZZZZ".

3.4.16.2.6 Under "D/F", enter the dilution factor by which the final digestate or distillate needed to be diluted for each analysis to be performed. The dilution factor does not include the dilution inherent in the preparation as specified by the preparation procedures in Exhibit D.

3.4.16.2.7 The dilution factor is required for all entries on Form XIII-IN.

NOTE: For a particular sample a dilution factor of "1.0" shall be entered if the digestate or distillate was analyzed without adding any further volume of dilutant or any other solutions to the "Volume" or an aliquot of the "Volume" listed on Form XII-IN for that sample.

3.4.16.2.8 For USEPA supplied solutions such as ICVs and ICSs, a dilution factor shall be entered if the supplied solution had to be diluted to a dilution different from that specified by the instructions provided with the solution. The dilution factor reported in such a case shall be that which would make the reported true values on the appropriate form for the solution equal those that were supplied with the solution by USEPA. For instance, ICV-2(0887) has a true value of 104.0 ug/L at a 20-fold dilution. If the solution is prepared at a 40-fold dilution, a dilution factor of "2.0" shall be entered on Form XIII-IN and the uncorrected instrument reading is compared to a true value of 52 ug/L. In this example, Form IIA-IN will have a true value of 104.0 regardless of the dilution used. The found value for the ICV shall be corrected for the dilution listed on Form XIII-IN using the following formula:

EQ. 11 ICV/CCV Correction for Dilution

Found value on Form II = Instrument readout (ug/L) × D/F

3.4.16.2.9 Under "Time", enter the time (in military format - HHMM) at which each analysis was performed.

3.4.16.2.10 Under "Analytes", enter "X" in the column of the designated analyte to indicate that the analyte value was used from the reported analysis to report data in the SDG. Leave the column empty for each analyte if the analysis was not used to report the particular analyte.

3.4.16.2.11 Entering "X" appropriately is very important. The "X" is used to link the samples with their related QC. It also links the dilution factor with the appropriate result reported on Inorganic Forms I-VIII. For each analyte result reported on any of the Forms I-VIII, there shall be one, and only one, properly identified entry on Form XIII-IN for which an "X" is entered in the column for that analyte.

3.4.16.2.12 If, on Form XIII-IN, an "X" is entered in the column for an analyte for a field sample associated with a dilution factor greater than 1.0, flag the data for that analyte with a "D" on the appropriate Form IA-IN or Form IB-IN.

3.4.17 ICP-MS Tune [Form XIV-IN]

3.4.17.1 Purpose. This form is used to report the tuning results for each ICP-MS instrument used in SDG analyses.

3.4.17.2 Instructions. Complete the header information according to the instructions in Exhibit B, Section 3.3. Complete the remainder of the form using the following instructions.

3.4.17.2.1 For "ICP-MS Instrument ID", enter an identifier that uniquely identifies a specific instrument within the Contractor laboratory. No two ICP-MS instruments within a laboratory may have the same ICP-MS Instrument ID.

3.4.17.2.2 Report the date (formatted as MM/DD/YYYY) on which the ICP-MS tune was performed. This date shall not exceed the dates of analysis by ICP-MS in the Sample Data Package.

3.4.17.2.3 For "Avg. Measured Mass (amu)", enter the average mass calculated from the five or more tune integrations (in atomic mass units) measured for each isotope.

3.4.17.2.4 For "Avg. Peak Width (amu)" enter the average peak width calculated from the analysis (in atomic mass units) at the percent of peak height recommended by the instrument manufacturer for each isotope.

3.4.17.2.5 For "% Height", enter the percent of peak height at which the Average Peak Width was measured.

3.4.17.2.6 For "%RSD", enter the percent Relative Standard Deviation of the absolute signals (intensities) for each isotope calculated from the five or more tune integrations.

3.4.18 ICP-MS Internal Standards Relative Intensity Summary [Form XV-IN]

3.4.18.1 Purpose. This form is used to report the relative internal standard intensity levels during a run for ICP-MS. The relative intensity of each of the internal standards in all analyses performed by ICP-MS must be reported on the form. If more than one ICP-MS instrument or run is used, submit additional Form(s) XV-IN as appropriate. All runs for the lowest alphanumeric instrument must be reported in ascending order before proceeding to the runs for the next highest instrument.

3.4.18.2 Instructions. Complete the header information according to the instructions in Exhibit B, Section 3.3. Complete the remainder of the form using the following instructions.

