Prepared for
Nevada Environmental Response Trust
Henderson, Nevada

Prepared by
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QUALITY ASSURANCE PROJECT PLAN, REVISION 6

NEVADA ENVIRONMENTAL RESPONSE TRUST SITE HENDERSON, NEVADA

Quality Assurance Project Plan, Revision 6

Nevada Environmental Response Trust
(Former Tronox LLC Site)
Henderson, Nevada

Nevada Environmental Response Trust (Trust) Representative Certification

I certify that this document and all attachments submitted to the Division were prepared at the request of, or under the direction or supervision of the Trust. Based on my own involvement and/or my inquiry of the person or persons who manage the system(s) or those directly responsible for gathering the information or preparing the document, or the immediate supervisor of such person(s), the information submitted and provided herein is, to the best of my knowledge and belief, true, accurate, and complete in all material respects.

Office of the Nevada Environmental Response Trust

Le Petomane XXVII, Inc., not individually, but solely in its representative capacity as the Nevada Environmental Response Trust Trustee

Signature: Not Individually, but Solely as President of the Trustee

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Date: 2/24/21

Quality Assurance Project Plan, Revision 6

Nevada Environmental Response Trust
(Former Tronox LLC Site)
Henderson, Nevada

Responsible Certified Environmental Manager (CEM) for this project

I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been provided in a manner consistent with the current standards of the profession and, to the best of my knowledge, comply with all applicable federal, state and local statutes, regulations and ordinances.

2/24/2021

John M. Pekala, PG
Principal

Date

Certified Environmental Manager
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CONTENTS

LIST OF TABLES

APPENDICES

ACRONYMS AND ABBREVIATIONS

BMI	Black Mountain Industrial
CEM	Certified Environmental Manager
CFR	Code of Federal Regulations
CSM	Conceptual Site Model
°C	Degrees Celsius
DI	Deionized
DO	Dissolved Oxygen
DQI	Data Quality Indicator
DQO	Data Quality Objective
DVSR	Data Validation Summary Report
EMSL	EMSL Analytical, Inc.
EB	Equipment Blank
EDD	Electronic Data Deliverable
FB	Field Blank
FD	Field Duplicate
FSP	Field Sampling Plan
GES	Geotechnical & Environmental Services, Inc.
GWETS	Groundwater Extraction and Treatment System
HASP	Health and Safety Plan
HRA	Health Risk Assessment
ICP	Inductively Coupled Plasma
ID	Identification
IGS	Integrated Geosciences Laboratories, LLC
ISRACR	Interim Soil Removal Action Completion Report
LCS	laboratory control sample
LCSD	laboratory control sample duplicates
LDC	Laboratory Data Consultants, Inc.
MDC	Minimum Detectable Concentration
MDL	Method Detection Limit
Microbial Insights	Microbial Insights, Inc.
MPA	Master of Public Affairs
MPH	Master of Public Health

MS/MSD	Matrix Spike/Matrix Spike Duplicate
NDEP	Nevada Division of Environmental Protection
NELAC	National Environmental Laboratory Accreditation Conference
Neptune	Neptune and Company, Inc.
NERT	Nevada Environmental Response Trust
ORP	Oxygen Reduction Potential
OSHA	Occupational Safety and Health Administration
OVM	Organic Vapor Meter
Pace	Pace Analytical Energy Services, LLC
PDF	Portable Data Format
PE	Professional Engineer
PG	Professional Geologist
PID	photoionization detector
PM	Project Manager
PQL	Practical Quantitation Limit
QA	Quality Assurance
QAM	Quality Assurance Manual
QAPP	Quality Assurance Project Plan
QC	Quality Control
%R	Percent Recovery
Ramboll	Ramboll US Consulting, Inc.
RI/FS	Remedial Investigation and Feasibility Study Work Plan
RISB	Remedial Investigation Soil Boring
RISG	Remedial Investigation Soil Gas Samples
RIT	Trench Samples
RL	Reporting Limit
RPD	Relative Percent Difference
RPM	Remedial Project Manager
%RSD	Percent Relative Standard Deviation
SDG	Sample Delivery Group
Silver State	Silver State Analytical Laboratories, Inc.
SIM	Selected Ion Monitoring
Site	Nevada Environmental Response Trust (NERT) Site

SMP	Site Management Plan
SOP	Standard Operating Procedure
TB	Trip Blank
TIC	Tentatively Identified Compound
Trust	Nevada Environmental Response Trust
USEPA	U.S. Environmental Protection Agency
VFAs	Volatile fatty acids
VOC	Volatile Organic Compounds

DISTRIBUTION LIST

This QAPP will be distributed to the entities listed below. The QAPP may also be distributed to other project personnel including, but not limited to, client representatives and consultants, analytical laboratories, remediation contractors, and subcontractors, as needed.

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Project personnel from the organizations listed above are responsible for having the most recent version of this QAPP. The parties should contact Ramboll's Project Manager or Project Quality Assurance/Quality Control Officer for the most recent version. Individual pages include a revision number; any revised pages will be clearly marked with a new revision number and a list of revised pages will be distributed with any revisions.

1. PROJECT MANAGEMENT/DATA QUALITY OBJECTIVES

1.1 Introduction

On behalf of the Nevada Environmental Response Trust (the Trust) and under the direction of the Nevada Division of Environmental Protection (NDEP), Ramboll US Consulting, Inc. (Ramboll) prepared this Quality Assurance Project Plan (QAPP) to describe the quality assurance/quality control (QA/QC) procedures and performance criteria applicable to data collection tasks associated with the Remedial Investigation and Feasibility Study (RI/FS), including, but not limited to, field investigations, laboratory treatability studies, and field treatability/pilot studies for the Nevada Environmental Response Trust (NERT) Site located in Clark County, Nevada (the Site).

The purpose of this QAPP is to (1) describe the QA/QC procedures that the project team will follow during sampling and analysis; and (2) specify methods, performance criteria, and protocols to produce data that are representative of field conditions, meet the established data quality objectives (DQOs), and are of acceptable quality to meet industry standards. As stated above, the QAPP is intended to apply to tasks related to the RI/FS. This revised QAPP is not intended to be applicable to the remedial performance groundwater monitoring program, data collection activities associated with permit compliance, data collection associated with operation of the Groundwater Extraction and Treatment System (GWETS), or any other non-RI/FS data collection activity. Groundwater remedial performance monitoring is performed in accordance with the Remedial Performance Groundwater Sampling and Analysis Plan, Revision 1 (Ramboll 2020). This QAPP also does not address requirements for activities that are associated with the Site Management Plan (SMP), Revision 5 (Ramboll 2019a) or subsequent revisions of the SMP.

This revision to the QAPP replaces the prior version of the QAPP (Revision 5), which was submitted on July 16, 2020 (approved by NDEP on July 29, 2020). Furthermore, this revision addresses comments on the prior (December 10, 2020) submittal of the QAPP received from NDEP on January 20, 2021. A revision to the QAPP is necessary at this time for the following primary reasons:

1. The analytical laboratory Eurofins Air Toxics, LLC, located in Folsom, California has been added to support air methods addressed in this QAPP.

2. The analytical methods performed by Pace Analytical National Center for Testing and Innovation and Silver State Analytical Laboratories, Inc. have been expanded to include the full list of NDEP-certified analyses that the laboratories perform.

3. The analytical laboratory Eurofins Calscience Irvine is no longer the primary analytical provider for the NERT project, but still supports the NERT project in a limited capacity.

4. Appendices have been updated to include laboratory-specific documentation.

The QAPP will be implemented in conjunction with RI/FS project-specific workplans.

The project-specific documents contain a description of the investigation activities to be performed at the Site and specify the methods and procedures to be used to collect representative samples. Collectively, these documents will be referred to as the "RI/FS Work Plans" throughout this QAPP.

In addition, this QAPP will be implemented in conjunction with current treatability studies that are on-going at the Site and are related to RI/FS data collection tasks. The details regarding treatability studies are specified in project-specific treatability workplans.

Sampling details necessary to complete future RI/FS tasks that are not currently addressed in project-specific documents will be specified in task-specific work plans and the QAPP will be modified through the use of task-specific addenda.

Certain other documents are referenced herein as necessary to describe activities performed pursuant to the Interim Consent Agreement (Agreement) for the Site, effective February 14, 2011. These include the Interim Soil Removal Action Completion Report (ISRACR) (ENVIRON 2012), Annual Groundwater Monitoring Reports (Annual Reports; e.g. Ramboll 2019b), and the SMP, Revision 5 (Ramboll 2019a).

This QAPP has been prepared in general accordance with the applicable elements of several United States Environmental Protection Agency (USEPA) guidance documents, including *Guidance on Systematic Planning Using the Data Quality Objectives Process*, EPA QA/G-4 (USEPA 2006); *EPA Requirements for Quality Assurance Project Plans*, EPA QA/R-5 (USEPA 2001); *Guidance for Quality Assurance Project Plans*, EPA QA/G-5 (USEPA 2002) and *Region 9 Guidance for Quality Assurance Program Plans*, EPA R9QA/03.2 (USEPA 2012).

1.2 QAPP Organization

This plan is provided in both hard copy and electronic forms. Where electronic files are referenced or information is stated as provided electronically, this information is contained on the USB drive attached to the hard copy document.

The main body of the QAPP (Sections 1 – 4) provide overall DQOs, general procedures and protocols, and baseline performance criteria applicable to all RI/FS collection tasks. Section 5 describes task-specific modules that will be employed to prepare QAPP Addenda and identify variances for future scopes of work (e.g. additional investigations, treatability studies, pilot studies, etc.).

This QAPP is organized as follows:

- **Section 1** presents the purpose, objectives, and organization of the QAPP.
- **Section 2** provides guidance for measurement and data acquisition.
- **Section 3** describes the requirements for assessment and oversight.
- **Section 4** describes the requirements for data validation and data usability.
- **Section 5** describes the procedure for preparing QAPP Addenda.
- **Section 6** lists citations for key documents referenced in the QAPP.

1.3 QAPP Objectives and Use

The overall goal of the QAPP is to outline the procedures, methods, and other specifications a site investigation/monitoring project will use to ensure that the samples are collected and analyzed, the data are stored and managed, and the reporting of data are of high enough quality to meet project needs. Quality Assurance (QA) and Quality Control (QC) are activities undertaken to achieve this goal. QA is generally understood to be more comprehensive than QC. QA can be defined as the integrated system of activities that ensures that a project meets defined standards.

QC is the basic building block of data quality. It starts with establishing limits of acceptable performance and defining activities whose purpose is to control quality at the source by finding problems and defects. At its simplest, QC is inspecting, testing or checking data to make sure it is correct, valid, or otherwise in accordance with established specifications. The intent is to identify data that is not correct, and either correct or eliminate it, to make sure all data conforms to the specifications, and/or functions as required. QC does not ensure quality; it only finds instances where quality is absent or below established criteria.

QA asserts that data quality can be improved by looking 'further up the line'. It is aimed at preventing nonconforming or invalid data. QA can be defined as the integrated system of activities that ensures that a project meets defined standards. QA still has QC at its core to control data quality, but it goes beyond testing or inspection to also consider related activities or processes (such as training, document control and audits) that may be resulting in systemic and recurring data quality issues. The overall goal of the QA/QC procedures and specifications established in this QAPP is to ensure that comparable and representative data are produced during the implementation of the RI/FS data collection tasks and that data quality is consistently assessed and documented with respect to its precision, accuracy, sensitivity, and completeness. The specific QAPP objectives are to:

- Provide standardized methods and quality specifications for all anticipated field sampling, analysis, and data review procedures;
- Provide guidance and criteria for selected field and analytical procedures; and
- Establish procedures for reviewing and documenting compliance with field and analytical procedures.

This QAPP identifies the planning, implementation, and assessment procedures for the QA/QC program to be followed for current RI/FS data collection tasks; including the following:

- Collecting soil, soil gas, surface water and groundwater samples,
- Conducting field analysis of water quality parameters
- Labeling and shipping samples to laboratories
- Documenting field activities
- Coordinating laboratory services
- Reviewing and validating laboratory data
- Preparing data validation summary reports
- Submitting finalized, validated data

The QAPP will be expanded if further sampling work activities or analyses are identified. Similarly, should the list of chemicals of interest change, this QAPP will be modified to reflect those changes.

1.4 Project Organization/Roles and Responsibilities

Implementation of the approved QAPP requires the involvement of a wide range of individuals and organizations working together as a team. The project organization, and roles and responsibilities of the individuals involved, are defined in the QAPP to promote a clear understanding of the role that each party plays and to provide the lines of authority and reporting for the project. Personnel assigned to the project will be required to familiarize themselves with pertinent protocols and procedures presented in this QAPP. Key project positions relate to project oversight, project management, sampling and analytical data acquisition management, data validation management, and database management.

Ramboll and Tetra Tech, on behalf of the Trust, will be responsible for implementing RI/FS tasks. Ramboll is responsible for the direction of the Phase 1, 2, and 3 RI/FS Work Plan implementation as well as specific RI/FS treatability and pilot studies. Tetra Tech is responsible for implementing the Unit 4/5 Investigation as well as specific RI/FS treatability studies, pilot studies, and surface water sampling activities. The consultants are all responsible for performing the scope of work as directed by the Trust to the satisfaction of NDEP and USEPA. The project organization/roles and responsibilities are summarized in the sections below. Appendix A contains a table of the current individuals participating in the project and their specific roles and responsibilities. Members of the project team are subject to change. A change in team members alone will not necessitate a revision to the QAPP; however, Appendix A will be updated as necessary.

1.4.1 Nevada Environmental Response Trust

NERT Remediation Director

The Trust will provide overall project coordination and will be responsible for communications with NDEP and neighboring property owners. The NERT Remediation Director directs all RI/FS activities performed by the Trust, communicates with the consultants and the NDEP Remedial Project Manager.

1.4.2 Nevada Division of Environmental Protection

NDEP Remedial Project Manager

The NDEP Remedial Project Manager (NDEP RPM) has overall responsibility for regulatory oversight of all phases of the project and will be responsible for reviewing and approving the QAPP.

1.4.3 Consultant Roles

Project Manager

The Project Manager (PM) is responsible for technical and policy decisions involving the project, including interaction and coordination with project staff, and NDEP. The PM is also responsible for reviewing the sampling program(s) and associated field activities for compliance with the QAPP, including QA/QC, strategies, and review of all documents. The PM will have primary responsibility for project QA/QC and will evaluate and, if necessary, implement any corrective actions regarding data quality issues.

Project Quality Assurance/Quality Control Officer

The QA/QC Officer will enforce implementation of QA/QC procedures during the field sampling program and is responsible for reviewing the project QA/QC program as it relates to the collection and completeness of data from field and laboratory operations. During the contracting process the QA/QC Officer will ensure that method control limits are sufficient to meet this QAPP and are adequate for the use of the data. After receiving analytical results, the QA/QC Officer or designee will evaluate the field and laboratory data against the requirements of the QAPP.

Task Leaders

Task Leaders are responsible for scope, cost, and technical considerations of the project; staff and project coordination; and implementation and review of overall project quality of the collection, completeness, and presentation of the data. If field conditions require modifications to protocol outlined in the QAPP, or if questions arise, the Task Leaders will be the primary contact for direction of field personnel. The Task Leaders will also be responsible for overseeing review of the QA/QC programs related to the compilation of data.

Field Task Leader

The Field Task Leader is responsible for overall implementation of the approved work plan, including work conducted by the Site contractor and is responsible for general oversight of field activities.

Health Risk Assessment (HRA) Task Leader

The HRA Task Leader will work with the other Task Leaders and QA Officer to ensure that work is conducted in compliance with health risk assessment objectives and applicable QA procedures.

Analytical Task Leader

The Analytical Task Leader is responsible for coordination with the analytical laboratories, review of analytical data, and tracking data through the data validation and reporting processes and will work with the other Task Leaders to ensure that work is conducted in compliance with project-specific objectives and applicable QA/QC procedures.

Database Administrator

The Database Administrator is responsible for working with the Analytical Task Leader to assist with review of analytical data, and tracking data through the data validation and reporting processes. The Database Administrator is responsible for preparing the data for electronic submission to the database and submitting finalized, validated data to NERT databases.

1.4.4 Analytical Laboratories

The laboratories used for chemical and radiochemical soil and groundwater testing will be certified by the State of Nevada for the analysis of interest. In the absence of Nevada certification for a particular analysis, National Environmental Laboratory Accreditation Conference (NELAC) certification will be considered an acceptable substitute. Each laboratory will assign a PM as the primary point-of-contact for the project. The PM is responsible for ensuring project data meet the QA/QC objectives established herein. The Laboratory PM is also responsible for tracking the progress of testing in the laboratory and ensuring the timely delivery of data or other laboratory deliverables to the project team. Analytical laboratories may also subcontract analyses to other certified laboratories that can meet the requirements of this QAPP upon written approval of the PM or appropriate Analytical Task Leader.

- **Laboratory Project Manager at Eurofins Environment Testing America, Inc. (Eurofins TestAmerica)**

  Eurofins TestAmerica will be subcontracted for soil, surface water, and groundwater analysis (with the exception of asbestos and organic acid analysis). The analyses will primarily be analyzed at Eurofins TestAmerica’s Phoenix, Arizona location. Because of the variety of specialized analyses required for this project, several additional Nevada-certified Eurofins TestAmerica laboratories will be used during this project including the following laboratories: West Sacramento, California; Denver, Colorado; Buffalo, New York; St. Louis, Missouri; and Eurofins Calscience in Irvine, California. Eurofins TestAmerica will also subcontract with ALS Environmental (Kelso, Washington) for arsenic speciation analysis, and Eurofins Lancaster Laboratories Environmental, LLC (Lancaster, Pennsylvania) for total organic carbon in soil by Lloyd Kahn Method. The Laboratory PM will coordinate with individual laboratory managers for this project.

- **Laboratory Project Manager at Eurofins Air Toxics, LLC (Eurofins Air Toxics)**
  Eurofins Air Toxics will be subcontracted for soil vapor analyses. The samples will be analyzed at Eurofins Air Toxics' laboratory in Folsom, California.
- **Laboratory Project Manager at Pace Analytical National Center for Testing and Innovation (Pace National)**
  Pace National will be subcontracted to analyze soil, surface water, soil vapor, and groundwater samples. The analyses will primarily be analyzed at the Mt. Juliet, Tennessee location; however, analyses for hexavalent chromium will be performed at the Pace National Las Vegas laboratory, the analysis for volatile fatty acids (VFAs) and dissolved hydrogen will be performed at the Pace Gulf Coast Laboratory, and dioxins/furans will be analyzed by Pace Analytical located in Minneapolis, Minnesota.
- **Laboratory Project Manager at EMSL Analytical, Inc. (EMSL)**
  The primary subcontracted laboratory for asbestos analysis for this project is EMSL, which is a NELAC certified laboratory. Analysis for asbestos will take place at EMSL's laboratory in Cinnaminson, New Jersey.
- **Laboratory Project Manager at Silver State Analytical Laboratories, Inc. (Silver State)**
  Silver State will be subcontracted to analyze water samples for hexavalent chromium, perchlorate, metals, and wet chemistry methods including alkalinity, anions, organic carbon, ammonia, and sulfide. The samples will be analyzed at Silver State's laboratory in Las Vegas, Nevada.
- **Laboratory Project Manager at Geotechnical & Environmental Services, Inc. (GES)**
  GES will be subcontracted for geotechnical analyses. The analyses will be performed at the GES laboratory located in Las Vegas, Nevada.
- **Laboratory Project Manager at Integrated Geosciences Laboratories, LLC (IGS)**
  PTS Laboratories, Inc. was recently acquired by Integrated Geosciences Laboratories, LLC (IGS). IGS will be subcontracted for geotechnical analyses. The analyses will be performed at the IGS laboratory located in Houston, Texas.
- **Laboratory Project Manager at Microbial Insights, Inc. (Microbial Insights)**
  Microbial Insights will be subcontracted for the analysis of phospholipid fatty acid analysis and perchlorate reductase by quantitative polymerase chain reaction. The analyses will be performed by the Microbial Insights laboratory in Knoxville, Tennessee.