3.4.18.2.1 For "ICP-MS Instrument ID", enter an identifier that uniquely identifies a specific instrument within the Contractor laboratory. No two ICP-MS instruments within a laboratory may have the same ICP-MS Instrument ID.

3.4.18.2.2 For "Start Date", enter the date (formatted MM/DD/YYYY) on which the analysis run was started.

3.4.18.2.3 For "End Date", enter the date (formatted MM/DD/YYYY) on which the analysis run was ended.

3.4.18.2.4 Under "EPA Sample No.", enter EPA sample number of each analysis, including all QC operations applicable to the SDG. All EPA sample numbers must be listed in increasing chronological (date and time) order of analysis, continuing to the next Form XV for the instrument run, if applicable. The order must agree with the order reported on Form XIII-IN for that run. The analysis date and time of other analyses not associated with the SDG, but analyzed by the instrument in the reported analytical run, must be reported. Those analyses must be identified with EPA sample number of "ZZZZZZ." Samples identified as "ZZZZZZ" need not have intensities reported for internal standards.

3.4.18.2.5 Under "Time", enter the time (in military format - HHMM) at which each analysis was performed.

3.4.18.2.6 Under "Internal Standards %RI for:", enter the chemical symbol and elemental expression number of the internal standard in the "Element" header field provided to indicate the internal standard and elemental expression for which the Relative Intensity (RI) of the internal standards will be calculated in that column.

3.4.18.2.6.1 In the "Element" column, enter the internal standard relative intensity (to the nearest whole number) of the internal standard for each sample analysis listed on the form (excluding "ZZZZZZ"). The internal standard relative intensity (%RI) is calculated using the following formula:

EQ. 12 Internal Standard Percent Relative Intensity

$$\%RI = \frac{I_n}{I_o} \times 100$$

WHERE, "I_o" is the intensity of the internal standard in the blank calibration standard and "I_n" is the intensity of the internal standard in the EPA sample number in the same units.

3.4.18.2.7 Under the "Q" column to the right of each "Element" column, enter an "R" if the %RI for a field sample, PE, duplicate, or spike is less than 60 or greater than 125; otherwise leave the field blank.

3.4.18.2.8 Columns of internal standard RI must be entered left to right starting with the internal standards of the lower mass on the first Form XV-IN and proceeding to the following Form XV-IN as appropriate. All Forms XV-IN for the lowest numeric instrument must be reported in ascending order by the run number before proceeding to the next Form XV.

3.4.18.3 All field samples and all QC samples (including calibration standards, ICVs, CCVs, ICBs, CCBs, ICSs, LCS, PB, serial dilutions, duplicates, PE samples, and spikes) associated with the SDG must be reported on Form XV-IN. The run must be continuous and inclusive of all analyses performed on the particular instrument during the run.

3.4.18.4 Submit one Form XV-IN per run if no more than 32 analyses, including instrument calibration, were analyzed in the run. If more than 32 analyses were performed in the run, submit additional Form(s) XV-IN as appropriate. Each new run must be started on the first line of Form XV-IN.

3.5 Sample Log-In Sheet [Form DC-1]

3.5.1 Purpose. This form is used to document the receipt and inspection of samples and containers. At least one original Form DC-1 is required for each sample shipping container (e.g., cooler). If the samples in a single sample shipping container must be assigned to more than one SDG, the original Form DC-1 shall be placed with the deliverables for the SDG of the lowest alpha-numeric number and a copy of Form DC-1 shall be placed with the deliverables for the other SDG(s). The copies should be identified as "copy(ies)", and the location of the original should be noted on the copies.

3.5.2 Instructions

3.5.2.1 Sign and date the airbill. (If an airbill is not received, include a hardcopy receipt requested from the shipping company or a printout of the shipping company's electronic tracking information).

3.5.2.2 Examine the shipping container and record the presence/absence of custody seals and their condition (i.e., intact, broken) in Item 1.

3.5.2.3 Record the custody seal numbers in Item 2.

3.5.2.4 Open the container, remove the enclosed sample documentation, and record the presence/absence of USEPA forms (i.e., Traffic Reports/Chain of Custody Records, packing lists) and airbills or airbill stickers in Items 3 and 4. Specify if there is an airbill present or an airbill sticker in Item 4. Record the airbill or sticker number in Item 5.