1.4.5 Data Validation Subcontractors

A Data Validation PM is responsible for validating the data, including review of data from the laboratory at the appropriate level, adding any qualifiers to call-out differences between guidelines and the reported data, and preparing the data for electronic submission to the database. Consultants or their designee perform data validation. The following data validation subcontractors may perform data validation for the projects included in this QAPP:

- **Laboratory Data Consultants, Inc. (LDC), Data Validation Project Manager**
  LDC of Carlsbad, California will be providing data validation for soil, groundwater and soil gas samples collected for chemical analyses.

- **Neptune and Company, Inc. (Neptune), Data Validation Project Manager**
  Neptune of Lakewood, Colorado will provide data validation for samples analyzed for asbestos.

1.5 Problem Definition and Background

The problem definition and Site background are presented in the RI/FS Work Plans (ENVIRON 2014a; Ramboll Environ 2016, 2017a, 2017b) and the Unit 4 and 5 Buildings Investigation Work Plan (Tetra Tech 2015). Problem definitions for treatability studies are presented in task-specific work plans (Ramboll Environ 2017c; Ramboll 2018a, 2018b, 2019c; Tetra Tech 2014, 2016a, 2016b, 2017a, 2017b, 2017c, 2017d, 2018, 2019). Additional details regarding Site history, historical and future land use, and potential contaminant releases at the Site are presented in the ISRACR (ENVIRON 2012) and the Annual Reports (Ramboll 2019b).

1.6 Project Description

The work to be completed as described in the RI/FS Work Plans include soil, surface water, groundwater, and soil gas sampling and chemical analyses to fill data gaps remaining from previous investigations, thereby providing additional information, including data regarding the magnitude and extent of selected chemicals in soil and groundwater at the Site. This information will be used to support the overall purpose of the RI/FS process, which is "to gather information sufficient to support an informed risk management decision regarding which remedy appears to be most appropriate for a given site" (USEPA 1988).

Treatability studies are conducted to support further development of preliminary remedial action alternatives for evaluation during the RI/FS process. Treatability studies can provide data important to an adequate evaluation of certain technologies for a given response action including information performance, operating parameters, and cost in sufficient detail to support the remedy selection process and subsequent design activities. Treatability and pilot studies can involve both field data collection tasks and bench-scale tests.

1.7 Data Quality Objectives

The overall goal of the QA/QC procedures and specifications established in this QAPP is to ensure that comparable and representative data are produced, and that data quality is consistently assessed and documented in order to accomplish the objectives of the RI/FS Work Plan. To achieve this goal, a systematic approach is followed in the planning of this project equivalent to the USEPA Data Quality Objective Process, as described in *Guidance on Systematic Planning Using the Data Quality Objectives Process*, EPA QA/G-4 (USEPA 2006).

The DQO Process is a series of logical steps that guides users to a plan for the resource-effective acquisition of environmental data. It is used to establish performance and acceptance criteria, which serve as the basis for designing a plan for generating data of sufficient quality and quantity to support the goals of the study. The DQO Process consists of seven iterative steps; the iterative nature of the DQO Process allows one or more of these steps to be revisited as more information on the problem is obtained. The seven steps are as follows:

1. State the Problem
2. Identify the Goal of the Study
3. Identify the Information Inputs
4. Define the Boundaries of the Study
5. Develop the Analytical Approach
6. Specify Performance of Acceptance Criteria
7. Develop the Detailed Plan for Obtaining Data

The approach to the DQO process is described in Section 2 of the Field Sampling Plan (FSP) (ENVIRON 2014b). Following the DQO Process has driven the development of the RI/FS Work Plan, the choice of analytical methods, the establishment of relevant data validation procedures, and related aspects of the collection of environmental measurement data. The DQOs specify the data type, quality, quantity, and uses needed to make decisions and are the basis for designing data collection activities. The QA/QC procedures for this project require that the data meet minimum requirements for precision, accuracy, completeness, representativeness, comparability, and sensitivity. The procedures and minimum requirements are presented in the subsequent sections of this QAPP.

The primary and all other subcontracted laboratories will perform analytical work in accordance with this QAPP, their internal Standard Operating Procedures (SOPs) and QA Manuals (QAMs), which comply with NELAC standards and USEPA protocols established in Test Methods for Evaluating Solid Waste, SW-846, Update III, dated June 1997, (SW-846) (USEPA 1997) and subsequent revisions. The primary laboratory is responsible for providing a copy of this QAPP to any subcontracted laboratories and ensuring that they follow the requirements of the QAPP. The QAMs include names of the responsible oversight individuals, QA/QC manual review and update procedures, organization and responsibilities of various individuals, QA/QC objectives and reports, QA/QC policies and procedures including sampling and receiving policies, equipment calibrations and maintenance information, necessary reagents and standards, extraction and analysis methods, data review and reporting processes, QA/QC procedures, system audits and corrective actions, certifications, recordkeeping and sample retention, sample disposal procedures, recent method detection limit (MDL) studies, and other QA/QC criteria relevant to the specific analytical methods.

The QA/QC Officer or designee will evaluate the field and laboratory data against the requirements of the QAPP. Each analytical laboratory will provide the most current QA/QC information, SOPs, and QAMs to the QA/QC Officer(s) that specify laboratory QA/QC samples and acceptance levels for each method. Laboratories contracted to perform analyses for this project are summarized on Table 1 and Table 2. The project specific MDLs, reporting limits (RLs), and QC limits for the analytes to be tested are provided in Tables 3 through 6.

Project laboratories will either use the limits specified in this QAPP or propose equally or more stringent statistically calculated QC limits. Specific QA/QC samples will be analyzed to satisfy the DQOs. The QA/QC samples to be used and the minimum frequency of their analysis for this project are summarized in Table 7. The data obtained will conform to the QC requirements specified in this QAPP. The project QA/QC Officer or designee will be responsible for performing the data quality evaluations, the results of which will be included in the QA/QC sections of reports. A discussion of the measurement parameters and how they will be used to evaluate project analytical data follows.

This QAPP, and any QAPP addendum, collectively, will specify explicitly the data that are needed to meet the objectives of the project and how that data will be used. In addition, this QAPP discusses implementation of control mechanisms and standards that are used to obtain data of sufficient quality to meet all project DQOs. The project DQOs provide an internal means for control and review so the environmentally related measurements and data collected by the project team are valid, scientifically sound, and of known, acceptable, and documented quality.

1.7.1 Characteristics of Data Quality

The term "data quality" refers to the level of uncertainty associated with a particular data set. Data quality associated with environmental measurement is a function of the sampling plan rationale and procedures used to collect the samples, as well as of the analytical methods and instrumentation used in making the measurements. Uncertainty cannot be eliminated entirely from environmental data. However, QA programs effective in measuring uncertainty in data are employed to monitor and control deviations from the desired DQOs. Sources of uncertainty that can be traced to the sampling component include poor sampling plan design, incorrect sample handling, faulty sample transportation, and inconsistent use of SOPs. The most common sources of uncertainty that can be traced to the analytical component of the total measurement system are problems associated with calibration and contamination.

The purpose of this QAPP is to ensure that the data collected are of known and documented quality and useful for the purposes for which they are intended. The procedures described are designed to obtain data quality indicators for each field procedure and analytical method. To ensure that quality data continues to be produced, systematic checks must show that test results and field procedures remain reproducible and that the analytical methodology is actually measuring the quantity of analytes in each sample.

All laboratory analytical data will be generated by a Nevada-certified (NELAC-certified for soil gas and asbestos) laboratory and validated by the data validation consultant. This applies to the primary laboratory and any laboratory subcontracted by the primary laboratory. The primary laboratory is responsible for ensuring any subcontracted laboratories are Nevada and/or certified for the applicable subcontracted methods. Laboratories must have an in-place program for data reduction, validation, and reporting as discussed in this QAPP. The reliability and credibility of analytical laboratory results can be corroborated by the inclusion of a program of scheduled replicate analyses, analyses of standard or spiked samples, and analysis of split samples with QA laboratories for some projects. Regularly scheduled analyses of known duplicates, standards, and spiked samples are a routine aspect of data reduction, validation, and reporting procedures.

1.7.2 Measurement Performance Criteria

Performance and acceptance criteria are often expressed in terms of data quality indicators (DQIs). The principal data quality indicators are sensitivity, accuracy, precision, completeness, representativeness, and comparability. These DQIs are discussed below.

Sensitivity refers to the amount of analyte necessary to produce a detector response that can be reliably detected (the "Method Detection Limit" or "MDL") or quantified (the

"Reporting Limit" or "RL," also known as the "Practical Quantitation Limit" or "PQL"). Where practicable, to reduce the possibility of false negatives, the PQL of each contaminant of concern should be lower than its corresponding screening value. In cases where a screening value is below the PQL, the sample-adjusted MDL can be used to evaluate the presence or absence of the analyte from environmental samples. Furthermore, to be considered valid for project use under normal conditions, the concentrations of contaminants of concern in any blank, e.g., equipment blank, field blank, and/or method blank, should not exceed the laboratory PQLs, unless a higher number is considered valid to reflect actual field and laboratory conditions. Ideally, and to reduce the possibility of false positives, all blanks associated with project samples should be free of detectable contamination. The project specific MDLs, PQLs, and screening values for the analytes to be tested are summarized in Tables 3 through 6.

In the case of radionuclides, the actual result of the analysis is reported regardless of the minimum detectable concentration (MDC) metric (NDEP 2018a). The MDC is a sample-specific value defined as the lowest level of activity in a sample that is statistically distinguishable from a sample with no activity. For radiochemical analysis the MDC is functionally equivalent to the MDL and no PQL is reported.

Asbestos data will be reported as a raw asbestos fiber counts per sample (NDEP 2008). While there are no PQLs with this method, sensitivity is calculated by the concentration of protocol structures per volume of PM10.

Accuracy of the data is the measure of the overall agreement of a measured value to the true value. It includes a combination of systematic error (bias) and random error (precision) components of sampling and analytical operations. It reflects the total error associated with a measurement. A measurement is considered accurate when the value reported does not differ from the true value or known concentration of a spike sample or standard beyond an acceptable margin. Field and laboratory activities are subject to accuracy checks.

To estimate the accuracy of the data, a selected sample is spiked with a known amount of a standard and is analyzed; the results of which are used to calculate percent recovery. Accuracy of laboratory analyses will be assessed by comparing results for a surrogate standard, matrix spike (MS) or laboratory control sample (LCS), and initial and continuing calibration of instruments to control limits. Laboratory accuracy is expressed as the percent recovery (%R). If the %R is determined to be outside of acceptance criteria, the data will be flagged for reporting purposes. Accuracy goals vary for analytical data by the type of analysis employed. Laboratory goals are established as part of the laboratory QA/QC program as described in the QA Manual and SOPs.

Accuracy of field measured data will be maintained by keeping the field instruments in proper working condition and calibrating as specified by operation manuals. The specific maintenance and calibration procedures in the operation manuals will be followed. The results of calibrations will be evaluated against the limits established in operation manuals specific to each instrument and recorded in field logbooks. Field accuracy will also be assessed in part through adherence to all sample handling, preservation, and holding time requirements as described in this QAPP.

Precision of the data is the measure of reproducibility or agreement among repeated measurements of the same sample under identical or substantially similar conditions. It is represented as either a range of values or as a standard deviation about the mean value. Precision goals vary for analytical data by the type of QC samples measured. Both laboratory and field QC samples are utilized to measure precision. Precision may be expressed as a percentage of the mean of measurements, such as relative range or relative standard deviation.

Analytical precision is a measurement of the variability associated with duplicate or replicate analyses of the same sample in the laboratory. Analytical precision is determined by analysis of laboratory QC samples, such as matrix spike duplicates (MSD) or laboratory control sample duplicates (LCSD), or sample duplicates. These samples should contain concentrations of an analyte above the RL. The most commonly used estimates of precision are percent relative standard deviation (%RSD) and the relative percent difference (RPD) when only two samples are used. RPDs for laboratory control samples are listed in Tables 3 through 6 under matrix spike RPD and blank spike/LCS RPD. %RSD values are calculated when there are more than two replicates, and the values are comparable to RPD values. The objectives for field sample RPDs are ≤30% for aqueous samples and ≤50% for solids and soil gas samples. Field sample RPDs are listed in Tables 3 through 6 under Duplicate RPDs. Samples outside the limits will be noted and reported with qualifiers.

Total precision is a measurement of the variability associated with the entire sampling and analytical process. It is determined by analysis of duplicate samples, which measure variability introduced by the laboratory and field operations. Field duplicate samples are analyzed to assess field and analytical precision.

Table 7 sets forth the frequency with which laboratory duplicate samples (i.e., LCSD and MSD) will be analyzed as well as the allowable difference in results for laboratory QA/QC samples. If the precision goals indicated in this QAPP are not met, the data will be qualified for reporting purposes.

Completeness is defined as the percentage of measurements judged to be valid based on the number of planned analyses. The completeness goal is to generate a sufficient amount of valid data to meet project needs and is calculated and reported for each method, matrix, and analyte combination. Completeness describes the content of the data set once errors, if any, have been identified and qualified and rejected data have been removed from the data set. Completeness may also be impacted when planned samples are not collected (e.g., caliche makes borehole advancement impossible) or collected samples are not analyzed (e.g., sample bottle broken in transit). The number of valid results divided by the number of planned results, expressed as a percentage, determines the completeness of the data set. The target completeness objective for this project is 90% for all types of samples; however, the actual completeness may be different, depending on the intrinsic nature of the samples. The data set will be considered complete if at least 90% of the data planned for collection is usable without meaningful qualifiers or errors. If the goal is not achieved, the rationale for the incompleteness will be assessed and reported. The data completeness will be evaluated during the data validation review process.

Representativeness is a qualitative term used to express the degree to which data accurately and precisely represent a characteristic of a population. It is mostly concerned with the proper design of the sampling program. Sample collection and handling methods, sample preparation, analytical procedures, holding times, and QA protocols developed for this project, and discussed in the subsequent sections of this document, have been established to ensure that the collected data are representative.

Comparability is a qualitative term used to express the confidence with which one data set can be compared to another data set. The objective for the QA/QC program is to produce data with the greatest possible degree of comparability. The number of matrices that are samples and the range of field conditions as encountered are considered in determining comparability. Data comparability will be sustained in this project through the use of defined procedures for sampling and analysis (sample collection and handling, sample preparation, and analytical procedures), reporting in standard units, normalizing results to standard conditions, and using standard and comprehensive reporting formats.

The data set will be considered comparable when USEPA or other standard methods have been used for analyses, the data set is representative, and the field investigation is conducted in accordance with accepted industry standards. Laboratory analyses for soil and groundwater will be performed in accordance with prescribed USEPA protocols established in the document *Test Methods for Evaluating Solid Waste, SW-846, Update III*, dated June 1997 (USEPA 1997) and subsequent updates, or other appropriate methods as required.

1.8 Specific Training Requirements/Certification

Personnel conducting field activities will be required to have completed Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response 40-hour training with current refresher training as detailed in Title 29 Code of Federal Regulations (CFR) Part 1910.120 for general site workers. Staff records documenting compliance with OSHA requirements are kept on file by the consultant.

The Health and Safety Plan (HASP) (ENVIRON 2014c) and task-specific HASPs have been developed for the RI/FS. These HASPs address accident prevention, personnel protection, and emergency response procedures. The HASPs establish in detail the protocols necessary for protecting workers from the hazards associated with the contaminants at the Site and physical hazards (such as slips, trips, and falls, electrical hazards, poisonous insects and plants, temperature hazards, etc.). All field staff working at the Site must comply with the appropriate HASP for each RI/FS activity. The PM will be responsible for ensuring necessary training and certification requirements are met for field operations.

The primary laboratory and all subcontracted laboratories will maintain current Nevada certification (NELAC-certification for soil gas, asbestos, and other analyses where NDEP certification is not available). The Laboratory PM will be responsible for ensuring certification is maintained for the analytical laboratory.

1.9 Documents and Records

This section includes information about the requirements for laboratory data packages. Requirements for field documentation are also outlined in Section 5 (field sheets, data sheets, photographs) and Section 6 (sample labels and sample custody) of the FSP (ENVIRON 2014b).

Records that may be generated during field work include field logs and data sheets, photographic logs, sample chain-of-custody records, sample labels, equipment inspection/calibration records, and others as necessary. Units of measure for any field measurements and/or analyses will be clearly identified on the field forms and in notes and logs as necessary. The QA/QC Officer, or other appropriate person designated by the PM, will review the field data to evaluate the completeness of the field records.

Analytical data will contain the necessary sample results and QC data to assure compliance with the DQOs defined for the project. Laboratory data will be provided in hard copy or Portable Data Format (PDF), and in Electronic Data Deliverable (EDD) format in accordance with this QAPP.

1.9.1 Field Notes

Field logbooks or a digital data collection device (such as a tablet) will provide the means of recording data collection activities at the time they take place. The logbooks/tablets will be assigned to field personnel, but they will be stored with the project files in a centralized document repository at an office location when not in use. Activities will be described in as much detail as possible such that the activity being described can be reconstructed without reliance on memory. Entries will be made in language that is objective, factual, and free of personal opinions or terminology that might later prove unclear or ambiguous.

The cover of each logbook will be identified by the project name, project-specific document number, and the time period which the logbook describes (beginning and end dates). The title page of each logbook will have contact information for the consultant Principal in Charge and PM. Entries into the logbook will contain a variety of project-specific information. At the beginning of each entry, the date, start time, weather, names of all team members present, level of personal protection being used, and the signature of the person making the entry will be entered. Names and affiliations of visitors to the site and the purpose of their visit will be recorded.

All logbook entries will be made in ink signed and dated and no erasures will be made. If an incorrect entry is made, the information will be crossed out with a single strike mark, initialed, and dated by the user. Whenever a sample is collected, or a measurement is made it shall be recorded. Any photographs taken will be identified by number and a description of the photograph will be provided. All equipment used to conduct measurements will be identified including serial number and any calibration conducted will be recorded. Entries made on electronic devices will contain the same information as recorded in hard copy logbooks.

1.9.2 Field Data Sheets

Field data sheets, either hard copy or electronic, will be completed by field personnel during sample collection activities. The types of field data sheets used include groundwater sampling logs, soil boring logs, well construction logs, well development logs, and soil gas sampling logs. If deemed necessary by the PM, electronic copies of the data sheets may be produced after sampling has been completed and these can be provided in the RI report or other reports as required, describing sampling conducted. Example field data sheets are provided in Appendix B of the FSP.

1.9.3 Photographs

Digital photographs will be taken if necessary, to supplement and verify information entered into field logbooks. For each photograph taken, the following will be recorded in the field logbook:

- Date, time, and location,
- Number and brief description of the photograph, and
- Direction in which the photograph was taken, if relevant.

If several photographs are taken during a task, general notes on the group of photographs taken may be sufficient, so long as the information outlined above can be obtained from the information provided for each photograph.

1.9.4 Sample Labels

Sample labels will be provided with sample containers for laboratory analysis. Each sample collected will be assigned a unique identification number. All samples will be labeled in a clear and precise way for proper identification in the field, laboratory, and progress reports. Section 2.3 provides additional detail on the sample labeling requirements for this project.

1.9.5 Chain-of-Custody Forms and Custody Seals

Completed original chain-of-custody forms will be sent with each sample shipment to document collection and shipment of samples for off-site laboratory analysis with copies to be maintained with the Site's project files. The chain-of-custody form will identify the contents of each shipment and maintain the custodial integrity of the samples. A custody seal signed by the sampler will be used to maintain custodial integrity of the samples during shipment to the laboratory. Section 2.3 provides additional detail on chain-of-custody and custody seal requirements for this project.

1.9.6 Verification of Electronic Data

Electronic data are generally derived from automated data acquisition systems in an analytical laboratory setting. Analytical instruments are equipped with software that performs various manipulations, identifications, and calculations of data. Software calculations are verified manually during the data validation process. Other data generated by the analytical laboratories may consist of manually recorded results. This data may be documented in a logbook and may subsequently be entered in the form of electronic files. As a part of their periodic reviews of logbooks and deliverables, the analytical laboratories will review transcriptions to ensure accuracy. Any errors encountered will trigger further auditing until no transcription errors are encountered in the audit set, up to and including 100 percent review.