3.5.2.5 Remove the samples from the shipping container(s), examine the samples and the sample tags (if present), and record the condition of the sample bottles (i.e., intact, broken, leaking) and presence or absence of sample tags in Items 6 and 7.

3.5.2.6 Record the presence or absence of a cooler temperature indicator bottle in Item 8.

3.5.2.7 Record the cooler temperature in Item 9.

3.5.2.8 Review the sample shipping documents and compare the information recorded on all the documents and samples and mark the appropriate answer in Item 10.

3.5.2.9 The log-in date should be recorded at the top of Form DC-1; record the date and time of cooler receipt at the laboratory in Items 11 and 12.

3.5.2.10 If there are no problems observed during receipt, sign and date (include the time) Form DC-1 and Traffic Report/Chain of Custody Record, and write the sample numbers in the "EPA Sample No." column.

3.5.2.11 Record the pH for all aqueous samples received.

3.5.2.12 Record the appropriate sample tags and assigned laboratory numbers, if applicable.

3.5.2.13 Any comments should be made in the "Remarks" column.

3.5.2.14 Record the fraction designation (if appropriate) and the specific area designation (e.g., refrigerator number) in the "Sample Transfer" block located in the bottom left corner of Form DC-1. Sign and date the sample transfer block.

3.5.2.15 For Items 1, 3, 4, 6, 7, 8 and 10, circle the appropriate response. Responses can be underlined if this form is completed by automated equipment. Unused columns and spaces shall be crossed out, initialed, and dated.

3.5.2.16 If there are problems observed during receipt (including samples that have not been preserved to the proper pH) or an answer marked with an asterisk (e.g., "absent*") was circled, contact SMO and document the contact as well as resolution of the problem on a CLP Communication Log. Following resolution, sign and date the forms as specified in the preceding paragraph and note, where appropriate, the resolution of the problem.

3.6 Full Inorganics Complete SDG File (CSF) Inventory Sheet [Form DC-2]

3.6.1 Purpose. The CSF Inventory Sheet is used to record both the inventory of Complete SDG File (CSF) documents and the number of documents in the original Sample Data Package which is sent to the USEPA Region.

3.6.2 Instructions

3.6.2.1 Organize all EPA-CSF documents as described in Exhibit B, Sections 2 and 3. Assemble the documents in Exhibit B, Section 2 in the order specified on Form DC-2, and stamp each page with the consecutive number. Inventory the CSF by reviewing the document numbers and recording page number ranges in the columns provided on Form DC-2. The Contractor shall verify and record in the "Comments" section on Form DC-2 all intentional gaps in the page numbering sequence (for example, "page numbers not used, XXXX-XXXX, XXXX-XXXX"). If there are no documents for a specific document type, enter an "NA" in the empty space.

3.6.2.2 Certain laboratory-specific documents related to the CSF may not fit into a clearly defined category. The laboratory should review Form DC-2 to determine if it is most appropriate to place them under Categories 31, 32, 33, or 34. Category 34 should be used if there is no appropriate previous category. These types of documents should be described or listed in the blanks under each appropriate category.

3.6.2.3 If it is necessary to insert new or inadvertently omitted documents, the Contractor shall follow these steps:

- Number all documents to be inserted with the next sequential numbers and file the inserts in their logical positions within the CSF (e.g., file document 1000 between documents 6 and 7).
- Identify where the inserts are filed in the CSF by recording the document numbers and their locations under the "Other Records" section of Form DC-2 (e.g., document 1000 is filed between 6 and 7).

4.0 DATA REPORTING FORMS

The data reporting forms are shown on the following pages.

EXHIBIT B

INORGANIC FORMS

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USEPA - CLP

COVER PAGE

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ Mod. Ref. No.: _____ SDG No.: _____

SOW No.: _____

EPA Sample No.	Lab Sample ID

		ICP-AES	ICP-MS
Were ICP-AES and ICP-MS interelement corrections applied?	(Yes/No)		
Were ICP-AES and ICP-MS background corrections applied?	(Yes/No)		
If yes, were raw data generated before application of background corrections?	(Yes/No)		

Comments:

_____

_____

_____

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy Sample Data Package and in the electronic data submitted has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: _____ Name: _____

Date: _____ Title: _____

USEPA - CLP

1A-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ Mod. Ref. No.: _____ SDG No.: _____

Matrix: _____ Lab Sample ID: _____

% Solids: _____ Date Received: _____

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight):