Data can be reported in either hard copy form or electronic form. Screening level data are generally reported in summary form including sample identification (ID) information, results for the sample analyses, and a summary of the QC data including calibrations and verifications of precision, accuracy, and representativeness, where appropriate.

If data manipulation or reduction is performed electronically, outside of the raw data produced by purchased instrumentation, the formulae or macros employed for these purposes will be validated by comparing the results of a sample manual calculation to the result produced electronically. This validation will be documented and maintained in central files.

1.9.7 Electronic Data Deliverables (EDDs)

In addition to hard copy or PDF data reports provided by the contract laboratory, analytical data will be submitted to the consultant as EDDs. The names of analytical and preparation methods should be consistent with NDEP guidance (NDEP 2018b). It is the responsibility of the analytical laboratory to ensure that the hard copy data and electronic data are identical. The data reported in EDDs and in the hard copy reports must correspond exactly, including significant digits and units. It is preferable that the hard copy and EDD are generated at approximately the same time from the same data source.

The laboratory will provide an EDD for each Sample Delivery Group (SDG). The EDD should conform to the appropriate consultant's EDD format. Ramboll's Laboratory Electronic Data Deliverable Format Specification, EQuIS Edition is provided as Appendix D. At the discretion of the PM and the database administrator, an exception may be made to accept an alternative EDD format, which must contain the following information at a minimum:

- Sample ID
- Sample Date
- Sample Time
- Laboratory Sample ID
- Analytical Method
- Analyte Name
- CAS#
- Result
- Detect Flag (y/n)
- Laboratory Qualifier
- Units
- Reporting Limit or PQL
- MDL
- Sample Adjusted MDL
- Spike Levels
- Percent Recovery
- RPD
- Control limits for %R and RPD
- Extraction Method
- Cleanup Method
- Sample Receipt Date
- Extraction Date
- Analysis Date
- Analysis Time
- Dilution Factor
- Result Reportable (y/n)
- Batch Number
- SDG

The Data Validation Contractor or consultant designee will compare 10% of electronic entries with hardcopy results to check for consistency.

1.9.8 Laboratory Documentation

The following section discusses general laboratory requirements for preparing data packages. Data packages provided by contract analytical laboratories will be at USEPA Level II, Level III, or Level IV, depending on the level of data validation required.

The Level II data package includes the following information:

- Sample and client information
- Sampling time and date
- Sample number
- Analytical method
- Environmental sample results or measurements
- Reporting limits and method detection limits
- Chain of custody
- Sample receipt checklist
- Summary of QA/QC results
- Method blank results
- Surrogate recoveries, if applicable
- LCS/LCSD results, recoveries, RPDs and control limits
- MS/MSD results, recoveries, RPDs, and control limits
- Duplicate results RPD
- Spike amount
- Dilution factors
- Initial sample aliquots (weights or volumes) and final sample volumes
- Percent solids (soil samples)
- Sample preparation and analytical batch association
- Case narrative

The Level III data package includes the same information as the Level II data package with this additional information:

- Instrument summary forms for initial calibration, tunes (mass spectrometry methods only), calibration verification, internal standards, interference check standards (metals only), serial dilutions (metals only), and post digestion spikes (metals only).

The Level IV data package includes the same information as the Level III data package with this additional information:

- Raw data for all samples including chromatograms and instrument outputs for internal standards (when applicable), tunes, calibrations, QA/QC samples, etc.
- Sample preparation logs, sample run logs or injection logs

The case narrative will be written, and the release of data will be authorized by the laboratory director or his/her designee. Items to be included in the case narrative are the field sample ID with the corresponding laboratory ID, parameters analyzed for in each sample and the methodology used (USEPA method numbers or other citation), detailed description of all problems encountered and corrective actions taken, discussion of possible reasons for results exceeding the acceptable laboratory QA/QC results, and observations regarding any occurrences which may affect sample integrity or data quality.

Legible copies of the chain of custody forms for each sample will be maintained in the data package. Cooler log-in sheets will be associated with the corresponding chain of custody form/s. Any integral laboratory tracking document will also be included.

For each environmental sample analysis, this summary shall include field ID and corresponding laboratory ID, sample matrix, collection date/time, laboratory receipt date/time, date of sample extraction (if applicable), date and time of analysis, identification of the instrument used for analysis, instrument specifications, weight or volume of sample used for analysis/extraction, dilution or concentration factor used for the sample extract, method detection limit or sample quantitation limit, definitions of any data qualifiers used, and analytical results.

The following QA/QC results will be presented in summary form. Acceptance limits for all categories of QC criteria will be provided with the data. The summary of QA/QC results for analyses will include, but will not be limited to the following:

- Method Blank Analyses – The concentrations of any analytes found in blanks will be reported, even if the detected amounts are less than the PQL. The samples and QA/QC analyses associated with each method blank will be stated.
- Surrogate Standard Recovery (organic analyses only) – The name and concentration of each surrogate compound added will be detailed. The percent recovery of each surrogate compound in the samples, method blanks, MS/MSD, and other QA/QC analyses will be summarized with sample IDs such that the information can be linked to sample and QA/QC analyses.
- Matrix Spike/Matrix Spike Duplicate – For MS/MSD analyses the sample results, spiked sample results, percent recovery, and associated recovery and RPD control limits will be detailed. Parent sample results will also be included on the summary form.
- Laboratory Control Sample/ Laboratory Control Sample Duplicate – For LCS/LCSD analyses the spiked sample results, percent recovery, and associated recovery and RPD control limits will be detailed. LCS/LCSD analyses will also include: source of the sample(s), true value concentrations, found concentrations, percent recovery for each element analyzed, and the date and time of analysis.
- Laboratory Duplicates **–** For laboratory duplicate analyses the sample results, RPD between duplicate analyses, and control limits will be reported, as applicable. For laboratory QC check and/or LCS analyses, the %R and acceptable control limits for each analyte will be reported. All batch QC information will be linked to the corresponding sample groups.

All data packages will be reviewed by the individual laboratory QA Officer or designated data review specialists to ensure accurate documentation of any deviations from sample preparation, analysis, and/or QA/QC procedures and descriptions. Any problems identified by the laboratory QA Officer or designated data review specialists will be documented in the narrative of the report.

1.9.9 Laboratory Record Retention

Raw data will be available for further inspection, if required, and maintained in each laboratory's central job file. Records related to the analytical effort (i.e., cost information, scheduling, custody) are maintained at the laboratories in a secured location. Moreover, analytical laboratories will have the ability to archive data and quality records in a secured area protected from fire and environmental deterioration. Electronic data should be protected against exposure to magnetic or electronic sources.

All records necessary to reproduce the analytical calculations and support the reported results must be maintained for a minimum of five years. Types of records to be maintained for the project include, but are not limited to the following:

- Chain of custody forms, including: information regarding the sampler's name, date of sampling, type of sampling, sampling location and depth, number and type of sampling containers, signatures of sample custodians with transfer date and times noted, and sample receipt information including temperature and conditions upon arrival at the laboratory;
- Cooler receipt form documenting sample conditions upon arrival at the laboratory;
- Any discrepancy/deficiency report forms due to problems encountered during sampling, transportation, or analysis;
- Sample destruction authorization forms containing information on the manner of final disposal of samples upon completion of analysis;
- All laboratory notebooks including raw data readings, calibration details, QC checks, etc.;
- Hard copies of data system printouts (chromatograms, mass spectra, inductively coupled plasma [ICP] data files, etc.);
- Tabulation of analytical results with supporting QC information; and
- Sample preparation documents/records.

1.9.10 Field Document Retention

All field documentation generated during data collection for RI/FS tasks, including any electronic files produced, will be kept on file in a secured central repository in accordance with an established document retention policy.

2. DATA GENERATION AND ACQUISITION

This section discusses sampling process design; sampling methods; sample handling and custody; analytical methods; QC; instrument/equipment testing, inspection, maintenance, and calibration; inspection/acceptance of supplies; non-direct measurements, and data management.

2.1 Sampling Process Design

This QAPP is intended to cover soil, soil vapor, surface water, and groundwater sampling. In the event that a task requires additional media to be sampled, a task-specific QAPP addendum will be prepared. Samples will be collected according to applicable NDEP guidelines and following the procedures described in project-specific work plans. The collected data will be used to fill data gaps identified in previous investigations, thereby completing delineation of the lateral and vertical extent of selected chemicals in soil, soil gas, surface water and groundwater at the Site, as described in the RI/FS Work Plans.

2.2 Sampling Methods

Sampling will be conducted in accordance with the procedures described in the RI/FS Work Plans.

2.3 Sample Handling and Custody Requirements

In general, the samples and subcontracted analytical laboratories will handle samples in a manner to maximize data quality. Samples will be collected, handled, and stored in such a manner that they are representative of their original condition and chemical composition. Identification of samples and maintenance of custody are important elements that must also be utilized to ensure samples characterize Site conditions. All samples will be properly identified and maintained under chain-of-custody protocol to protect sample integrity. The following sections discuss the sample handling and custody requirements in detail.

2.3.1 Sample Identification

To maintain consistency, a sample identification convention has been developed and will be followed throughout data collection. The sample IDs will be entered onto the sample labels, field forms, chain-of-custody forms, logbooks, and other records documenting sampling activities.

Unless specified in an approved task-specific work plan, the identification system for primary field samples collected for RI activities will include the soil boring (RISB), trench (RIT), groundwater well (M for on-Site, PC for off-Site) or soil gas (RISG) well ID, trench sampling node if applicable (alpha numeric), a sample start depth if applicable (for discrete depth samples only), and the date in YYYYMMDD format. Grab groundwater samples collected from soil borings will be identified similarly to a soil sample but with "GW" in place of the depth. For example,

- A soil sample collected from a depth of 10 to 10.5 feet bgs at borehole RISB-1 on July 1, 2020 will be identified as RISB-1-10.0-20200701.
- A soil sample collected from a depth of 10 to 10.5 feet bgs at monitoring well borehole M-189 on July 1, 2020 will be identified as M-189-10.0-20200701.
- A grab groundwater sample collected from borehole RISB-1 on July 1, 2020 will be identified as RISB-1-GW-20200701.

- A trench soil sample collected from trench RIT-1, node A, at a depth of 2 to 2.5 feet bgs on July 1, 2020 will be identified as RIT-1-A-2.0-20200701.
- A soil gas sample collected from a depth of 5 feet bgs in soil gas sample point RISG-1 on July 1, 2020 will be identified as RISG-1-5.0-20200701.
- A groundwater sample collected from monitoring well M-161D on July 1, 2020 will be identified as M-161D-20200701.

Sample identifications for treatability and pilot studies may adopt a specific identification system appropriate for the work performed as specified in task-specific work plans.

2.3.2 Field QA/QC Sample IDs

Field QA/QC samples and procedures are discussed in Section 2.5.1. The field QC sample codes that may be applied to RI activities include:

- EB for Equipment Blanks
- FB for Field Blanks
- TB for Trip Blanks
- FD for Field Duplicates

Field QA/QC sample codes will be appended to the end of the primary sample ID that is represented by the field QA/QC sample.

An Equipment Blank (EB) should be named for the sample collected immediately prior to the collection of the EB.

The Field Blank (FB) and Trip Blank (TB) each represent a group of samples: a batch of twenty for the FB, and all samples within one sample cooler or other shipping container for the TB. Thus the FB and the TB should be named after the first sample of the batch (for FB) or the first sample placed in the cooler or shipping container (for TB).

The Field Duplicate (FD) represents the primary sample that is being duplicated, thus the FD should be named after the corresponding primary sample.

For example, the first soil sample to be placed in a cooler is RISB-1-10.0-20200701. The sample is to be analyzed for volatile organic compounds (VOCs), and a duplicate sample is collected. A TB is placed in the cooler with the sample, and an EB is collected immediately following the collection of the soil sample (after decontamination of sampling equipment). The associated field QA/QC samples will be identified as:

- RISB-1-10.0-20200701-EB (Equipment Blank)
- RISB-1-10.0-20200701-FB (Field Blank)
- RISB-1-10.0-20200701-TB (Trip Blank)
- RISB-1-10.0-20200701-FD (Field Duplicate)
- Field QA/QC samples and the frequencies of collection are summarized in Table 7.

Field QA/QC sample IDs for treatability and pilot studies may adopt a specific identification system appropriate for the work performed as specified in task-specific work plans.

2.3.3 Sample Labels

A sample label will be affixed to all sample containers sent to the analytical laboratory. Field personnel will complete an identification label for each sample with the following information written in waterproof, permanent ink:

- Client or Site name ("NERT") and project number
- Sample location and depth, if relevant
- Unique sample identifier
- Date and time sample collected
- Filtering performed, if any
- Preservative used, if any
- Name or initials of sampler
- Analyses or analysis code requested

The use of pre-printed sample labels is preferred in order to reduce sample misidentification problems due to transcription errors. Sample labels must be completed and affixed to the sample container in the field at the time of sample collection.

If errors are made on a sample label, corrections will be made by drawing a single line through the error and recording the correct information. All corrections will be dated and initialed.

2.3.4 Containers, Preservation, and Hold Time

The analytical methods, type of sample containers to be used for each sample type and analysis, preservation requirements for all samples, and holding times are provided in Table 8.

Each lot of preservative and sampling containers will be certified as contaminant-free by the provider and/or the laboratory. The laboratories will maintain certification documentation in their files. All preserved samples will be clearly identified on the sample label and chain-of-custody form. If samples requiring preservation are not preserved, field records will clearly specify the reason for the discrepancy.

Soil and groundwater sample containers will be placed in airtight plastic bags, if possible, and refrigerated or placed in a cooler with ice to chill and maintain a sample temperature of ≤ 6 degrees Celsius (°C). Aqueous samples should not be frozen.

Chemical activity continues in the sample until it is either analyzed or preserved. Once the sample has been preserved, the sample may be held for a period of time before analysis. The time from the collection of the sample to the analysis is defined as the holding time.

Certain soil samples will be submitted on hold ("contingent samples") with instructions for extraction at a later date, or pending analytical results of a corresponding sample submitted for initial analysis.

The laboratory will immediately notify the PM and QA/QC Officer if the analysis or reporting of results for initial soil samples may be delayed beyond the acceptable hold time of corresponding contingent sample(s). In such a scenario, the affected contingent sample(s) will be extracted in order to extend the acceptable hold time. Once the results of the initial soil samples are available, the PM and/or QA/QC Officer will decide whether the extractions of the corresponding contingent samples should be analyzed.

2.3.5 Sample Handling and Transport

Proper sample handling techniques are used to ensure the integrity and security of the samples. Samples for field measured parameters will be analyzed immediately in the field by the sampling crew and recorded in the field logbook and field data sheets. Field guidance documents within Appendix A of the FSP (ENVIRON 2014b) provide detailed information on groundwater and soil sampling and handling procedures. Samples for laboratory analysis will be transferred immediately to appropriate laboratory supplied containers in accordance with the following sample handling protocols:

Proper sample handling techniques are used to ensure the integrity and security of the samples. Samples for field measured parameters will be analyzed immediately in the field by the sampling crew and recorded in the field logbook and field data sheets. Samples for laboratory analysis will be transferred immediately to appropriate laboratory supplied containers in accordance with the following sample handling protocols:

- Don clean gloves before touching any sample containers, and take care to avoid direct contact with the sample.
- Samples will be quickly observed for color, appearance, and composition and recorded as necessary.
- The sample container will be labeled before or immediately after sampling in accordance with Section 2.3.2.
- Groundwater and soil sample containers and liners will be capped with Teflon™-lined caps, if applicable, before being placed in Ziploc™-type plastic bags. The samples will be placed in an ice chest and cooled to 4 °C or lower for transport to the laboratory.
- Summa canisters used for soil gas collection do not require cooling or additional bagging.
- All sample lids will stay with the original containers, and will not be mixed.
- Sample bottles or canisters will be wrapped in bubble wrap as necessary to minimize the potential for breakage or damage during shipment.
- The chain-of-custody form will be placed in a separate plastic bag and taped to the cooler lid or placed inside the cooler. A custody seal will be affixed to the cooler.

The samplers are responsible for proper handling practices until receipt at the laboratory, or by the courier, at which time the Laboratory Project Manager assumes responsibility of the samples through analysis and ultimately to the appropriate disposal of samples. Sample handling procedures specific to the laboratory are described in the individual laboratory QAMs.

2.3.6 Sample Custody

Standard sample custody procedures will be used to maintain and document sample integrity during collection, transportation, storage, and analysis. Custody documents must be written in waterproof, permanent ink. Documents will be corrected by drawing one line through the incorrect entry, entering the correct information, and initialing and dating the correction. The PM is responsible for proper custody practices so that possession and handling of individual samples can be traced from the time of collection until receipt at the laboratory, or by the courier. The Laboratory PM is responsible for establishing and implementing a control system for the samples in their possession that allows tracing from receipt of samples to disposal.

The chain-of-custody form provides an accurate written record that traces the possession of individual samples from the time of collection in the field until they are accepted at the analytical laboratory. The chain-of-custody form also documents the samples collected and the analyses requested. The sampler will record the following information on the chain-of-custody forms:

- Client and project number
- Name or initials and signature of sampler
- Name of destination analytical laboratory
- Name and phone number of Project Manager in case of questions
- Unique sample identifier for each sample
- Data and time of collection for each sample
- Number and type of containers included for each sample
- Analysis or analyses requested for each sample
- Preservatives used, if any, for each sample
- Sample matrix for each sample
- Any filtering performed, if applicable, for each sample
- Signatures of all persons having custody of the samples
- Dates and times of transfers of custody
- Shipping company identification number, if applicable
- Any other pertinent notes, comments, or remarks

Unused lines on the form will be crossed out and initialed.

A sample is considered to be under the control of, and in the custody of, the responsible person if the samples are in their physical possession, locked or sealed in a tamper-proof container, or stored in a secure area.

The person who collects the sample is the initial custodian of the sample. Any transfers are documented on the chain-of-custody by the individuals relinquishing and receiving the sample, along with their signature, and the date and time of transfer. This transfer must continue until the custody is released to a commercial carrier (i.e. FedEx), or the laboratory (either at the laboratory or to a laboratory employed courier). If relinquished to a commercial carrier, the carrier assumes custody through their shipping receipt. A copy of the shipping receipt should be attached to the chain-of-custody form as a permanent part of the custody control. If the sample is relinquished to a laboratory courier, the courier will then need to relinquish the sample to the stationary laboratory upon arrival. Once the sample has arrived at the stationary laboratory, it must be entered into the sample custody control system of the laboratory. If the sample is further transported to a subcontracted laboratory, the laboratory will produce an internal chain-of-custody form that will be available upon request. Chain-of-custody forms will be maintained in the consultant's project file and at the analytical laboratory.

To discourage tampering during transport, a custody seal will be placed on each cooler after the samples are packed. These consist of a security tape or label with the date and initial of the sampler or person currently in possession of the sample. Receiving personnel at the laboratory will note on the cooler receipt form whether or not the custody seals are intact.

2.3.7 Shipping Procedures

If shipping samples using a commercial courier is necessary, each shipping container (e.g. cooler) sent will have a separate chain-of-custody form. Samples collected during the investigation will be identified as environmental samples. Samples will be packed in the same manner as when being transported from the sampler to the laboratory, with the following changes:

- Dry ice is not allowed to be used to chill samples requiring commercial shipment.
- Extra packing material will be used to fill the coolers in order to limit movement within the container.
- Ice should be contained in zip-closure bags and the cooler should be lined with plastic as described below.
- Coolers containing ice and/or liquid samples should be lined with a plastic bag (such as a contractor garbage bag) to limit the potential for leaks in the event of ice bags leaking or sample container breakage. All necessary precautions must be taken to prevent any liquids leaking from sample coolers while in transit.
- Coolers will be closed and taped shut. If the cooler has a drain, it too will be closed and taped shut to prevent leaks.
- A minimum of two custody seals will be affixed to the front and side openings of the cooler so that the cooler cannot be opened without breaking a seal. The seals will be covered with wide clear tape so that the seals do not accidentally break in transit.
- Non-perishable samples collected on the weekend may be held for more than three days if there is no threat of exceeding hold times. If the samples require being chilled and maintained at a cool temperature, they will be stored under refrigeration and shipped the following workday.

2.3.7.1 Transport Container Receipt

Upon receipt of the transport container, the analytical laboratory will review the contents and sign and date the chain-of-custody forms. Additional information will also be added to the chain-of-custody form including: the status of the custody seals; the temperature of the cooler, how it was evaluated, and whether or not the samples were on ice; the conditions of samples and identification of any broken sample containers; description of any discrepancies on the chain-of-custody forms; sample labels and/or requested analyses; and the pH of preserved water samples, per lab SOP.

The analytical laboratory will contact the appropriate Analytical Task Leader or other designated person regarding any discrepancies in paperwork and/or chemical or thermal sample preservation. Nonconformance and corrective actions will be documented in accordance with the laboratory's QA/QC documents. After samples have been accepted, checked, and logged in, the laboratory will maintain them in a manner consistent with the custody and security requirements specified in the laboratory's QA/QC documents.

2.4 Analytical Methods

Both field measurement methods and stationary analytical laboratory methods will be utilized to analyze samples during implementation of this QAPP. Analytical methods including MDLs and PQLs to be used are listed on Tables 3 through 6. Laboratory SOPs for the listed methods have been developed and approved by the laboratories performing the analyses. The dates of the current SOPs are summarized for each laboratory on Table 2.

2.4.1 Field Measurement Methods

Samplers may conduct in-field measurement for depth to water; pH, conductivity, ferrous iron, sulfide, dissolved oxygen (DO), oxygen reduction potential (ORP), turbidity and temperature of groundwater samples; field screening of organic vapors in soil samples; and field screening for leak detection compounds in soil vapor samples. An appropriate pH meter and standardization buffers as recommended by the instrument manufacturer will be used. All meter standardizations, QC, and sample results will be recorded on the appropriate field forms.

2.4.2 Laboratory Analytical Methods

The project will involve, at a minimum, the analysis of soil, soil vapor, and groundwater samples. The primary methods that will be used to analyze samples are summarized in Table 2.

Each analytical laboratory used during implementation of this QAPP will be expected to provide a current Statement of Qualifications and laboratory QA/QC documents (including Quality Assurance Manual [QAM] and SOPs) for review by the QA/QC Manager or designee. In addition, analytical laboratories may be requested to provide current MDL studies, proposed RLs and other sources that contain QC procedures, QC acceptance criteria, and corresponding corrective actions for the analytical methods to be used during implementation of the QAPP.

The laboratory will use analytical methods and QA/QC procedures in conformance with approved methods for all samples. Copies of the laboratory QAMs and SOPs for all laboratories will be retained on file with Ramboll. Table 1 provides a list of the laboratory QAMs. Table 2 lists the specific analytical method to be used for each analyte and matrix and the applicable laboratory SOP date. In the event that the listed procedures cannot be performed, the laboratory will notify the appropriate (i.e. Ramboll or Tetra Tech) Analytical Task Leader of the conflict. The appropriate Task Leader or PM will notify the NDEP RPM for resolution. Unless specifically directed otherwise by the NDEP RPM, the standard or superseding test methods will govern. No changes in prescribed analytical methods will be made unless approved by the NDEP RPM.

PQLs compiled in Tables 3 through 6 are from a review of RLs generally achieved by the laboratories used for implementation of this QAPP. It should be noted that the limits listed in Tables 3 through 6 are laboratory dependent using clean matrices and may not always be achievable due to sample matrix effects, necessary dilution of the sample, and/or interferences.

2.5 Quality Control Requirements

There is potential variability in any sample collection, analysis, or measurement activity. QC activities are those technical activities routinely performed, not to eliminate or minimize errors, but to assess/demonstrate reliability and confidence in the measurement data generated. This section identifies QC checks for sample collection, field measurements, and laboratory analyses for RI/FS data collected.

2.5.1 Field QC Procedures

Field QA/QC samples that will be collected during the proposed investigation include field duplicate samples, field blanks, and equipment blanks. The description and purpose of these samples is discussed in this section. The frequency of analysis of field QA/QC samples is summarized in Table 7.

2.5.1.1 Field Duplicates

The FD is a replicate sample collected as close as possible to the same time that the primary sample is collected and from the same location, depth, or source, and is used to document representativeness and precision. FD samples will be labeled and packaged in the same manner as primary samples but with “FD” appended to the sample ID. FDs will be collected at a frequency of one in every 10 primary samples and will be analyzed for the same suite of parameters as the primary sample. The RPD between the field duplicate sample and the primary sample is evaluated to assess the homogeneity of the sample matrix and to assess the reproducibility of laboratory and field sample collection techniques.

2.5.1.2 Field Blanks

FB samples are used to assess the presence of contaminants arising from field sampling procedures. FB samples are obtained by filling a clean sampling container with analyte-free deionized (DI) water, in the field at a sample location. The sample then is analyzed in the same manner as the primary sample. FB samples will be collected at a frequency of one in every 20 samples and will be analyzed for the same suite of parameters as the primary sample to assess potential background contamination, contamination due to bottles and preservatives, or errors in the sampling process. FBs will not be collected for soil samples.

2.5.1.3 Equipment Blanks

EB samples are used to assess the effectiveness of decontamination procedures. EB samples are obtained by filling decontaminated sampling equipment with analyte-free DI water, sampling this water, and submitting the sample for analysis. Alternatively, DI water can be poured over or through the decontaminated sampling equipment and then collected and submitted for analysis. EBs will only be collected from samples that come in contact with non-dedicated sampling materials. EBs will be collected at a frequency of one in every 20 samples and will be analyzed for the same suite of parameters as the primary sample to assess the effectiveness of decontamination procedures.

2.5.1.4 Trip Blanks

TB samples are used to assess the potential for cross-contamination of VOCs between samples during storage and shipment. TB samples are only necessary when VOCs are being analyzed in soil, groundwater, and/or soil gas samples. A TB sample consists of one or more sample containers that are prepared at the analytical laboratory by filling with reagent-grade DI water (or, for soil gas sampling, VOC-free air). The TB sample is added to the sample cooler or other shipping container as soon as the first primary sample is collected. The TB sample accompanies the primary samples to the laboratory and is analyzed using the same analytical method as the primary samples. TB samples will be prepared and accompany any cooler or shipment that holds VOC samples.

2.5.2 Laboratory QC Procedures

The laboratory QA/QC program includes (i) performing analytical methods according to prescribed protocols and (ii) analyzing laboratory QA/QC samples to measure precision and accuracy of laboratory methods and equipment, instrument calibration and preventive maintenance. Laboratory QA/QC samples and parameters that will be analyzed include method blanks, laboratory control samples, matrix spikes, laboratory duplicates, and surrogates. The acceptable limits of the laboratory QA/QC samples are provided in Tables 3 through 6. The frequency of analysis of laboratory QA/QC samples is summarized in Table 7.

2.5.2.1 Method Blanks

A method blank is a sample of a matrix similar to the batch of associated samples. It is used to assess potential contamination in the laboratory process (e.g., contaminated reagents, improperly cleaned or calibrated equipment). For each analytical method, the laboratory will analyze one method blank sample per 20 primary field samples, or one per preparation batch, whichever is more frequent.

2.5.2.2 Laboratory Control Samples

A laboratory control sample is a known matrix (e.g., washed sea sand, reagent water, ultra-high purity nitrogen) that has been spiked with a known concentration of specific target analytes. It is used to demonstrate the accuracy of the analytical process. For each analytical method a laboratory control sample will be analyzed once per 20 primary field samples, or one per preparation batch, whichever is more frequent.

2.5.2.3 Matrix Spikes

Matrix spikes are performed by the analytical laboratory in order to evaluate the efficiency of the sample extraction and analysis procedures. Matrix spike samples are necessary because matrix interference (i.e., interference from the sample matrix -water or soil) may have a widely varying impact on the accuracy and precision of the extraction analysis. The matrix spike is prepared by the addition of known quantities of specific target compounds to a sample. The sample then is extracted and analyzed. The results of the analysis are compared with the known additions and a matrix spike recovery is calculated giving an evaluation of the accuracy of the extraction and analysis procedures. Typically, matrix spikes are performed in duplicate in order to evaluate the precision of the procedures as well as the accuracy. Matrix spike %Rs are reviewed to check that they are within acceptable range. For applicable analytical methods matrix spikes and matrix spike duplicates will be analyzed by the laboratory at a frequency of at least 1 per 20 primary field samples, or one per preparation batch, whichever is more frequent.

2.5.2.4 Laboratory Duplicates

Duplicate samples are used to assess precision in the analytical method. An additional aliquot is extracted from the primary sample and analyzed using the identical procedures as the primary sample. Then the results are compared to assess the precision. There are three types of duplicates: sample duplicates, laboratory control sample duplicates and matrix spike duplicates. For applicable analytical methods duplicates will be collected and analyzed at a frequency of at least 1 per 20 primary field samples, or one per preparation batch, whichever is more frequent.

2.5.2.5 Surrogates

A surrogate is a chemically similar compound spiked into each sample analyzed. Surrogates assess the accuracy of each individual analysis based on the surrogate recoveries. A surrogate (typically more than one) will be analyzed for each primary sample when applicable to the specified method. Surrogate recovery should fall within the limits set by the laboratory in accordance with procedures specified by the method.

2.5.3 Corrective Actions

Corrective actions may be initiated if precision or accuracy goals are not achieved. The initial step in corrective action will be to instruct the laboratory to examine its procedures to assess whether analytical or computational errors caused the anomalous results. At the same time, sample collection and handling procedures will be reviewed to assess whether they could have contributed to the anomalous results. Based on this evaluation, the appropriate PM or Analytical Task Leader, together with the appropriate Project QA Officer, will assess whether re-analysis or re-sampling is required or whether any protocol should be modified for future sampling events. Any changes in laboratory methods, or quality assurance parameters or limits, require written approval prior to implementation by the laboratory.

2.6 Instrument/Equipment Testing, Inspection, and Maintenance

2.6.1 Field Instrumentation

Equipment used in the collection of field measurements will be maintained according to the manufacturer’s specifications and will be inspected and calibrated prior to use. Field equipment requiring testing, inspection, and maintenance are:

- Organic Vapor Meter (OVM) utilized for measuring total organic vapors in soil and breathing zones;
- Particulate Meter utilized for measuring particulate matter in breathing zones and air column
- Water quality meter utilized to measure pH, temperature, and conductivity;
- A flow through cell to measure DO and ORP of certain water samples
- Turbidity meter utilized to measure turbidity of water samples;
- Electric water level meter utilized to measure depth to groundwater;
- Low flow adjustable sampling pump utilized for collection of groundwater, and
- Pressure transducers for water level/temperature monitoring and data logging.

The operating manuals for each piece of field equipment used describe the procedures required for testing, inspecting, and maintaining this equipment. The types and frequencies of testing, calibration, and maintenance for field instruments are presented in Table 9. The results of testing, inspections, or maintenance conducted will be summarized in the field logbook. Testing, inspection, and maintenance of field equipment and documentation of completion of these activities will be the responsibility of field personnel under the direction of the Field Task Leader.

2.6.2 Laboratory Equipment

Instrument maintenance logbooks are maintained in the laboratory. In general, the logbooks contain a schedule of maintenance, as well as a complete history of past maintenance, both routine and non-routine, for that particular instrument.

Preventive maintenance is performed according to the procedures specified in the manufacturer's instrument manuals, including lubrication, source cleaning, and detector cleaning, and the frequency of such maintenance. Chromatographic carrier gas purification traps, injector liners, and injector septa are cleaned or replaced on a regular basis. Precision and accuracy data are examined for trends and excursion beyond control limits to determine evidence of instrument malfunction. Maintenance will be performed when an instrument begins to degrade as evidenced by the degradation of peak resolution, shift in calibration curves, decrease in sensitivity, or failure to meet one or another of the pre-determined QC criteria.

2.7 Instrument Calibration and Frequency

2.7.1 Field Calibration Procedures

Instruments requiring calibration include air monitoring equipment (e.g., photoionization detectors (PIDs), gas multimeters, and dust monitoring meters) and water quality meters (e.g., pH, dissolved oxygen, specific conductivity, and turbidity meters). Equipment that can be field calibrated will be calibrated at least once per day prior to beginning sampling activities, with calibration results documented on an Instrument Calibration Log or in the field logbook. Equipment that must be calibrated in a laboratory setting should be used only if a current calibration certificate is available (for example, a calibration certificate is provided with a piece of rental monitoring equipment). Calibration procedures should be consistent with manufacturer instruction manuals for each instrument. Calibration and maintenance procedures for field equipment are detailed in Table 9.

2.7.2 Laboratory Calibration Procedures

The laboratory SOPs and QAMs address the calibration and frequency of calibration required for laboratory instruments as well as a description of documentation that will be completed. Laboratory QAMs are located in Appendix B. Laboratory SOPs are located in Appendix C. Table 10 summarizes the minimum frequency and scope of laboratory checks and calibrations to be performed during this project. Laboratories may have more stringent requirements as part of their SOPs, but must meet these minimum requirements as well as satisfying specific requirements of the standard methods specified for this project.

The Laboratory PM will be responsible for ensuring proper calibration and recordkeeping are conducted and will inform the appropriate Analytical Task Leader of any issues that may impact analytical results.

2.8 Inspection/Acceptance of Supplies and Consumables

Inspection will be conducted of field and laboratory supplies and consumables that may directly or indirectly affect the quality of results. Only supplies and consumables that have been determined to be acceptable will be utilized for the project.

Containers and individually certified Summa™ canisters will be provided by the laboratory or their approved supplier for samples to be analyzed by the laboratory. The analytical sample containers will be considered critical field supplies and consumables and the laboratory will provide an inventory describing the number and types of containers and/or canisters that have been provided. An inventory of containers received for each sampling event will be conducted by the field personnel and only new undamaged containers or canister will be utilized. If any container is found to have a defect or damage it will be properly discarded, and replacements will be requested as necessary. Canister gauges will be checked to ensure that vacuum conditions exist within the canister.

Other field supplies and consumables to be used include items such as bailer cord, calibration standards, disposable bladders for pumping, sample tubing, and distilled water. These supplies will be inspected upon receipt in part to verify they are new and in their original packaging. If any defects are noted or suspected they will be properly discarded and replaced prior to use. At the direction of NDEP, water samples collected for non-compliance perchlorate analysis by Method 314.0 do not require sterile filtration (NDEP 2016).

The supplies and consumables for this project will be handled and stored in such a manner such that they will not compromise sampling results. This will involve keeping items in their original containers before use, sealing containers properly between uses, or storing items in new or dedicated plastic bags.

The Field Task Leader with assistance from field personnel will be responsible for inspecting and accepting field supplies and consumables and providing replacements as necessary. Field personnel will inventory critical supplies on a regular basis and report to the Field Task Leader to ensure that work will not be delayed unnecessarily. The Field Task Leader will in turn provide updates on a regular basis to the PM.

2.8.1 Laboratory Supplies and Consumables

A detailed description of the laboratory inspection and acceptance policy for supplies and consumables is provided in the laboratory QA Manual. A list of primary supplies and consumables necessary for each laboratory analysis are provided in the individual SOPs.

Laboratory analytical group supervisors are responsible for ensuring that supplies and consumables are appropriate and adhere to laboratory policy as described in their QAM. Any issues regarding supplies that could have a negative effect on data quality will be communicated to the Laboratory PM who will inform the appropriate Analytical Task Leader in a timely manner.

2.9 Non-Direct Measurements

The historic data were generated as part of previous investigations performed at and around the Site. This data was evaluated during development of the RI/FS Work Plans, ISRACR, and Annual Groundwater Monitoring Reports.

The sampling and analysis as described in the RI/FS Work Plans and in this QAPP has been designed to generate data that will be comparable to the historic data and add to the Conceptual Site Model (CSM) developed for the Site.

Non-direct data such as historical reports, maps, literature searches, and previously collected analytical data will be reviewed prior to use to determine its acceptability based on the end use of the data.

2.10 Data Management

Data for this project will be generated in one of two ways; on-site from sampling and measurement activities and at the laboratory via analytical testing of soil, soil vapor, surface water, and groundwater samples. An overview of the management and reporting of this data is described in the following sections. Detailed requirements for the recording of field data and reporting of analytical data are included in Section 1.8 of this QAPP.

2.10.1 Field Data

Data that may be collected in the field primarily consist of; field-measured water quality parameters (pH, conductance, temperature), depth to groundwater measurements, sample depth measurements, and information and measurements of the location of borings.

Upon generation all field data will be immediately recorded in site-dedicated field logbooks. Calibration results will also be included in field logbooks and/or appropriate field forms. As necessary, field data from logbooks and field forms will be tabulated in spreadsheets to be included in reports. The QA/QC Officer, or other appropriate person designated by the Field Task Leader will review the field data to evaluate the completeness and accuracy of the field records.

2.10.2 Laboratory Data

A detailed description of laboratory data management procedures is provided in the laboratory QAMs. The Laboratory PM will be responsible for ensuring the established data management procedures are followed.

2.10.3 Data Management

The data will be entered into an EQuIS® database system maintained by Ramboll. The database will be maintained on a secure, enterprise-level database server that is backed-up regularly. Access to the database will be restricted to authorized users. Data management is further discussed in the NERT Data Management Plan completed March 2018 (Ramboll 2018c).

EDDs provided by the laboratories should be in the EQuIS 4-File EDD format as defined by the Ramboll Laboratory Electronic Data Deliverable Format Specification, EQuIS Edition. The EQuIS EDD format specifications are defined in Appendix D. The laboratories will check that their EDD submittals are consistent with lists of valid values provided in the Data Management Plan (Ramboll 2018c). Prior to loading into the database, EDDs will be reviewed for consistency with the file format and valid values. Data collected in the field will also be entered into the database and integrated with laboratory data.

The data validator will provide an EDD with data qualifiers, reason codes, and validation level columns appended to the data results. The validation data will be applied to the results records in the EQuIS® database.

Upon completion of data validation, an Access database consistent with NDEP specifications provided in Guidance on Unified Chemical Electronic Data Deliverable Format (NDEP 2018b) will be created. The Access databases will be created as often as required by individual work plans.

3. ASSESSMENT AND OVERSIGHT

Assessment and oversight are designed to determine whether the QAPP is being implemented as approved, to increase confidence in the information obtained, and ultimately, to determine whether the information may be used for its intended purpose(s).

3.1 Assessment and Response Actions

3.1.1 Field Assessments and Response Actions

Consultants are responsible for conducting field assessments for the task-specific work they are implementing. During the collection of RI/FS data, the Project QA/QC Officer, or other person designated by the PM, will perform periodic assessments of compliance with the QAPP. When problems or issues are identified, the field personnel will be notified of the issue and instructed as to how to proceed going forward. If a subsequent assessment reveals that the problem has not been corrected, a field audit will be conducted. In addition, periodic unannounced audits may be conducted of field operations. Such audits may include evaluation of the following actions: field procedures, sampling activities, field forms and logbooks, chain-of-custody procedures, field measurements, field equipment calibration procedures, and sample packaging and shipment. Additional routine audits may be conducted during the course of collecting RI/FS data as deemed necessary by the QA/QC Officer to verify conformance with corrective actions identified in a previous audit and/or to provide additional qualitative assessment of field procedures. The Field Task Leader, in consultation with the PM; will be responsible for ensuring corrective actions identified by the audit are completed.

3.1.2 Laboratory Assessments and Response Actions

The laboratory will be responsible for its own compliance with the QAPP. If an internal audit identifies a nonconformance that affects analytical results for this project then the Laboratory PM will notify the appropriate Analytical Task Leader in writing describing the nonconformance, the impact to analytical results, and corrective actions implemented to respond to the nonconformance.

During the data validation process, the consultant will review selected elements of the laboratory performance as it relates to the QAPP. If non-compliance issues are identified, the laboratory will be notified as to what issue(s) has been identified and will be required to prepare a written response to the consultant regarding what corrective action will be taken to address the issue. If non-compliance problems persist, audits and/or further performance evaluation may be implemented.