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony				
7440-38-2	Arsenic				
7440-39-3	Barium				
7440-41-7	Beryllium				
7440-43-9	Cadmium				
7440-70-2	Calcium				
7440-47-3	Chromium				
7440-48-4	Cobalt				
7440-50-8	Copper				
7439-89-6	Iron				
7439-92-1	Lead				
7439-95-4	Magnesium				
7439-96-5	Manganese				
7439-97-6	Mercury				
7440-02-0	Nickel				
7440-09-7	Potassium				
7782-49-2	Selenium				
7440-22-4	Silver				
7440-23-5	Sodium				
7440-28-0	Thallium				
7440-62-2	Vanadium				
7440-66-6	Zinc				
57-12-5	Cyanide				

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

USEPA - CLP

1B-IN

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ Mod. Ref. No.: _____ SDG No.: _____

Matrix: _____ Lab Sample ID: _____

% Solids: _____ Date Received: _____

Concentration Units (**ug/L**, **ug**, or **mg/kg** dry weight):

CAS No.	Analyte	Concentration	C	Q	M

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

USEPA - CLP

2A-IN

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ Mod. Ref. No.: _____ SDG No.: _____

Initial Calibration Verification Source: _____

Continuing Calibration Verification Source: _____

Concentration Units: ug/L

	Initial Calibration Verification			Continuing Calibration Verification					M
Analyte	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide									

(1) Control Limits: Mercury 85-115; Other Metals 90-110; Cyanide 85-115

USEPA - CLP

3-IN

BLANKS

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ Mod. Ref. No.: _____ SDG No.: _____

Preparation Blank Matrix (soil/water/wipe/filter): _____

Preparation Blank Concentration Units (ug/L, ug, or mg/kg): _____

Analyte	Initial Calibration Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank		
		C	1	C	2	C	3	C		C	M
Aluminum											
Antimony											
Arsenic											
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead											
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium											
Selenium											
Silver											
Sodium											
Thallium											
Vanadium											
Zinc											
Cyanide											

USEPA - CLP

4A-IN

ICP-AES INTERFERENCE CHECK SAMPLE

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ Mod. Ref. No.: _____ SDG No.: _____

ICP-AES Instrument ID: _____ ICS Source: _____

Concentration Units: ug/L

Analyte	True		Initial Found				Final Found			
	Sol. A	Sol. AB	Sol. A	%R	Sol. AB	%R	Sol. A	%R	Sol. AB	%R
Aluminum										
Antimony										
Arsenic										
Barium										
Beryllium										
Cadmium										
Calcium										
Chromium										
Cobalt										
Copper										
Iron										
Lead										
Magnesium										
Manganese										
Nickel										
Potassium										
Selenium										
Silver										
Sodium										
Thallium										
Vanadium										
Zinc										

USEPA - CLP

4B-IN

ICP-MS INTERFERENCE CHECK SAMPLE

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ Mod. Ref. No.: _____ SDG No.: _____

ICP-MS Instrument ID: _____ ICS Source: _____

Concentration Units: ug/L

Analyte	True		Found			
	Sol. A	Sol. AB	Sol. A	%R	Sol. AB	%R
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Cadmium						
Calcium						
Carbon						
Chloride						
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Magnesium						
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silver						
Sodium						
Sulfur						
Thallium						
Titanium						
Vanadium						
Zinc						

USEPA - CLP

5A-IN

MATRIX SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ Mod. Ref. No.: _____ SDG No.: _____

Matrix: _____

% Solids for Sample: _____

Concentration Units (ug/L or mg/kg dry weight): _____

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide									

Comments:

_____

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USEPA - CLP

5B-IN

POST-DIGESTION SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ Mod. Ref. No.: _____ SDG No.: _____

Matrix: _____

Concentration Units: ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide									

Comments:

_____

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USEPA - CLP
6-IN
DUPLICATES

EPA SAMPLE NO.

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ Mod. Ref. No.: _____ SDG No.: _____

Matrix: _____

% Solids for Sample: _____ % Solids for Duplicate: _____

Concentration Units (ug/L or mg/kg dry weight): _____

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum								
Antimony								
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead								
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								
Cyanide								

USEPA - CLP

7-IN

LABORATORY CONTROL SAMPLE

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ Mod. Ref. No.: _____ SDG No.: _____

Analyte	Aqueous (ug/L), soil (mg/kg), Wipe/Filter (ug)		
	True	Found	%R
Aluminum			
Antimony			
Arsenic			
Barium			
Beryllium			
Cadmium			
Calcium			
Chromium			
Cobalt			
Copper			
Iron			
Lead			
Magnesium			
Manganese			
Mercury			
Nickel			
Potassium			
Selenium			
Silver			
Sodium			
Thallium			
Vanadium			
Zinc			
Cyanide			

USEPA - CLP

8-IN

ICP-AES AND ICP-MS SERIAL DILUTIONS

EPA SAMPLE NO.

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ Mod. Ref. No.: _____ SDG No.: _____

Matrix: _____

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum							
Antimony							
Arsenic							
Barium							
Beryllium							
Cadmium							
Calcium							
Chromium							
Cobalt							
Copper							
Iron							
Lead							
Magnesium							
Manganese							
Nickel							
Potassium							
Selenium							
Silver							
Sodium							
Thallium							
Vanadium							
Zinc							

USEPA - CLP

9-IN

CRITICAL LEVEL (L_c) AND LIMIT OF DETECTION (L_d) (QUARTERLY)

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ Mod. Ref. No.: _____ SDG No.: _____

Instrument Type: _____ Instrument ID: _____ Date: _____

Preparation Method: _____

Concentration Units (ug/L, mg/kg, or ug): _____

Analyte	Wavelength/Mass	L_c	L_d
Aluminum			
Antimony			
Arsenic			
Barium			
Beryllium			
Cadmium			
Calcium			
Chromium			
Cobalt			
Copper			
Iron			
Lead			
Magnesium			
Manganese			
Mercury			
Nickel			
Potassium			
Selenium			
Silver			
Sodium			
Thallium			
Vanadium			
Zinc			
Cyanide			

Comments:

_____

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_____

USEPA - CLP

10A-IN

ICP-AES INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ Mod. Ref. No.: _____ SDG No.: _____

ICP-AES Instrument ID: _____ Date: _____

Analyte	Wave-length (nm)	Interelement Correction Factors for: Al	Ca	Fe	Mg	____
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Magnesium						
Manganese						
Nickel						
Potassium						
Selenium						
Silver						
Sodium						
Thallium						
Vanadium						
Zinc						

Comments:

_____

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_____

USEPA - CLP

10B-IN

ICP-AES INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ Mod. Ref. No.: _____ SDG No.: _____

ICP-AES Instrument ID: _____ Date: _____

Analyte	Wave-length (nm)	Interelement Correction Factors for: _____	_____	_____	_____	_____
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Magnesium						
Manganese						
Nickel						
Potassium						
Selenium						
Silver						
Sodium						
Thallium						
Vanadium						
Zinc						

Comments:

_____

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USEPA - CLP

11-IN

LIMIT OF QUANTITATION (L_Q) (QUARTERLY)

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ Mod. Ref. No.: _____ SDG No.: _____

Instrument ID: _____ Date: _____

Preparation Method: _____ Analysis Method: _____

Analyte	Integ. Time (Sec.)	L_q	CRQL
Aluminum			
Antimony			
Arsenic			
Barium			
Beryllium			
Cadmium			
Calcium			
Chromium			
Cobalt			
Copper			
Iron			
Lead			
Magnesium			
Manganese			
Mercury			
Nickel			
Potassium			
Selenium			
Silver			
Sodium			
Thallium			
Vanadium			
Zinc			
Cyanide	--		

Comments:

_____

_____

_____

USEPA - CLP

12-IN

PREPARATION LOG

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ Mod. Ref. No.: _____ SDG No.: _____

Preparation Method: _____

EPA Sample No.	Preparation Date	Initial Weight/Volume (g) or (mL)	Final Volume (mL)

USEPA - CLP

13-IN

ANALYSIS RUN LOG

Lab Name: ______________________________ Contract: ______________________________

Lab Code: __________ Case No.: ____________ Mod. Ref. No.: ________ SDG No.: _______

Instrument ID: ______________________________ Date: ______________________________

Start Date: ______________________________ End Date: ______________________________

EPA Sample No.	D/F	Time	Analytes																									
			Al	Sb	As	Ba	Be	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Hg	Ni	K	Se	Ag	Na	Tl	V	Zn	CN		

USEPA - CLP

14-IN

ICP-MS TUNE

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ Mod. Ref. No.: _____ SDG No.: _____