3.2 Descriptions of Audits

Internal audits will be performed to review and evaluate the adequacy of the QAPP and to ascertain that it is being implemented.

A systems audit will include an evaluation of field and laboratory QA/QC procedures. If the systems audit shows a significant discrepancy from the RI/FS Work Plan, project-specific work plans, or the QAPP, the responsible party will remedy the situation before work continues. Each major system change will require a written summary to document the change made.

A performance audit will include a careful evaluation of field, laboratory, and data documentation and management procedures to determine accuracy. Upon discovery of significant deviation from the QAPP, the nature and extent of the deviation will be recorded. Corrective action will be taken to remedy the deviation as necessary.

The Project QA/QC Officer has the responsibility of performing audits as deemed necessary and upon learning of any nonconformance. The PM may request an audit at any time. The PM and Task Leader(s) have ultimate responsibility for implementing corrective actions.

3.3 Reports to Management

Upon completion of any audit, the Project QA/QC Officer will document and report the QA/QC results and the identified issues (i.e., laboratory and/or field) to the Task Leader(s). The Task Leader(s) will evaluate the impact of the QA/QC issues and determine if the deviations will result in an adverse effect on the project conclusions. If it is determined that corrective actions are necessary, procedures outlined in Section 2.5.3 will be implemented.

4. DATA VALIDATION AND USABILITY

4.1 Data Review, Validation, and Verification Requirements

Data generated during performance of the RI/FS will undergo two levels of review. The laboratories and consultant will provide data verification. Data validation will be performed by consultant, and/or independent contractors, LDC and Neptune.

4.2 Validation and Verification Methods

4.2.1 Procedures Used for Verification of Field Data

Procedures to verify field data include checking for transcription errors and review of field logbooks at the time of data collection. Field sampling efforts as described in the field logbooks will be reviewed at the conclusion of each sampling event to confirm sampling procedures followed established procedures. If any significant nonconformance issues are noted they will be reported with a description of the potential effect of the nonconformance to the data. This task will be the responsibility of the Field Task Leader, or designee.

4.2.2 Procedures Used for Laboratory Data Verification

Initial data reduction, verification, and reporting will be performed by the laboratory as described in laboratory QAMs (Appendix B) and SOPs (Appendix C).

The laboratory will perform in-house analytical data verification under the direction of their own QA Officer and the Laboratory PM. The laboratory will be responsible for assessing data quality and advising of any data rated "preliminary", "unacceptable", or other notations that would caution the data user of possible nonconformance.

The Laboratory QA Officer will routinely audit or provide a secondary review of reports to assess data quality. This data assessment will be based on the assumption that the sample was properly collected and handled. Per NDEP guidance (NDEP 2007), cation-anion balance calculations must be performed on groundwater samples prior to submission to clients in order to ensure the anion-cation balance is within the limits of Standard Methods Section 1030E.

The Laboratory QA Officer will conduct a systematic review of the data for compliance with the established QC criteria based on spike, duplicate and blank results and an evaluation of data precision, accuracy, and completeness will be performed.

4.3 Procedures Used for Laboratory Data Validation

Data validation evaluates the analytical quality of a data set and occurs after data verification. The company that receives the laboratory deliverables is responsible for ensuring that the data are validated per NDEP requirements. The most current versions of USEPA's National Functional Guidelines (USEPA 2016, 2017a, 2017b) and NDEP's data validation guidance will be used to conduct data validation. NDEP's current data verification and validation requirements are addressed in the July 13, 2018 letter (NDEP 2018a). Asbestos-specific validation guidance is addressed in the July 24, 2012 document, *Guidance on Data Verification for Asbestos Data in Soil* (NDEP 2012). A summary of NDEP and Trust validation guidance follows and are included in Appendix E.

The Trust has adopted guidelines for validation based on NDEP guidance combined with the end-use of the data, as summarized below:

<u>10% Stage 4 (at least one sample) and 90% Stage 2B</u>

- All soil and soil vapor data included in a Data Validation Summary Report (DVSR)

Stage 2A

- All groundwater, surface water, and EB, FB, and TB data

Stage 1

- Waste characterization samples to support disposal decisions – Validation not required by receiving entity
- Soil and groundwater samples for bench-scale treatability studies – Intended use of data is to support field studies; non-routine analytical generally performed by non-certified research laboratory
- Groundwater Extraction and Treatment System (GWETS) performance monitoring samples – Intended use of data is to support day-to-day GWETS operations
- GWETS compliance samples – Intended use of data is to document permit compliance; validation not required by receiving entity
- Geotechnical and microbial samples – Analyses are generally for physical properties rather than contaminant concentrations
- Samples to support H&S decisions – Intended use of data is to support internal decision making; validation not required by receiving entity

Data validation will be consistent with NDEP Data Verification and Validation Requirements (NDEP 2018a) as well as USEPA Functional Guidelines (USEPA 2016, 2017a, 2017b). The guidance provides requirements for evaluating holding times, percent moisture, blank contamination, MS/MSD recoveries and RPD outliers, quantitation limits, and multiple results reported. An email from NDEP to the Trust dated December 7, 2018 (NDEP 2018c) clarified the guidance for reporting multiple results as follows: "Multiple results can be reported for a single analyte for several reasons: dilutions to report analytes within the linear range of the calibration, results reported with QC sample outliers can be reanalyzed beyond the holding time and both results are reported, and analytes can be reported from two different methods (e.g., SW-846 8260 and 8270). In cases where more than one result is reported for an analyte in a sample, and only one result is valid, the most technically sound value is to be reported and the other result is to be rejected or otherwise qualified as unused (e.g. "R" or "DNR"). The professional judgment used to choose the most technically sound result should be documented in the validation report and the DVSR."

QA/QC criteria checked during the validation process will include items identified in "Guidance for Labelling Externally Validated Laboratory Analytical Data for Superfund Use" (USEPA 2009). A sample list of validation checks at each stage are outlined below:

Stage 1 data validation checks include:

- Completeness Check
- Chain of Custody Review
- Evaluate sample results by comparing sample conditions upon receipt at the laboratory (e.g., preservation checks) and sample characteristics (e.g., percent moisture to the requirements and guidelines present in national or regional data validation documents, analytical methods(s) or contract.

Stage 2A data validation checks include:

- All parameters reviewed for Stage 1
- Review of Holding Times
- Review of QC Summaries, including negative controls (blanks), positive controls (LCS), and Sample Specific Controls (replicates, matrix spikes, surrogates, tracers/yields)
- Frequency of QC samples checked for appropriateness (e.g., one LCS per twenty samples in a preparation batch)

Stage 2B data validation checks include:

- All parameters reviewed for Stage 1 and Stage 2A
- Initial and Continuing Calibration
- Review of Internal Standards
- Interference Check Sample, ICP Serial Dilution, Gas Chromatography/Mass Spectrometry instrument performance check, and Reporting Limits
- Project or sampling specific items that have been identified for review
- Overall Assessment

Stage 4 data validation checks include:

- All parameters reviewed for Stage 1, Stage 2A, and Stage 2B
- Random recalculation (10-20%) of reported results versus raw data
- Review of Compound Identification, and Tentatively Identified Compounds (TICs) (where appropriate)
- Random check (10-20%) of integration and mass spectrum matches (where appropriate)

4.4 Reconciliation with Data Quality Objectives

Analytical results obtained from the project will be reconciled with the requirements specified in this QAPP. Data validation and usability include the final project checks to evaluate if the data obtained conforms to the project's objectives, and to estimate the effect of any deviations. Assessment of data for precision, accuracy, and completeness will be performed according to the following quantitative definitions.

4.4.1 Precision

If calculated from duplicate measurements:

$$RPD = \frac{(C_1 - C_2) * 100}{(C_1 + C_2)/2}$$

where:

RPD = relative percent difference
C_1 = larger of the two observed values
C_2 = smaller of the two observed values

If calculated from three or more replicates, use percent relative standard deviation (%RSD) rather than RPD:

$$\%RSD = \left(s / \bar{y}\right) 100$$

%RSD	=	percent relative standard deviation
s	=	standard deviation of replicates
$\bar{y}$	=	mean of replicate analyses

Standard deviation is defined as follows:

$$s = \sqrt{\sum_{i=1}^{n} \frac{\left(y_i / \bar{y}\right)^{-2}}{n-1}}$$

s	=	standard deviation
y_i	=	measured value of the i^{th} replicate
$\bar{y}$	=	mean of replicate analyses
n	=	number of replicates

4.4.2 Accuracy

For measurements where matrix spikes are used:

$$\%R = 100 \left[\frac{S - U}{C_{sa}} \right]$$

$\%R$	=	percent recovery
S	=	measured concentration in spiked aliquot
U	=	measured concentration in unspiked aliquot
C_{sa}	=	actual concentration of spike added

4.4.3 Completeness (Statistical)

Defined as follows for all measurements:

$$\%C = 100 \left[\frac{V}{T} \right]$$

$\%C$	=	percent completeness
V	=	number of measurements judged valid
T	=	total number of planned measurements

4.5 Data Submittals to NDEP

4.5.1 Data Validation Summary Report

After the data validation process is complete, a DVSR will be prepared. Validated data are to be provided in a summary report (hard copy and electronic format) along with a database (EDD) and laboratory reports for all samples validated. The DVSR will summarize the data reviewed, any nonconformances, and validation actions. Data qualifiers and reason codes will be added based on this evaluation. The data qualifiers will be based on USEPA guidance. A standard set of reason codes have been established and are listed on Table 11. The DVSR will include tables of all qualified data, the reason for qualification, any DQOs not met, the value of the exceedance, and the criteria exceeded will be provided, per NDEP specifications (NDEP 2018a). Stage 1 data are not typically included in a DVSR but can be included at the discretion of the Project Manager or where specified in a project-specific work plan.

4.5.2 Electronic Data Deliverable

Following data validation, the responsible party will create an Access database consistent with current NDEP guidance (NDEP 2018b). Stage 1 data can be included in the DVSR EDD as required by the project-specific work plan or at the discretion of the Project Manager.

4.6 Reconciliation With Data User Requirements

Each of the Trust's consultants will review the laboratory data for which they are responsible, as wells as the data's validation results to determine if the data meet the DQOs. Project results that do not meet DQOs will be reviewed by the appropriate consultant's Project QA Officer. Raw analytical data, laboratory notebooks, or other laboratory data may be obtained and examined as necessary. Corrective actions will begin with identifying the source of the problem. Potential problem sources may include failure to adhere to method procedures, improper data reduction, equipment malfunctions, or systemic contamination.

The first level of responsibility for identifying problems and initiating corrective action will be with the sampler or field personnel under the supervision of the appropriate Field Task Leader. The second level of responsibility will be with any person reviewing the data including the appropriate Project QA Officer and/or Analytical Task Leader.

If critical data are found to not meet QC objectives the appropriate Analytical Task Leader will take appropriate action to obtain acceptable data as determined necessary. This may include re-analyzing existing samples, collecting new investigative samples, or other actions that will result in obtaining acceptable data. The specific course of action will be determined on a case-by-case basis based in part on the effect the nonconformance may have on the RI/FS objectives.

Data that provide useful information but are not critical for achieving RI/FS objectives will be appropriately documented if they do not meet QC objectives. However, resampling or re-analysis to address such data will typically not be necessary.

Other corrective actions may include more intensive training, equipment repair followed by a more intensive preventive maintenance program, or removal of the source of systemic problems. Any and all corrective actions will be reviewed by the Task Leader(s) for certainty that resolution was achieved. Once resolved, the corrective action procedure will be fully documented.

5. QAPP ADDENDA

5.1 Procedures for Updating QAPP

Consultants are required to evaluate the existing QAPP requirements during the planning phase of a new project. Modifications to this QAPP to incorporate additional RI/FS data collection tasks will be addressed in QAPP Addenda. Appendix F presents the structure and the minimum task-specific elements that will be required to prepare a QAPP Addendum. The QAPP Addendum will be included as an appendix to any work plans for new RI/FS data collection tasks. The Addendum will be approved by NERT and NDEP at the time of work plan approval and will then become a part of this program QAPP. The following elements are required information for the preparation of the QAPP Addenda:

- Title, Version and Approval/Sign-off
- New Data Collection Task Information (includes DQOs, project organization, sampling design, sampling methods, analytical methods, field QC procedures)
- Laboratory Requirements (includes laboratory contact information, analytical methods, QC requirements, parameter lists, RLs, screening criteria, QAMs, and SOPs)
- Data Validation and Usability (identified stage of validation needed, validation subcontractor if necessary, validation criteria, guidance required, validation qualifiers, and reason codes)

5.2 Variance Submittal Procedure

Variances to the program QAPP must be documented in QAPP Addenda. For example if a new laboratory or analytical method is required to complete an on-going task, the associated information must be documented in a QAPP Addendum.

6. REFERENCES

ENVIRON International Corporation (ENVIRON). 2012. Interim Soil Removal Action Completion Report, Nevada Environmental Response Trust Site, Henderson, Nevada, August 2010 – November 2011. January. Revised September 2012. NDEP approved December 17, 2012.

ENVIRON. 2014a. Remedial Investigation and Feasibility Study Work Plan, Revision 2, Nevada Environmental Response Trust Site, Henderson, Nevada. June 19. NDEP Approved on July 2, 2014.

ENVIRON. 2014b. Field Sampling Plan, Revision 1, Nevada Environmental Response Trust Site, Henderson, Nevada. July.

ENVIRON. 2014c. Health and Safety Plan for Remedial Investigation and General Site Activities, Revision 1, Nevada Environmental Response Trust Site, Henderson, Nevada. July.

Nevada Division of Environmental Protection (NDEP). 2007. NDEP Additional Guidance on Completion of Quality Checks for Cation-Anion Balance for the BMI Plant Sites and Common Areas Projects, Henderson, Nevada. May.

NDEP. 2008. NDEP Detection Limits and Data Reporting for the BMI Plant Sites and Common Areas Projects, Henderson, Nevada. December.

NDEP. 2012. Guidance for Data Validation of Asbestos in Soils. July 24.

NDEP. 2016. Letter from Donald LaFara, Branch Supervisor, Laboratory Certification Program, Nevada Division of Environmental Protection, re: Sterile Filtration of Non-compliance Perchlorate Samples. June 27.

NDEP. 2018a. Notification: BMI Plant Sites and Common Area Projects, Henderson, NV: Data Validation Guidance. Letter from Carlton Parker to Mark Paris, Richard Pfarrer, Curt Richards, Jay Steinberg, Joe Kelly, Charles Elmendorf, Jeff Gibson. July 13.

NDEP. 2018b. Notification: BMI Plant Sites and Common Area Projects, Henderson, NV: Unified Chemical Electronic Data Deliverable (EDD Format). Letter from Carlton Parker to Mark Paris, Richard Pfarrer, Curt Richards, Jay Steinberg, Joe Kelly, Charles Elmendorf, Jeff Gibson. July 13.

NDEP. 2018c. Email from NDEP to the Trust regarding Multiple Results Reported. December 7.

Ramboll Environ US Corporation (Ramboll Environ). 2016. Technical Memorandum Remedial Investigation Data Evaluation, Nevada Environmental Response Trust Site, Henderson, Nevada. May 2.

Ramboll Environ. 2017a. RI/FS Work Plan Addendum: Phase 3 Remedial Investigation, Nevada Environmental Response Trust Site, Henderson, Nevada. May 5.

Ramboll Environ. 2017b. RI/FS Work Plan Addendum: Phase 3 Remedial Investigation, Revision 1, Nevada Environmental Response Trust Site, Henderson, Nevada. October 27.

Ramboll Environ. 2017c. Galleria Road Zero Valent Iron Treatability Study Work Plan, Nevada Environmental Response Trust Site, Henderson, Nevada. Ramboll Project No. 1690011200-046. September.

Ramboll. 2018a. In-Situ Bioelectrochemical Laboratory-Scale Treatability Study Work Plan, Nevada Environmental Response Trust Site, Henderson, Nevada. Ramboll Project No. 1690006943-007. May 7.

Ramboll. 2018b. Treatability/Pilot Study Modification No. 5. Nevada Environmental Response Trust Site, Henderson, Nevada. November 5.

Ramboll. 2018c. Data Management Plan. Nevada Environmental Response Trust Site, Henderson, Nevada. March 27.

Ramboll. 2019a. Site Management Plan, Revision 5. Nevada Environmental Response Trust Site, Henderson, Nevada. December 31.

Ramboll. 2019b. Annual Remedial Performance Report for Chromium and Perchlorate, Nevada Environmental Response Trust Site, Henderson, Nevada. December 31.

Ramboll. 2019c. Treatability/Pilot Study Modification No. 9. Nevada Environmental Response Trust Site, Henderson, Nevada. October 8.

Ramboll. 2020. Remedial Performance Groundwater Sampling and Analysis Plan, Revision 1. March 4.

Tetra Tech. 2014. Revised Soil Flushing Pilot Test Work Plan, Nevada Environmental Response Trust Site, Henderson, Nevada. November.

Tetra Tech. 2015. Unit 4 and 5 Buildings Investigation Work Plan, Nevada Environmental Response Trust Site, Henderson, Nevada. March.

Tetra Tech. 2016a. In-Situ Chromium Treatability Study Work Plan, Nevada Environmental Response Trust Site, Henderson, Nevada. May.

Tetra Tech. 2016b. Final Seep Well Field Area Bioremediation Treatability Study Work Plan, Nevada Environmental Response Trust Site, Henderson, Nevada. September.

Tetra Tech. 2017a. Vacuum Enhanced Recovery Treatability Study Work Plan, Nevada Environmental Response Trust Site, Henderson, Nevada. August.

Tetra Tech. 2017b. Las Vegas Wash Bioremediation Pilot Study Work Plan, Nevada Environmental Response Trust Site, Henderson, Nevada. September.

Tetra Tech. 2017c. Galleria Drive Bioremediation Treatability Study Work Plan, Nevada Environmental Response Trust Site, Henderson, Nevada. October.

Tetra Tech. 2017d. Unit 4 Source Area In-Situ Bioremediation Treatability Study Work Plan, Nevada Environmental Response Trust Site, Henderson, Nevada. December.

Tetra Tech. 2018. AP Area Down and Up Flushing Treatability Study Work Plan, Nevada Environmental Response Trust Site, Henderson, Nevada. February 12.

Tetra Tech. 2019. Hydrogen-Based Gas Permeable Membrane Technology Pilot Test Work Plan, Nevada Environmental Response Trust Site, Henderson, Nevada. February 15.

United States Environmental Protection Agency (USEPA). 1988. Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, Interim Final. October.

USEPA. 1997. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846). Office of Solid Waste, Washington, DC 20460. June.

USEPA. 2001. EPA Requirements for Quality Assurance Project Plans (EPA QA/R-5). Office of Environmental Information, Washington, DC 20460. EPA/240/B-01/003. March.

USEPA. 2002. EPA Guidance for Quality Assurance Project Plans. EPA/240/R-02/009 (EPA QA/G-5). Office of Environmental Information, U.S. Environmental Protection Agency. Washington, D.C. United States Environmental Protection Agency. December.

USEPA. 2006. Guidance on Systematic Planning Using the Data Quality Objectives Process. EPA/240/B-06/001 (EPA QA/G-4). Office of Environmental Information, U.S. Environmental Protection Agency. Washington, D.C.

USEPA. 2009. Guidance for Labelling Externally Validated Laboratory Analytical Data for Superfund Use. EPA 540-R-08-005. January 29.

USEPA. 2012. EPA Region 9 Guidance for Quality Assurance Program Plans. EPA/R9QA/03.2. March.

USEPA. 2016. National Functional Guidelines for Chlorinated Dibenzo-p-dioxins (CDD) and Chlorinated Dibenzofurans (CDF) Data Review. September.

USEPA. 2017a. National Functional Guidelines for Superfund Organic Methods Data Review. January.

USEPA. 2017b. National Functional Guidelines for Inorganic Superfund Data Review. January.