ICP-MS Instrument ID: _____ Date: _____

Element - Mass	Avg. Measured Mass (amu)	Average Peak Width (amu)	%Height	%RSD
Be - 9				
Mg - 24				
Mg - 25				
Mg - 26				
Co - 59				
In - 113				
In - 115				
Pb - 206				
Pb - 207				
Pb - 208				

Comments:

_____

_____

_____

USEPA - CLP

15-IN

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Lab Name: _____ Contract: _____

Lab Code: _____ Case No.: _____ Mod. Ref. No.: _____ SDG No.: _____

ICP-MS Instrument ID: _____ Start Date: _____ End Date: _____

EPA Sample No.	Time	Internal Standards %RI For:									
		Element	Q	Element	Q	Element	Q	Element	Q	Element	Q

SAMPLE LOG-IN SHEET

Lab Name					Page __ of __
Received By (Print Name)					Log-in Date
Received By (Signature)					
Case Number		Sample Delivery Group No.			Mod. Ref. No.

Remarks:		EPA Sample #	Aqueous Sample pH	Corresponding		Remarks: Condition of Sample Shipment, etc.
				Sample Tag #	Assigned Lab #	
1. Custody Seal(s)	Present/Absent* Intact/Broken					
2. Custody Seal Nos.	_____ _____					
3. Traffic Reports/Chain of Custody Records or Packing Lists	Present/Absent*					
4. Airbill	Airbill/Sticker Present/Absent*					
5. Airbill No.	_____ _____					
6. Sample Tags	Present/Absent*					
Sample Tag Numbers	Listed/Not Listed on Traffic Report/Chain of Custody Record					
7. Sample Condition	Intact/Broken*/ Leaking					
8. Cooler Temperature Indicator Bottle	Present/Absent*					
9. Cooler Temperature	_____					
10. Does information on Traffic Reports/Chain of Custody Records and sample tags agree?	Yes/No*					
11. Date Received at Lab	_____					
12. Time Received	_____					
Sample Transfer						
Fraction	Fraction					
Area #	Area #					
By	By					
On	On					

* Contact SMO and attach record of resolution

Reviewed By		Logbook No.
Date		Logbook Page No.

FULL INORGANICS COMPLETE SDG FILE (CSF) INVENTORY SHEET

LABORATORY NAME _____

CITY/STATE _____

CASE NO. _____ SDG NO. _____

SDG NOs. TO FOLLOW _____ _____ _____

MOD. REF. NO. _____

CONTRACT NO. _____

SOW NO. _____

All documents delivered in the Complete SDG File must be original documents where possible. (Reference - Exhibit B Section 2.6)

		PAGE NOs.		CHECK	
		FROM	TO	LAB	REGION
1.	Inventory Sheet (DC-2)				
2.	SDG Narrative				
3.	Sample Log-In Sheet (DC-1)				
4.	Traffic Report/Chain of Custody Record(s)				
5.	Cover Page				
Inorganic Analysis					
6.	Data Sheet (Form I-IN)				
7.	Initial & Continuing Calibration Verification (Form IIA-IN)				
8.	Blanks (Form III-IN)				
9.	ICP-AES Interference Check Sample (Form IVA-IN)				
10.	ICP-MS Interference Check Sample (Form IVB-IN)				
11.	Matrix Spike Sample Recovery (Form VA-IN)				
12.	Post-Digestion Spike Sample Recovery (Form VB-IN)				
13.	Duplicates (Form VI-IN)				
14.	Laboratory Control Sample (Form VII-IN)				
15.	ICP-AES and ICP-MS Serial Dilutions (Form VIII-IN)				
16.	Limit of Detection (Quarterly) (Form IX-IN)				
17.	ICP-AES Interelement Correction Factors (Annually) (Form XA-IN)				
18.	ICP-AES Interelement Correction Factors (Annually) (Form XB-IN)				
19.	Limit of Quantitation (Quarterly) (Form XI-IN)				
20.	Preparation Log (Form XII-IN)				
21.	Analysis Run Log (Form XIII-IN)				
22.	ICP-MS Tune (Form XIV-IN)				