TABLES

TABLE 1. LABORATORY QUALITY ASSURANCE MANUALS
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTICAL LABORATORY	TITLE	VERSION	DATE	DOCUMENT FILE NAME
ALS Environmental (Kelso, WA)	Quality Assurance Manual	ALSKL-QAM Rev 26.1	July 1, 2018	ALS Kelso QA Manual Rev26.1_Jun2018.pdf
EMSL (Cinnaminson, NJ)	Module A Asbestos Analysis	EMSL QMS MANUAL (MOD A) Revision 21	January 4, 2019	EMSL QMS Manual Module A - Asbestos R21 2018.12.17.unc.pdf
EMSL (Cinnaminson, NJ)	Laboratory Quality Management System (QMS) Manual	EMSL QMS MANUAL Revison 21	January 4, 2019	EMSL QMS Manual R21 2018.12.17.unc.pdf
Eurofins Air Toxics (Folsom, CA)	Laboratory Quality Assurance Manual (LQAM)	Rev. 32	January 4, 2021	Eurofins Air Toxics LQAM 2021 rev. 32 + Appendices.pdf
Eurofins (Lancaster, PA)	Environmental Quality Policy Manual	QA-QM11872 Version 17	July 17, 2019	Eurofins Lancaster Environmental Quality Policy Manual Version 17.pdf
Eurofins TestAmerica (Buffalo, NY)	Quality Assurance Manual	BF-QAM Revision No.: 6	March 21, 2018	Eurofins TestAmerica Buffalo QA Manual R6_2018.pdf
Eurofins TestAmerica (Irvine, CA)	Quality Assurance Manual	IR-QAM Revision No.: 6	April 19, 2018	Eurofins TestAmerica Irvine QA Manual_2018.pdf
Eurofins TestAmerica (Denver, CO)	Quality Assurance Manual	TAL Denver QAM Revision No. 13	July 24, 2019	Eurofins TestAmerica QAM - Denver Lab.pdf
Eurofins TestAmerica (Phoenix, AZ)	Quality Assurance Manual	PX-QAD-011 Revision No. 7	December 4, 2019	Eurofins TestAmerica QAM - Phoenix Lab.pdf
Eurofins TestAmerica (West Sacramento, CA)	Quality Assurance Manual	WS-QAM Revision No. 5.9	June 14, 2019	Eurofins TestAmerica QAM - West Sacramento Lab.pdf
Eurofins TestAmerica (St. Louis, MO)	Quality Assurance Manual	ST-QAM Revision No. 11	May 31, 2018	Eurofins TestAmerica St Louis QA Manual Rev_11.pdf
GES (Las Vegas, NV)	Quality System Manual	Version 07	November 17, 2014	GES Nevada QSM_Version 07_November 17, 2014.pdf
IGS (Houston, TX)	Quality Assurance & Quality Control Plan	NA	September 1, 2019	IGS Labs QA_QC Manual.pdf
Microbial Insights (Knoxville, TN)	Quality Assurance Manual	Revision 16	January 11, 2021	Microbial Insights QA Manual 01_11_2021 Rev 16.pdf
Pace Gulf Coast (Baton Rouge, LA)	Quality Assurance Manual	Revision 38.1	January 8, 2019	Pace Gulf Coast GCAL QAM Rev 38.1.pdf
Pace (Las Vegas, NV)	Quality Manual	ENV-MAN-MTJL-0002 Revision 03	February 13, 2021	Pace Las Vegas ENV-MAN-MTJL-0002 Quality Manual LASV 1.pdf
Pace (Minneapolis, MN)	Quality Manual	ENV-MAN-NW-0001 Revision 02	January 7, 2020	Pace Minneapolis QAM_pdf.cfm.pdf
Pace National (Mt. Juliet, TN)	Quality Manual	ENV-MAN-MTJL-0001 Revision 03	February 25, 2020	Pace National ENV-MAN-MTJL-0001 QAManual.pdf
Silver State (Las Vegas, NV)	Quality Assurance Plan	QAP-2019	July 2019	Silver State QAP-2019-1.2 July 2019.pdf

NOTE:
NA = Not Available

TABLE 2. ANALYTICAL METHODS AND LABORATORIES
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	MATRIX	ANALYTICAL METHOD	CERTIFICATION	ANALYTICAL LABORATORY	SOP DATE[1]
Volatile Organic Compounds (VOCs) [2]	Water	EPA Method SW8260B	NV	Eurofins TestAmerica (Phoenix, AZ)	June 25, 2020
	Soil	EPA Method SW8260B	NV		
	Water	EPA Method SW8260B	NV	Pace National (Mt. Juliet, TN)	September 20, 2019
	Soil	EPA Method SW8260B	NV		
	Soil	EPA Method SW8260B	NV	Silver State (Las Vegas, NV)	March 24, 2020
	Water	EPA Method SW8260B	NV		
	Water	EPA Method SW8260B SIM	NELAC	Eurofins TestAmerica (Denver, CO)	October 1, 2019
	Soil	EPA Method SW8260B SIM	NELAC		
	Water	EPA Method SW8260B SIM	NELAC	Pace National (Mt. Juliet, TN)	September 20, 2019
	Soil Gas	EPA Method TO-15	NELAC	Pace National (Mt. Juliet, TN)	December 24, 2019
	Soil Gas	EPA Method TO-15	NELAC	Eurofins Air Toxics (Folsom, CA)[9]	November 4, 2020
	Soil Gas	EPA Method TO-15 SIM	NELAC	Eurofins Air Toxics (Folsom, CA)[9]	November 23, 2020
Semivolatile Organic Compounds (SVOCs)	Water	EPA Method SW8270C, SW8270D	NELAC, NV	Eurofins TestAmerica (Denver, CO)	March 3, 2020 (8270D) March 4, 2020 (8270C)
	Soil	EPA Method SW8270C, SW8270D	NELAC, NV		
	Water	EPA Method SW8270C, SW8270D	NELAC, NV	Eurofins TestAmerica (Phoenix, AZ)	December 11, 2020
	Soil	EPA Method SW8270C, SW8270D	NELAC, NV		
	Water	EPA Method SW8270C, SW8270D	NELAC, NV	Pace National (Mt. Juliet, TN)	September 19, 2019
	Soil	EPA Method SW8270C, SW8270D	NELAC, NV		
Phthalic Acid	Water	EPA Method SW8270C	NELAC	Eurofins TestAmerica (Denver, CO)	March 4, 2020
	Soil	EPA Method SW8270C	NELAC		
Polyaromatic Hydrocarbons (PAHs)	Water	EPA Method SW8270C SIM	NELAC	Eurofins TestAmerica (Phoenix, AZ)	April 20, 2019
	Soil	EPA Method SW8270C SIM	NELAC		
	Water	EPA Method SW8270C SIM	NELAC	Pace National (Mt. Juliet, TN)	September 19, 2020
	Soil	EPA Method SW8270C SIM	NELAC		
4-chlorobenzenesulfonic acid (p-CBSA)	Water	Lab SOP by Liquid Chromatography/ Electrospray/Mass Spectrometry SOP No. WS-LC-0013, Rev 3.1	Not Applicable	Eurofins TestAmerica (West Sacramento, CA)	October 5, 2012
Volatile Fatty Acids	Water	Lab SOP by Ion Chromatography SOP No. BF-MB-009, Rev 5	Not Applicable	Eurofins TestAmerica (Buffalo, NY)	March 21, 2018
Volatile Fatty Acids	Water	AM 23G	Not Applicable	Pace Gulf Coast (Baton Rouge, LA)	July 8, 2020

TABLE 2. ANALYTICAL METHODS AND LABORATORIES
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	MATRIX	ANALYTICAL METHOD	CERTIFICATION	ANALYTICAL LABORATORY	SOP DATE[1]
Organochlorine Pesticides	Water	EPA Method SW8081A, SW8081B	NV	Eurofins Calscience (Irvine, CA)	September 30, 2019
	Soil	EPA Method SW8081A, SW8081B	NV		
	Water	EPA Method SW8081A, SW8081B	NV	Eurofins TestAmerica (Phoenix, AZ)	June 11, 2020
	Soil	EPA Method SW8081A, SW8081B	NV		
Organophosphorus Pesticides	Water	EPA Method SW8141A	NV	Eurofins TestAmerica (Denver, CO)	January 30, 2020
	Soil	EPA Method SW8141A	NV		
PCBs as Aroclors	Water	EPA Method SW8082	NV	Eurofins TestAmerica (Phoenix, AZ)	May 29, 2020
	Soil	EPA Method SW8082	NV		
PCBs as Congeners	Water	EPA Method 1668A	NELAC	Eurofins TestAmerica (West Sacramento, CA)	September 2, 2016
	Soil	EPA Method 1668A	NELAC		
Dioxins/Furans	Water	EPA Method SW8290 or SW8280A[7]	NV (SW8290)/NELAC (SW8280A)	Eurofins TestAmerica (West Sacramento, CA)	November 7, 2019 (8290) June 9, 2016 (8280A)
	Soil	EPA Method SW8290 or SW8280A[7]	NV (SW8290)/NELAC (SW8280A)		
	Water	EPA Method SW8290	NV	Pace (Minneapolis, MN)	October 30, 2019
	Soil	EPA Method SW8290	NV		
Gasoline Range Organics (GROs)	Water	EPA Method SW8015B	NELAC	Eurofins TestAmerica (Phoenix, AZ)	October 4, 2019
	Soil	EPA Method SW8015B	NELAC		
Diesel/Oil Range Organics (DROs/OROs)	Water	EPA Method SW8015B	NELAC	Eurofins TestAmerica (Phoenix, AZ)	May 29, 2020
	Soil	EPA Method SW8015B	NELAC		
Methane	Water	Method RSK 175	NV	Eurofins TestAmerica (Denver, CO)	December 5, 2018
	Water	Method RSK 175	NV	Pace National (Mt. Juliet, TN)	July 31, 2019
Metals[3]	Water	EPA Method 200.7 / SW6010B, SW6010C	NV (200.7, SW6010C)/ NELAC (SW6010B)	Eurofins TestAmerica (Phoenix, AZ)	October 4, 2019
	Soil	EPA Method SW6010B, SW6010C			
	Water	EPA Method 200.7	NV	Eurofins TestAmerica (Denver, CO)	September 30, 2019
	Water	EPA Method SW6010B	NELAC	Eurofins TestAmerica (Denver, CO)	October 31, 2019
	Soil	EPA Method SW6010B	NELAC		
	Water	EPA Method 200.7 / SW6010B, SW6010C	NV (200.7, SW6010C)/ NELAC (SW6010B)	Pace National (Mt. Juliet, TN)	April 9, 2020
	Soil	EPA Method SW6010B, SW6010C			

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QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	MATRIX	ANALYTICAL METHOD	CERTIFICATION	ANALYTICAL LABORATORY	SOP DATE[1]
Metals[3]	Water	EPA Method 200.7 / SW6010B	NV	Silver State (Las Vegas, NV)	August 10, 2020
Metals[4]	Water	EPA Method 200.8 / SW6020	NV	Eurofins TestAmerica (Phoenix, AZ)	October 4, 2019
	Soil	EPA Method SW6020	NV		
	Water	EPA Method 200.8 / SW6020	NV	Pace National (Mt. Juliet, TN)	April 9, 2020
	Soil	EPA Method SW6020	NV		
	Water	EPA Method 200.8 / SW6020	NV	Silver State (Las Vegas, NV)	August 10, 2020
Rare Earth Metals[5]	Water	EPA Method SW6020A	NELAC	Eurofins TestAmerica (St. Louis, MO)	February 1, 2019
	Soil	EPA Method SW6020A	NELAC		
	Water	EPA Method SW6020	NELAC	Eurofins TestAmerica (Denver, CO)	November 30, 2018
Arsenic III/V	Water	EPA Method 1632A	NELAC	ALS (Kelso, Washington)	March 31, 2017
Mercury	Water	EPA Method SW7470A	NV	Eurofins TestAmerica (Phoenix, AZ)	April 14, 2019
	Soil	EPA Method SW7471A	NV		
	Water	EPA Method SW7470A	NV	Pace National (Mt. Juliet, TN)	April 8, 2020
	Soil	EPA Method SW7471A	NV		April 9, 2020
	Water	EPA Method SW7470A	NV	Silver State (Las Vegas, NV)	August 11, 2020
Hexavalent Chromium	Water	EPA Method 218.6	NV	Eurofins Calscience (Irvine, CA)	February 15, 2019
	Soil	EPA Method SW7199	NV		
	Water	EPA Method 218.6	Not Certified[8]	Eurofins TestAmerica (Phoenix, AZ)	January 27, 2021
	Soil	EPA Method SW7199	Not Certified[8]		
	Water	EPA Method SW7199	NV	Pace National (Las Vegas, NV)	June 20, 2019
	Soil	EPA Method SW7199	NV		
	Water	EPA Method 218.6	NV	Pace National (Mt. Juliet, TN)	June 20, 2019
	Water	EPA Method 218.7	NV	Silver State (Las Vegas, NV)	August 14, 2020
Alkalinity and Carbonate	Water	SM 2320B	NV	Eurofins TestAmerica (Phoenix, AZ)	August 30, 2019: SOPs PE-WET-017 and PE-WET-028
	Soil	SM 2320B	Not Applicable		
	Water	SM 2320B	NV	Pace National (Mt. Juliet, TN)	June 3, 2020

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QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	MATRIX	ANALYTICAL METHOD	CERTIFICATION	ANALYTICAL LABORATORY	SOP DATE[(1)]
Alkalinity and Carbonate	Water	SM 2320B	NV	Silver State (Las Vegas, NV)	April 17, 2020
Hardness	Water	SM 2340B	NV	Eurofins TestAmerica (Phoenix, AZ)	June 19, 2020
	Water	SM 2340B	NV	Silver State (Las Vegas, NV)	March 13, 2020
Ammonia	Water	SM 4500-NH_3 D	NV	Eurofins TestAmerica (Phoenix, AZ)	October 27, 2020
	Soil	SM 4500-NH_3 D	Not Applicable		
	Water	EPA Method 350.1 / SM4500-NH3 G	NV	Pace National (Mt. Juliet, TN)	April 7, 2020
	Water	SM 4500-NH3 D	NV	Silver State (Las Vegas, NV)	August 13, 2020
Total Kjeldahl Nitrogen (TKN)	Water	EPA Method 351.2	NV	Eurofins TestAmerica (Denver, CO)	June 30, 2019
	Water	EPA Method 351.2	NV	Eurofins TestAmerica (Phoenix, AZ)	June 24, 2020
	Water	EPA Method 351.2	NV	Pace National (Mt. Juliet, TN)	April 3, 2020
	Water	SM 4500-Norg B	NV	Silver State (Las Vegas, NV)	May 18, 2020
Inorganic Anions[(6)]	Water	EPA Method 300.0	NV	Eurofins TestAmerica (Phoenix, AZ)	March 31, 2020
	Soil	EPA Method SW9056A, 300.0	NV		
	Water	EPA Method 300.0	NV	Pace National (Mt. Juliet, TN)	May 19, 2020
	Soil	EPA Method SW9056A, 300.0	NV		
	Water	EPA Method 300.0	NV	Silver State (Las Vegas, NV)	August 10, 2020
Chlorate, Chlorite	Water	EPA Method 300.1	NV	Eurofins Calscience (Irvine, CA)	February 12, 2019
	Soil	EPA Method 300.1	Not Applicable		
	Water	EPA Method 300.1B	NV	Eurofins TestAmerica (Phoenix, AZ)	August 27, 2020
	Soil	EPA Method 300.1B	Not Applicable		
	Water	EPA Method 300.0 (Chlorate)	NV	Pace National (Mt. Juliet, TN)	May 19, 2020
	Water	EPA Method 300.1	Not Certified[(8)]	Pace National (Mt. Juliet, TN)	December 11, 2020
	Water	EPA Method 300.1	NV	Silver State (Las Vegas, NV)	August 10, 2020
Cyanide	Water	EPA Method SW9014	NV	Eurofins TestAmerica (Phoenix, AZ)	March 25, 2019
	Soil	EPA Method SW9014	NV		

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QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	MATRIX	ANALYTICAL METHOD	CERTIFICATION	ANALYTICAL LABORATORY	SOP DATE[(1)]
Formaldehyde	Water	EPA Method SW8315A	NV	Eurofins Calscience (Irvine, CA)	March 1, 2017
	Soil	EPA Method SW8315A	NV		
Phosphorus	Water	EPA Method 365.3	NV	Eurofins Calscience (Irvine, CA)	February 22, 2019
	Water	SM4500-P B+E	NV	Eurofins TestAmerica (Phoenix, AZ)	October 23, 2018
	Water	EPA Method 365.1	NV	Eurofins TestAmerica (Denver, CO)	April 5, 2019
	Water	EPA Method 365.1	NV	Pace National (Mt. Juliet, TN)	June 26, 2020
	Water	EPA Method 365.4	NV		April 26, 2020
	Water	SM4500-P E	NV	Silver State (Las Vegas, NV)	August 17, 2020
Sulfide	Water	SM 4500-S^{2-} D	NV	Eurofins TestAmerica (Denver, CO)	August 3, 2020
	Water	SM 4500-S^{2-} F	NV	Silver State (Las Vegas, NV)	August 17, 2020
Perchlorate	Water	EPA Method 314.0	NV	Eurofins TestAmerica (Phoenix, AZ)	February 28, 2019
	Soil	EPA Method 314.0	NV		
	Water	EPA Method 314.0	NV	Pace National (Mt. Juliet, TN)	May 17, 2020
	Water	EPA Method 314.0	NV	Silver State (Las Vegas, NV)	August 10, 2020
Perchlorate	Water	EPA Method SW6860	NV	Eurofins TestAmerica (Denver, CO)	December 31, 2019
	Soil	EPA Method SW6860	NV		
pH	Soil	EPA Method SW9045D	NV	Eurofins TestAmerica (Phoenix, AZ)	October 7, 2019
	Soil	EPA Method SW9045D	NV	Pace National (Mt. Juliet, TN)	May 17, 2020
	Soil	EPA Method SW9045D	NV	Silver State (Las Vegas, NV)	August 6, 2020
Specific Conductance	Water	SM 2510B	NV	Eurofins TestAmerica (Phoenix, AZ)	June 24, 2020
	Soil	SM 2510B	Not Applicable		
	Water	SM 2510B	NV	Eurofins TestAmerica (Denver, CO)	April 2, 2020
	Soil	SM 2510B	Not Applicable		
	Water	SM 2510B	NV	Silver State (Las Vegas, NV)	August 12, 2020
	Soil	SM 2510B	Not Applicable		

TABLE 2. ANALYTICAL METHODS AND LABORATORIES
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	MATRIX	ANALYTICAL METHOD	CERTIFICATION	ANALYTICAL LABORATORY	SOP DATE(1)
Total Dissolved Solids (TDS)	Water	SM 2540C	NV	Eurofins TestAmerica (Phoenix, AZ)	March 31, 2020
	Water	SM 2540C	NV	Pace National (Mt. Juliet, TN)	April 2, 2020
	Water	SM 2540C	NV	Silver State (Las Vegas, NV)	August 17, 2020
Total and/or Dissolved Organic Carbon	Water	SM 5310B	NV	Eurofins TestAmerica (Denver, CO)	April 5, 2019
	Water	SM 5310B	NV	Eurofins TestAmerica (Phoenix, AZ)	December 1, 2019
	Soil	Lloyd Kahn	NELAC	Eurofins (Lancaster, PA)	July 9, 2019
	Water	SM 5310B	NV	Pace National (Mt. Juliet, TN)	June 4, 2020
Surfactants	Soil	SM 5540C	NELAC	Eurofins Calscience (Irvine, CA)	February 5, 2018
	Water	SM 5540C	NV	Silver State (Las Vegas, NV)	August 12, 2020
Radium 226	Water	EPA Method 903.0	NV	Eurofins TestAmerica (St. Louis, MO)	January 16, 2019
	Soil	EPA Method 903.0	NELAC		
Radium 228	Water	EPA Method 904.0	NV	Eurofins TestAmerica (St. Louis, MO)	January 16, 2019
	Soil	EPA Method 904.0	NELAC		
Thorium 228, 230, 232 and Uranium 234, 235, and 238	Water	DOE EML HASL 300 A-01-R (alpha spectroscopy)	NELAC	Eurofins TestAmerica (St. Louis, MO)	March 9, 2018
	Soil	DOE EML HASL 300 A-01-R (alpha spectroscopy)	NELAC		
Asbestos	Soil	EPA Method 540-R-97-028 modified per Berman & Kolk (2000)	NV	EMSL Analytical (Cinnaminson, NJ)	June 18, 2010
Helium	Soil Gas	ASTM D1946	Not Applicable	Eurofins Air Toxics (Folsom, CA)(9)	July 13, 2020
	Soil Gas	ASTM D1946	Not Applicable	Pace National (Mt. Juliet, TN)	July 3, 2020
Dissolved Hydrogen	Water	AM20GAx	Not Applicable	Pace Gulf Coast (Baton Rouge, LA)	January 29, 2021
Microbial Identification	Soil, Water	CENSUS DNA-quantitative polymerase chain reaction (qPCR)	Not Applicable	Microbial Insights (Knoxville, TN)(9)	March 8, 2017
Phospholipid Fatty Acid Analysis (PLFA)	Soil, Water	MI SOP-PLFA GC, Rev. 1.4	Not Applicable	Microbial Insights (Knoxville, TN)(9)	February 12, 2013

TABLE 2. ANALYTICAL METHODS AND LABORATORIES
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	MATRIX	ANALYTICAL METHOD	CERTIFICATION	ANALYTICAL LABORATORY	SOP DATE[(1)]
Attenberg Limits	Soil	ASTM D4318	Not Applicable	IGS (Houston, TX)	September 1, 2019
Dry Bulk Density	Soil	ASTM D2937-10	Not Applicable	IGS (Houston, TX)	September 1, 2019
Engineering USCS Classification	Soil	ASTM D2487	Not Applicable	IGS (Houston, TX)	September 1, 2019
Grain Size	Soil	ASTM D422-63	Not Applicable	IGS (Houston, TX)	September 1, 2019
Hydraulic Conductivity	Soil	API RP40/EPA 9100	Not Applicable	IGS (Houston, TX)	September 1, 2019
Moisture Content	Soil	ASTM D2216	Not Applicable	IGS (Houston, TX)	September 1, 2019
Laser Particle Size	Soil	ASTM D4464-00	Not Applicable	IGS (Houston, TX)	September 1, 2019
Porosity	Soil	ASTM D425	Not Applicable	IGS (Houston, TX)	September 1, 2019
Total Organic Carbon	Soil	Walkley-Black	Not Applicable	IGS (Houston, TX)	September 1, 2019
Sieve Analysis of Fine and Coarse Aggregates	Soil	ASTM C136	Not Applicable	GES (Las Vegas, NV)	2014[(10)]
Amount of Material Finer than 75-µm (No. 200) Sieve in Soils by Washing	Soil	ASTM D1140	Not Applicable	GES (Las Vegas, NV)	2017[(10)]
Density of Soil in Place by the Drive-Cylinder Method	Soil	ASTM D2937	Not Applicable	GES (Las Vegas, NV)	2017[(10)]
Relative Density (Specific Gravity) and Absorption of Fine Aggregate1	Soil	ASTM C128	Not Applicable	GES (Las Vegas, NV)	2015[(10)]

TABLE 2. ANALYTICAL METHODS AND LABORATORIES
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

Notes:

API = American Petroleum Institute

ASTM = American Society for Testing and Materials

DOE = Department of Energy

EML = Environmental Measurements Laboratory

EPA = United States Environmental Protection Agency

HASL = Health and Safety Laboratory

NELAC = Laboratory is certified to perform the method listed by an accreditating body of the National Environmental Laboratory Accreditation Conference (NELAC)

Not Applicable = Accreditation for the method is not available through the State of Nevada or NELAC

NV = Laboratory is certified to perform the method list by the State of Nevada

SIM = Selective Ion Monitoring

SM = Standard Method

(1) The Standard Operating Procedures (SOP) Date is the most current review or effective date listed on the laboratory's approved SOPs that will be implemented for this project. Laboratories are responsible for notifying Ramboll of any revisions to the SOPs referenced above. The use of revised SOPs are subject to approval.

(2) 1,4-Dioxane and 1,2,3-Trichloropropane will be run by EPA Method 8260B SIM. Pace National SOP does not include 1,2,3-Trichloropropane.

(3) Silicon and phosphorus can also analyzed by this method.

(4) Certain metals will be analyzed by EPA Method 200.8 / 6020 to overcome matrix interference from saline groundwater and/or to achieve lower PQLs and SQLs.

(5) Niobium, palladium, sulfur and/or uranium.

(6) Fluoride, chloride, bromide, sulfate, ortho-phosphate, nitrate, and/or nitrate.

(7) EPA Method 8280 may be used to analyze dioxin samples with concentrations that are too high to be accurately measured by EPA Method 8290. An initial screening will be performed by the laboratory to determine which dioxin analysis method should be used.

(8) Analytical laboratory to be certified before submitting samples.

(9) Eurofins Air Toxics (Folsom, CA) and Microbial Insights (Knoxville, TN) SOPs are proprietary. For documentation purposes Appendix C of this QAPP includes summaries for Eurofins Air Toxics methods and title pages for Microbial Insights methods.

(10) GES performs methods according to ASTM Methods. Date listed is date of ASTM Method adoption/revision; laboratory procedures and ASTM references are included in the GES Quality System Manual.

Sources:

Berman, Q.W. and Kolk, A.J. 2000. Modified Elutriator Method for the Determination of Asbestos in Soil and Bulk Materials, Revision 1. Submitted to the U.S. Environmental Protection Agency, Region 8, May 23.

TABLE 3. SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[2] Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike/LCS %R	Blank Spike/LCS RPD
Metals (mg/kg)											
EPA Method SW6010B, SW6010C											
Aluminum	7429-90-5	100,000	NDEP 2017	10	7.7	-- --	50	75 - 125	20	80 - 120	20
Barium	7440-39-3	100,000	NDEP 2017	5.0	0.75	-- --	50	75 - 125	20	80 - 120	20
Beryllium	7440-41-7	2,540	NDEP 2017	0.50	0.25	-- --	50	75 - 125	20	80 - 120	20
Boron	7440-42-8	100,000	NDEP 2017	5	2.5	-- --	50	75 - 125	20	80 - 120	20
Cadmium	7440-43-9	1,114	NDEP 2017	0.5	0.25	-- --	50	75 - 125	20	80 - 120	20
Calcium	7440-70-2	--	--	25	13.5	-- --	50	75 - 125	20	80 - 120	20
Chromium (total)	7440-47-3	100,000	NDEP 2017	1	0.5	-- --	50	75 - 125	20	80 - 120	20
Cobalt	7440-48-4	385	NDEP 2017	1	0.5	-- --	50	75 - 125	20	80 - 120	20
Copper	7440-50-8	3,670	NDEP 2017	2	1.1	-- --	50	75 - 125	20	80 - 120	20
Iron	7439-89-6	100,000	NDEP 2017	20	6.9	-- --	50	75 - 125	20	80 - 120	20
Lead	7439-92-1	800	NDEP 2015	2	1	-- --	50	75 - 125	20	80 - 120	20
Magnesium	7439-95-4	100,000	NDEP 2017	10	5	-- --	50	75 - 125	20	80 - 120	20
Manganese	7439-96-5	28,100	NDEP 2017	2	1	-- --	50	75 - 125	20	80 - 120	20
Molybdenum	7439-98-7	6,490	NDEP 2017	2	1	-- --	50	75 - 125	20	80 - 120	20
Nickel	7440-02-0	24,700	NDEP 2017	2	1	-- --	50	75 - 125	20	80 - 120	20
Phosphorus	7723-14-0	--	--	50	2.5	-- --	50	75 - 125	20	80 - 120	20
Potassium	7440-09-7	--	--	62.5	32.5	-- --	50	75 - 125	20	80 - 120	20
Silver	7440-22-4	6,490	NDEP 2017	1.5	0.89	-- --	50	75 - 125	20	80 - 120	20
Sodium	7440-23-5	--	--	62.5	32	-- --	50	75 - 125	20	80 - 120	20
Strontium	7440-24-6	100,000	NDEP 2017	5	2.5	-- --	50	75 - 125	20	80 - 120	20
Tin	7440-31-5	100,000	NDEP 2017	10	5	-- --	50	75 - 125	20	80 - 120	20
Titanium	7440-32-6	100,000	NDEP 2017	2	1	-- --	50	75 - 125	20	80 - 120	20
Tungsten	7440-33-7	1,040	NDEP 2017	10	2.5	-- --	50	75 - 125	20	80 - 120	20
Vanadium	7440-62-2	6,420	NDEP 2017	1	0.5	-- --	50	75 - 125	20	80 - 120	20
Zinc	7440-66-6	100,000	NDEP 2017	5	2.5	-- --	50	75 - 125	20	80 - 120	20
Zirconium	7440-67-7	104	NDEP 2017	10	5	-- --	50	75 - 125	20	80 - 120	20

TABLE 3. SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[2] Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike/LCS %R	Blank Spike/LCS RPD
EPA Method SW6020											
Antimony	7440-36-0	519	NDEP 2017	0.50	0.20	-- --	50	75 - 125	20	21 - 251	20
Arsenic	7440-38-2	2.15	NDEP 2017	1.0	0.4	-- --	50	75 - 125	20	70 - 131	20
Selenium	7782-49-2	6,490	NDEP 2017	0.50	0.32	-- --	50	75 - 125	20	69 - 131	20
Thallium	7440-28-0	13	NDEP 2017	0.5	0.20	-- --	50	75 - 125	20	68 - 131	20
EPA Method 6020A											
Niobium	7440-03-1	130	NDEP 2017	2.5	1.2	-- --	50	75 - 125	30	80 - 120	20
Palladium	7440-05-3	--	--	0.1	0.04	-- --	50	75 - 125	30	80 - 120	20
Sulfur	7704-34-9	--	--	50	30.0	-- --	50	75 - 125	30	80 - 120	20
Total Uranium	7440-61-1	3,830	NDEP 2017	0.1	0.04	-- --	50	75 - 125	30	80 - 120	20
EPA Method SW7199											
Chromium (hexavalent)	18540-29-9	7.01	NDEP 2017	0.3	0.15	-- --	50	55 - 110	20	80 - 120	20
EPA Method SW7471A											
Mercury	7439-97-6	3.13	NDEP 2017	0.10	0.049	-- --	50	75 - 125	20	80 - 120	20
Volatile Organic Compounds (mg/kg)											
EPA Method SW8260B											
1,1,1,2-Tetrachloroethane	630-20-6	9.95	NDEP 2017	2.00	0.001	-- --	50	65 - 145	20	70 - 130	20
1,1,1-Trichloroethane	71-55-6	638	NDEP 2017	0.001	0.0005	-- --	50	65 - 145	20	65 - 135	20
1,1,2,2-Tetrachloroethane	79-34-5	3.18	NDEP 2017	0.002	0.001	-- --	50	40 - 160	30	55 - 140	30
1,1,2-Trichloroethane	79-00-5	5.79	NDEP 2017	0.001	0.0005	-- --	50	65 - 140	30	65 - 135	20
1,1-Dichloroethane	75-34-3	17.3	NDEP 2017	0.001	0.0005	-- --	50	65 - 135	25	70 - 130	20
1,1-Dichloroethene	75-35-4	1,100	NDEP 2017	0.002	0.0005	-- --	50	65 - 135	25	70 - 125	20
1,1-Dichloropropene	563-58-6	--	--	0.001	0.0005	-- --	50	65 - 135	20	70 - 130	20
1,2,3-Trichlorobenzene	87-61-6	151	NDEP 2017	0.002	0.001	-- --	50	45 - 145	30	60 - 130	20
1,2,3-Trichloropropane	96-18-4	0.121	NDEP 2017	0.01	0.001	-- --	50	50 - 150	30	60 - 135	25
1,2,4-Trichlorobenzene	120-82-1	125	NDEP 2017	0.005	0.001	-- --	50	50 - 140	30	70 - 135	20
1,2,4-Trimethylbenzene	95-63-6	218	NDEP 2017	0.002	0.001	-- --	50	65 - 140	25	70 - 125	20
1,2-Dibromo-3-Chloropropane	96-12-8	0.0714	NDEP 2017	0.005	0.002	-- --	50	40 - 150	30	50 - 135	30
1,2-Dibromoethane (EDB)	106-93-4	0.184	NDEP 2017	0.001	0.0005	-- --	50	65 - 140	25	70 - 130	20

TABLE 3. SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[2]					
						Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
1,2-Dichlorobenzene	95-50-1	376	NDEP 2017	0.001	0.0005	-- --	50	70 - 130	25	75 - 120	20
1,2-Dichloroethane	107-06-2	2.3	NDEP 2017	0.001	0.0005	-- --	50	60 - 150	25	60 - 140	20
1,2-Dichloropropane	78-87-5	4.98	NDEP 2017	0.001	0.0005	-- --	50	65 - 130	20	70 - 130	20
1,3,5-Trimethylbenzene	108-67-8	182	NDEP 2017	0.002	0.001	-- --	50	65 - 135	25	70 - 125	20
1,3-Dichlorobenzene	541-73-1	373	NDEP 2017	0.001	0.0005	-- --	50	70 - 130	25	75 - 125	20
1,3-Dichloropropane	142-28-9	18,300	NDEP 2017	0.001	0.0005	-- --	50	65 - 140	25	70 - 125	20
1,4-Dichlorobenzene	106-46-7	47.2	NDEP 2017	0.001	0.0005	-- --	50	70 - 130	25	75 - 120	20
2,2-Dichloropropane	594-20-7	--	--	0.002	0.001	-- --	50	65 - 150	25	60 - 145	20
2-Butanone	78-93-3	28,400	NDEP 2017	0.01	0.005	-- --	50	25 - 170	40	40 - 145	35
2-Chlorotoluene	95-49-8	907	NDEP 2017	0.002	0.001	-- --	50	60 - 135	25	70 - 125	20
2-Hexanone	591-78-6	1,650	NDEP 2017	0.010	0.005	-- --	50	35 - 160	40	40 - 150	35
4-Chlorotoluene	106-43-4	18,300	NDEP 2017	0.002	0.001	-- --	50	65 - 135	25	75 - 125	20
4-Methyl-2-pentanone	108-10-1	3,360	NDEP 2017	0.005	0.0025	-- --	50	40 - 155	40	40 - 145	35
Acetone	67-64-1	100,000	NDEP 2017	0.020	0.008	-- --	50	20 - 145	40	25 - 145	30
Benzene	71-43-2	5.82	NDEP 2017	0.001	0.0005	-- --	50	65 - 130	20	65 - 120	20
Bromobenzene	108-86-1	679	NDEP 2017	0.002	0.001	-- --	50	65 - 140	25	75 - 120	20
Bromochloromethane	74-97-5	692	NDEP 2017	0.002	0.001	-- --	50	65 - 145	25	70 - 135	20
Bromodichloromethane	75-27-4	1.43	NDEP 2017	0.001	0.0005	-- --	50	65 - 145	20	70 - 135	20
Bromoform	75-25-2	104	NDEP 2017	0.002	0.001	-- --	50	50 - 145	30	55 - 135	25
Bromomethane	74-83-9	33.3	NDEP 2017	0.002	0.001	-- --	50	60 - 155	25	60 - 145	20
Carbon Tetrachloride	56-23-5	3.24	NDEP 2017	0.002	0.0005	-- --	50	60 - 145	25	65 - 140	20
Chlorobenzene	108-90-7	18,300	NDEP 2017	0.001	0.0005	-- --	50	70 - 130	25	75 - 120	20
Chloroethane	75-00-3	2,110	NDEP 2017	0.002	0.001	-- --	50	60 - 150	25	60 - 140	25
Chloroform	67-66-3	1.53	NDEP 2017	0.001	0.0005	-- --	50	65 - 135	20	70 - 130	20
Chloromethane	74-87-3	510	NDEP 2017	0.002	0.001	-- --	50	40 - 145	25	45 - 145	25
cis-1,2-Dichloroethene	156-59-2	2,360	NDEP 2017	0.001	0.0005	-- --	50	65 - 135	25	70 - 125	20
cis-1,3-Dichloropropene	10061-01-5	25.7	NDEP 2017	0.001	0.0005	-- --	50	70 - 135	25	75 - 125	20
Dibromochloromethane	124-48-1	43.3	NDEP 2017	0.001	0.0005	-- --	50	60 - 145	25	65 - 140	20
Dibromomethane	74-95-3	10,000	NDEP 2017	0.001	0.0005	-- --	50	65 - 140	25	70 - 130	20
Dichlorodifluoromethane	75-71-8	403	NDEP 2017	0.002	0.001	-- --	50	30 - 160	35	35 - 160	30
Diisopropyl ether (DIPE)	108-20-3	2,260	NDEP 2017	0.001	0.001	-- --	50	60 - 150	25	60 - 140	20

TABLE 3. SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[2]					
						Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
Ethylbenzene	100-41-4	233	NDEP 2017	0.001	0.0005	-- --	50	70 - 135	25	70 - 125	20
Ethyl-tert-butyl ether (ETBE)	637-92-3	--	--	0.002	0.001	-- --	50	60 - 145	30	60 - 140	20
Hexachlorobutadiene	87-68-3	6.14	NDEP 2017	0.002	0.001	-- --	50	50 - 145	35	60 - 135	20
Isopropyl benzene	98-82-8	91,600	NDEP 2017	0.001	0.0005	-- --	50	70 - 145	25	75 - 130	20
m,p-Xylene[5]	179601-23-1	387	NDEP 2017	0.002	0.001	-- --	50	70 - 130	25	70 - 125	20
Methylene Chloride	75-09-2	1,550	NDEP 2017	0.01	0.005	-- --	50	55 - 145	25	55 - 135	20
Methyl-tert-butyl ether (MTBE)	1634-04-4	238	NDEP 2017	0.002	0.001	-- --	50	55 - 155	35	60 - 140	25
Naphthalene	91-20-3	18.4	NDEP 2017	0.002	0.001	-- --	50	40 - 150	40	55 - 135	25
n-Butylbenzene	104-51-8	108	NDEP 2017	0.002	0.001	-- --	50	55 - 145	30	70 - 130	20
n-Propylbenzene	103-65-1	264	NDEP 2017	0.001	0.0005	-- --	50	65 - 140	25	70 - 130	20
o-Xylene	95-47-6	434	NDEP 2017	0.001	0.0005	-- --	50	65 - 130	25	70 - 125	20
p-Isopropyltoluene	99-87-6	647	NDEP 2017	0.001	0.0005	-- --	50	60 - 140	25	75 - 125	20
sec-Butylbenzene	135-98-8	145	NDEP 2017	0.002	0.001	-- --	50	60 - 135	25	70 - 125	20
Styrene	100-42-5	867	NDEP 2017	0.001	0.0005	-- --	50	70 - 140	25	75 - 130	20
tert-Amyl-methyl ether (TAME)	994-05-8	--	--	0.002	0.001	-- --	50	60 - 150	25	60 - 145	20
tert-Butyl alcohol (TBA)	75-65-0	21,300	NDEP 2017	0.050	0.01	-- --	50	65 - 145	30	70 - 135	20
tert-Butylbenzene	98-06-6	183	NDEP 2017	0.002	0.001	-- --	50	60 - 140	25	70 - 125	20
Tetrachloroethene	127-18-4	117	NDEP 2017	0.001	0.0005	-- --	50	65 - 135	25	70 - 125	20
Toluene	108-88-3	817	NDEP 2017	0.001	0.0005	-- --	50	70 - 130	20	70 - 125	20
trans-1,2-Dichloroethene	156-60-5	183,000	NDEP 2017	0.001	0.0005	-- --	50	70 - 135	25	70 - 125	20
trans-1,3-Dichloropropene	10061-02-6	--	--	0.001	0.0005	-- --	50	60 - 145	25	70 - 135	20
Trichloroethene	79-01-6	6.92	NDEP 2017	0.00	0.0005	-- --	50	65 - 140	25	70 - 125	20
Trichlorofluoromethane	75-69-4	1,210	NDEP 2017	0.002	0.001	-- --	50	55 - 155	25	60 - 145	25
Vinyl chloride	75-01-4	2.21	NDEP 2017	0.002	0.001	-- --	50	55 - 140	30	55 - 135	25
4-Bromofluorobenzene (Surr)	460-00-4	--	--	--	--	79 - 120	--	-- --	--	-- --	--
Dibromofluoromethane (Surr)	1868-53-7	--	--	--	--	60 - 120	--	-- --	--	-- --	--
Toluene-d8 (Surr)	2037-26-5	--	--	--	--	79 - 123	--	-- --	--	-- --	--