FULL INORGANICS COMPLETE SDG FILE (CSF) INVENTORY SHEET

		PAGE NOs.		CHECK	
		FROM	TO	LAB	REGION
23.	ICP-MS Internal Standards Relative Intensity Summary (Form XV-IN)				
24.	ICP-AES Raw Data				
25.	ICP-MS Raw Data				
26.	Mercury Raw Data				
27.	Cyanide Raw Data				
28.	Preparation Logs Raw Data				
29.	Percent Solids Determination Log				
30.	USEPA Shipping/Receiving Documents				
	Airbill (No. of Shipments_____)				
	Sample Tags				
	Sample Log-In Sheet (Lab)				
31.	Misc. Shipping/Receiving Records (list all individual records) Communication Logs				
	_____				
	_____				
32.	Internal Lab Sample Transfer Records & Tracking Sheets (describe or list)				
	_____				
	_____				
33.	Internal Original Sample Prep & Analysis Records (describe or list)				
	Prep Records _____				
	Analysis Records _____				
	PE Instructions _____				
	Description _____				
34.	Other Records (describe or list)				
	Communication Logs				
	_____				
	_____				

35. Comments:

_____

_____

_____

Completed by:
(CLP Lab) _____ _____ _____
(Signature) (Print Name & Title) (Date)

Audited by:
(USEPA) _____ _____ _____
(Signature) (Print Name & Title) (Date)

EXHIBIT C

INORGANIC TARGET ANALYTE LIST
WITH CONTRACT REQUIRED
QUANTITATION LIMITS

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Exhibit C - Inorganic Target Analyte List With Contract Required Quantitation Limits

Table of Contents

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1.0 INORGANIC TARGET ANALYTE LIST AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQLS)

Analyte	CAS Number	ICP-AES CRQL for Water[1,2,3,4] (µg/L)	ICP-AES CRQL for Soil[1,2,3,4,5] (mg/kg)	ICP-MS CRQL for Water[1,2,4] (µg/L)	ICP-MS CRQL for Soil[1,2,4] (mg/kg)	ICP-AES for Wipes (µg)	ICP-AES for Filters (µg)
Aluminum	7429-90-5	500	50	50	--	50	5
Antimony	7440-36-0	60	6	5	2.5	6	0.6
Arsenic	7440-38-2	30	3	1	0.5	3	0.3
Barium	7440-39-3	50	5	5	2.5	5	0.5
Beryllium	7440-41-7	5	0.5	1	0.5	0.5	0.05
Cadmium	7440-43-9	5	1	1	0.5	0.5	0.05
Calcium	7440-70-2	2000	200	200	--	200	20
Chromium	7440-47-3	10	1	5	2.5	1	0.10
Cobalt	7440-48-4	20	2	1	0.5	2	0.2
Copper	7440-50-8	25	5	5	2.5	2.5	0.25
Iron	7439-89-6	200	50	200	--	20	2
Lead	7439-92-1	15	5	1	0.5	1.5	0.15
Magnesium	7439-95-4	1000	100	100	--	100	10
Manganese	7439-96-5	15	10	5	2.5	1.5	0.15
Mercury	7439-97-6	0.5	0.2	--	--	--	--
Nickel	7440-02-0	40	4	5	2.5	4	0.4
Potassium	7440-09-7	2000	200	200	--	200	20
Selenium	7782-49-2	35	3.5	5	2.5	3.5	0.35
Silver	7440-22-4	10	1	1	0.5	1	0.10
Sodium	7440-23-5	3000	300	300	--	300	30
Thallium	7440-28-0	50	5	1	0.5	5	0.5
Vanadium	7440-62-2	25	2.5	5	2.5	2.5	0.25
Zinc	7440-66-6	60	6	10	5	6	0.60
Cyanide[6]	57-12-5	20	1	--	--	--	--

[1] The CRQLs are the minimum levels of quantitation acceptable under the contract Statement of Work (SOW). The Limits of Quantitation (L_q) for a matrix and method must be less than the CRQL for the matrix and method.

[2] Subject to the restrictions specified in Exhibit D, any analytical method specified in ILM06.X Exhibit D may be utilized as long as the documented L_qs are less than the CRQLs.

[3] Mercury is analyzed by cold vapor atomic absorption. Cyanide is analyzed by colorimetry/spectrophotometry.

[4] Changes to the Inorganic Target Analyte List (TAL) (e.g., adding an additional analyte) or CRQLs may be requested under the modified analysis clause in the contract.

[5] The CRQLs for soil are based on 100% solids and on the exact weights and volumes specified in Exhibit D. Samples with less than 100% solids may have CRQLs greater than those listed in the table above.

[6] Use the CRQLs for cyanide regardless of the preparation or analysis method used to analyze the samples.