TABLE 3. SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[2] Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike/LCS %R	Blank Spike/LCS RPD
EPA Method SW8260B SIM											
1,2,3-Trichloropropane	96-18-4	0.121	NDEP 2017	0.01	0.004	-- --	50	50 - 150	30	60 - 135	25
1,4-dioxane	123-91-1	36.3	NDEP 2017	0.005	0.0011	-- --	50	70 - 130	30	70 - 130	30
Dibromofluoromethane (Surr	1868-53-7	--	--	--	--	80 - 125	--	-- --	--	-- --	--
Semivolatile Organic Compounds (mg/kg)											
EPA Method SW8270C, SW8270D											
1-Methylnaphthalene	90-12-0	81.3	NDEP 2017	0.250	0.110	-- --	50	60 - 140	30	60 - 140	30
2,4,5-Trichlorophenol	95-95-4	91,600	NDEP 2017	0.500	0.200	-- --	50	45 - 120	20	50 - 120	20
2,4,6-Trichlorophenol	88-06-2	233	NDEP 2017	0.500	0.160	-- --	50	45 - 120	25	50 - 120	20
2,4-Dichlorophenol	120-83-2	3,220	NDEP 2017	0.250	0.0500	-- --	50	45 - 120	25	45 - 120	20
2,4-Dimethylphenol	105-67-9	18,300	NDEP 2017	0.250	0.0980	-- --	50	30 - 120	25	40 - 120	20
2,4-Dinitrophenol	51-28-5	1,830	NDEP 2017	1.00	0.750	-- --	50	20 - 120	25	25 - 120	25
2,4-Dinitrotoluene	121-14-2	8.30	NDEP 2017	0.250	0.0600	-- --	50	50 - 125	25	55 - 125	20
2,6-Dinitrotoluene	606-20-2	2.36	NDEP 2017	0.250	0.0710	-- --	50	50 - 125	20	55 - 125	20
2-Chloronaphthalene	91-58-7	175	NDEP 2017	0.250	0.0500	-- --	50	45 - 120	20	45 - 120	20
2-Chlorophenol	95-57-8	6,490	NDEP 2017	0.250	0.0520	-- --	50	40 - 120	20	40 - 120	20
2-Methylnaphthalene	91-57-6	368	NDEP 2017	0.250	0.0520	-- --	50	40 - 120	20	45 - 120	20
2-Methylphenol	95-48-7	45,800	NDEP 2017	0.250	0.0600	-- --	50	40 - 120	25	40 - 120	20
2-Nitroaniline	88-74-4	8,880	NDEP 2017	0.250	0.170	-- --	50	45 - 120	25	50 - 125	20
2-Nitrophenol	88-75-5	--	--	0.250	0.100	-- --	50	40 - 120	25	45 - 120	20
3,3'-Dichlorobenzidine	91-94-1	5.70	NDEP 2017	0.500	0.110	-- --	50	20 - 130	25	20 - 130	25
3-Methylphenol + 4-Methylphenol	106-44-5	45,800	NDEP 2017	0.250	0.100	-- --	50	50 - 120	25	50 - 120	20
3-Nitroaniline	99-09-2	--	--	0.250	0.100	-- --	50	30 - 120	25	35 - 120	25
4-Bromophenyl phenyl ether	101-55-3	--	--	0.250	0.0560	-- --	50	45 - 120	20	45 - 120	20
4-Chloro-3-methylphenol	59-50-7	91,600	NDEP 2017	0.400	0.150	-- --	50	50 - 125	25	50 - 125	20
4-Chloroaniline	106-47-8	18.2	NDEP 2017	0.500	0.150	-- --	50	20 - 120	30	20 - 120	30
4-Chlorophenyl phenyl ether	7005-72-3	--	--	0.500	0.200	-- --	50	50 - 120	25	55 - 120	20
4-Nitroaniline	100-01-6	128	NDEP 2017	0.500	0.100	-- --	50	40 - 125	30	45 - 125	20

TABLE 3. SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[2] Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike/LCS %R	Blank Spike/LCS RPD
4-Nitrophenol	100-02-7	7,330	NDEP 2017	1.00	0.500	-- --	50	35 - 125	30	40 - 125	20
Acenaphthene	83-32-9	118	NDEP 2017	0.250	0.130	-- --	50	45 - 120	25	50 - 120	20
Acenaphthylene	208-96-8	--	--	0.250	0.0520	-- --	50	45 - 120	20	50 - 120	20
Aniline	62-53-3	450	NDEP 2017	0.500	0.140	-- --	50	25 - 120	30	25 - 120	20
Anthracene	120-12-7	4.26	NDEP 2017	0.250	0.0600	-- --	50	55 - 120	25	55 - 120	20
Benzidine	92-87-5	0.0112	NDEP 2017	1.30	0.170	-- --	50	20 - 120	30	20 - 120	30
Benzo[a]anthracene	56-55-3	3.23	NDEP 2017	0.250	0.0520	-- --	50	50 - 120	25	55 - 120	20
Benzo[a]pyrene	50-32-8	0.323	NDEP 2017	0.250	0.0500	-- --	50	45 - 125	25	50 - 125	20
Benzo[b]fluoranthene	205-99-2	3.23	NDEP 2017	0.250	0.0520	-- --	50	45 - 125	30	45 - 125	25
Benzo[g,h,i]perylene	191-24-2	25,300	NDEP 2017	0.250	0.0820	-- --	50	25 - 130	30	35 - 130	25
Benzo[k]fluoranthene	207-08-9	32.3	NDEP 2017	0.250	0.0520	-- --	50	45 - 125	30	45 - 125	25
Benzoic acid	65-85-0	100,000	NDEP 2017	0.750	0.360	-- --	50	20 - 120	30	20 - 120	30
Benzyl alcohol	100-51-6	91,600	NDEP 2017	1.30	0.410	-- --	50	20 - 120	30	35 - 120	25
Bis(2-chloroethoxy)methane	111-91-1	2,750	NDEP 2017	0.250	0.100	-- --	50	45 - 120	25	45 - 120	20
Bis(2-chloroethyl)ether	111-44-4	1.35	NDEP 2017	0.250	0.0520	-- --	50	35 - 110	25	35 - 120	25
Bis(2-ethylhexyl) phthalate	117-81-7	183	NDEP 2017	0.250	0.0680	-- --	50	45 - 130	25	50 - 130	20
Butyl benzyl phthalate	85-68-7	1,350	NDEP 2017	0.250	0.0600	-- --	50	45 - 125	25	50 - 125	20
Chrysene	218-01-9	323	NDEP 2017	0.250	0.0560	-- --	50	55 - 120	25	55 - 120	20
Dibenz(a,h)anthracene	53-70-3	0.323	NDEP 2017	0.250	0.0750	-- --	50	25 - 135	30	40 - 135	25
Dibenzofuran	132-64-9	171	NDEP 2017	0.250	0.140	-- --	50	50 - 120	25	55 - 120	20
Diethyl phthalate	84-66-2	100,000	NDEP 2017	0.250	0.0710	-- --	50	50 - 125	25	50 - 125	20
Dimethylphthalate	131-11-3	100,000	NDEP 2017	0.250	0.0500	-- --	50	45 - 125	25	50 - 125	20
Di-n-butyl phthalate	84-74-2	91,600	NDEP 2017	0.250	0.0680	-- --	50	50 - 125	25	50 - 125	20
Di-n-octyl phthalate	117-84-0	9,160	NDEP 2017	0.250	0.0680	-- --	50	50 - 135	25	50 - 135	20
Fluoranthene	206-44-0	33,700	NDEP 2017	0.330	0.160	-- --	50	45 - 120	25	55 - 120	20
Fluorene	86-73-7	93.1	NDEP 2017	0.250	0.0520	-- --	50	50 - 120	25	55 - 120	20
Hexachlorobenzene	118-74-1	0.231	NDEP 2017	0.250	0.0520	-- --	50	50 - 120	25	50 - 120	20
Hexachlorocyclopentadiene	77-47-4	15.7	NDEP 2017	0.750	0.310	-- --	50	20 - 125	30	30 - 125	25
Hexachloroethane	67-72-1	65.5	NDEP 2017	0.250	0.0700	-- --	50	35 - 120	30	40 - 120	20
Indeno[1,2,3-cd]pyrene	193-39-5	3.23	NDEP 2017	0.250	0.0980	-- --	50	20 - 130	30	30 - 135	25

TABLE 3. SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source(1)	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS(2) Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike/LCS %R	Blank Spike/LCS RPD
Isophorone	78-59-1	2700	NDEP 2017	0.250	0.0500	-- --	50	40 - 120	25	40 - 120	20
Naphthalene	91-20-3	290	NDEP 2017	0.250	0.0500	-- --	50	40 - 120	25	45 - 120	20
Nitrobenzene	98-95-3	24.7	NDEP 2017	0.250	0.0520	-- --	50	40 - 120	25	45 - 120	20
N-Nitrosodi-n-propylamine	621-64-7	0.366	NDEP 2017	0.250	0.0520	-- --	50	35 - 120	25	40 - 120	20
N-Nitrosodiphenylamine	86-30-6	524	NDEP 2017	0.500	0.160	-- --	50	45 - 125	25	50 - 120	20
Octachlorostyrene	29082-74-4	--	--	0.650	0.120	-- --	50	60 - 140	30	60 - 140	30
Pentachlorophenol	87-86-5	4	NDEP 2017	0.500	0.260	-- --	50	30 - 120	25	40 - 120	20
Phenanthrene	85-01-8	24.5	NDEP 2017	0.330	0.150	-- --	50	50 - 120	25	50 - 120	20
Phenol	108-95-2	100,000	NDEP 2017	0.250	0.0680	-- --	50	40 - 120	25	40 - 120	20
Pyrene	129-00-0	44	NDEP 2017	0.250	0.100	-- --	50	40 - 125	30	45 - 125	25
Pyridine	110-86-1	1,300	NDEP 2017	0.340	0.110	-- --	50	25 - 130	30	25 - 130	30
2-Fluorophenol (Surr)	367-12-4	--	--	--	--	18 - 138	--	-- --	--	-- --	--
2,4,6-Tribromophenol (Surr)	118-79-6	--	--	--	--	10 - 147	--	-- --	--	-- --	--
Nitrobenzene-d5 (Surr)	4165-60-0	--	--	--	--	39 - 104	--	-- --	--	-- --	--
Terphenyl-d14 (Surr)	1718-51-0	--	--	--	--	43 - 125	--	-- --	--	-- --	--
Phenol-d6 (Surr)	13127-88-3	--	--	--	--	37 - 125	--	-- --	--	-- --	--
EPA Method SW8315A											
Formaldehyde	50-00-0	79.9	NDEP 2017	1	0.5	-- --	50	50 - 150	20	50 - 150	20
Polyaromatic Hydrocarbons (mg/kg)											
EPA Method SW8270C SIM											
Acenaphthene	83-32-9	118	NDEP 2017	0.03	0.004	-- --	50	10 - 150	39	48 - 120	40
Acenaphthylene	208-96-8	--	--	0.03	0.004	-- --	50	23 - 114	38	47 - 120	40
Anthracene	120-12-7	4.26	NDEP 2017	0.03	0.004	-- --	50	10 - 150	40	46 - 120	40
Benzo(a)anthracene	56-55-3	3.23	NDEP 2017	0.03	0.004	-- --	50	10 - 150	40	48 - 120	40
Benzo(a)pyrene	50-32-8	0.323	NDEP 2017	0.03	0.004	-- --	50	10 - 150	40	48 - 120	40
Benzo(b)fluoranthene	205-99-2	3.23	NDEP 2017	0.03	0.004	-- --	50	10 - 150	40	49 - 120	40
Benzo(g,h,i)perylene	191-24-2	25,300	NDEP 2017	0.03	0.004	-- --	50	10 - 143	40	38 - 127	40
Benzo(k)fluoranthene	207-08-9	32.3	NDEP 2017	0.03	0.004	-- --	50	10 - 150	40	48 - 120	40
Chrysene	218-01-9	323	NDEP 2017	0.03	0.004	-- --	50	10 - 150	40	48 - 120	40

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QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[2] Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
Dibenz(a,h)anthracene	53-70-3	0.323	NDEP 2017	0.03	0.004	-- --	50	10 - 127	40	39 - 120	40
Fluoranthene	206-44-0	33,700	NDEP 2017	0.03	0.004	-- --	50	10 - 150	40	46 - 120	40
Fluorene	86-73-7	93.1	NDEP 2017	0.03	0.004	-- --	50	10 - 150	40	47 - 120	40
Indeno(1,2,3-cd)pyrene	193-39-5	3.23	NDEP 2017	0.03	0.004	-- --	50	10 - 138	40	42 - 120	40
Naphthalene	91-20-3	18.4	NDEP 2017	0.03	0.004	-- --	50	10 - 150	40	46 - 120	40
Phenanthrene	85-01-8	24.5	NDEP 2017	0.03	0.004	-- --	50	10 - 150	40	47 - 120	40
Pyrene	129-00-0	44	NDEP 2017	0.03	0.004	-- --	50	10 - 150	40	46 - 120	40
2-Fluorobiphenyl (Surr)	321-60-8	--	--	--	--	29 - 120	--	-- --	--	-- --	--
Nitrobenzene-d5 (Surr)	4165-60-0	--	--	--	--	11 - 118	--	-- --	--	-- --	--
Terphenyl-d14 (Surr)	1718-51-0	--	--	--	--	10 - 120	--	-- --	--	-- --	--
Organophosphorous Pesticides (mg/kg)											
EPA Method SW8141A											
Atrazine	1912-24-9	11.2	NDEP 2017	0.067	0.0121	-- --	50	49 - 115	50	49 - 115	50
Azinphos-methyl	86-50-0	2,750	NDEP 2017	0.013	0.0035	-- --	50	51 - 122	43	51 - 122	43
Bolstar (Sulprofos)	35400-43-2	--	--	0.013	0.00424	-- --	50				
Chlorpyrifos	2921-88-2	916	NDEP 2017	0.020	0.00646	-- --	50	38 - 130	37	38 - 130	37
Coumaphos	56-72-4	--	--	0.013	0.0028	-- --	50	50 - 119	27	50 - 119	27
Demeton, Total	8065-48-3	36.7	NDEP 2017	0.039	0.00752	-- --	50	36 - 115	47	36 - 115	47
Demeton-O	298-03-3	--	--	0.039	0.00529	-- --	50				
Demeton-S	126-75-0	--	--	0.015	0.00486	-- --	50				
Diazinon	333-41-5	732	NDEP 2017	0.022	0.00727	-- --	50	53 - 115	40	53 - 115	40
Dichlorvos	62-73-7	8.85	NDEP 2017	0.023	0.0074	-- --	50	43 - 139	77	43 - 139	77
Dimethoate	60-51-5	183	NDEP 2017	0.022	0.00708	-- --	50	25 - 138	98	25 - 138	98
Disulfoton	298-04-4	51.9	NDEP 2017	0.048	0.00773	-- --	50	29 - 115	40	29 - 115	40
EPN (Ethyl P-Nitrophenyl Benzenethiophosphate)	2104-64-5	13	NDEP 2017	0.013	0.00368	-- --	50	58 - 131	50	58 - 131	50
Ethoprop	13194-48-4	--	--	0.015	0.00493	-- --	50	53 - 115	54	53 - 115	54
Famphur	52-85-7	--	--	0.013	0.00322	-- --	50	49 - 140	31	49 - 140	31
Fensulfothion	115-90-2	--	--	0.025	0.00815	-- --	50	52 - 121	49	52 - 121	49
Fenthion	55-38-9	--	--	0.033	0.00874	-- --	50	45 - 115	43	45 - 115	43
Malathion	121-75-5	18,300	NDEP 2017	0.015	0.00464	-- --	50	50 - 122	53	50 - 122	53

TABLE 3. SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[2] Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike/LCS %R	Blank Spike/LCS RPD
Merphos	150-50-5	1.03	NDEP 2017	0.030	0.00514	-- --	50	19 - 115	50	19 - 115	50
Mevinphos	7786-34-7	--	--	0.015	0.00462	-- --	50	10 - 226	78	10 - 226	78
Naled	300-76-5	1.29	NDEP 2017	0.070	0.0226	-- --	50	10 - 115		10 - 115	
Parathion-ethyl	56-38-2	5,500	NDEP 2017	0.018	0.00529	-- --	50	24 - 163	47	24 - 163	47
Parathion-methyl	298-00-0	229	NDEP 2017	0.020	0.00637	-- --	50	46 - 119	53	46 - 119	53
Phorate	298-02-2	183	NDEP 2017	0.020	0.0057	-- --	50	40 - 115	40	40 - 115	40
Ronnel	299-84-3	26.8	NDEP 2017	0.046	0.0152	-- --	50	43 - 118	41	43 - 118	41
Simazine	122-34-9	--	--	0.067	0.0221	-- --	50	11 - 179	58	11 - 179	58
Stirphos (Tetrachlorovinphos)	22248-79-9	107	NDEP 2017	0.015	0.00436	-- --	50	44 - 118	24	44 - 118	24
Sulfotepp	3689-24-5	458	NDEP 2017	0.020	0.00626	-- --	50	55 - 115	40	55 - 115	
Thionazin	297-97-2	--	--	0.018	0.00557	-- --	50	46 - 115	40	46 - 115	40
Tokuthion	34643-46-4	--	--	0.020	0.00391	-- --	50				
Trichloronate	327-98-0	--	--	0.020	0.00625	-- --	50	27 - 115	43	27 - 115	43
Chlormefos (Surr)	24934-91-6	--	--	--	--	42 - 132	--	-- --	--	-- --	--
Triphenylphosphate (Surr)	115-86-6	--	--	--	--	47 - 161	--	-- --	--	-- --	--
Organochlorine Pesticides (mg/kg)											
EPA Method SW8081A, SW8081B											
2,4'-DDE	3424-82-6	--	--	0.005	0.0015	-- --	50	10 - 150	30	10 - 150	30
4,4'-DDD	72-54-8	15.1	NDEP 2017	0.005	0.0015	-- --	50	10 - 150	30	59 - 118	30
4,4'-DDE	72-55-9	9.5	NDEP 2017	0.005	0.0015	-- --	50	10 - 150	30	55 - 115	30
4,4'-DDT	50-29-3	7.55	NDEP 2017	0.005	0.0015	-- --	50	13 - 141	30	60 - 131	30
Aldrin	309-00-2	0.214	NDEP 2017	0.005	0.0015	-- --	50	10 - 150	30	53 - 115	30
alpha-BHC	319-84-6	0.494	NDEP 2017	0.005	0.0015	-- --	50	12 - 125	30	57 - 115	30
alpha-Chlordane	57-74-9	7.33	NDEP 2017	0.050	0.01	-- --	50	10 - 150	30	58 - 115	30
beta-BHC	319-85-7	1.73	NDEP 2017	0.005	0.0015	-- --	50	10 - 150	30	56 - 115	30
delta-BHC	319-86-8	334	NDEP 2017	0.010	0.0015	-- --	50	12 - 130	30	52 - 115	30
Dieldrin	60-57-1	0.16	NDEP 2017	0.005	0.0015	-- --	50	10 - 150	30	57 - 115	30
Endosulfan I	959-98-8	5,500	NDEP 2017	0.005	0.0015	-- --	50	10 - 150	30	56 - 115	30
Endosulfan II	33213-65-9	5,500	NDEP 2017	0.005	0.0015	-- --	50	10 - 150	30	60 - 117	30
Endosulfan sulfate	1031-07-8	5,500	NDEP 2017	0.010	0.002	-- --	50	10 - 150	30	60 - 115	30

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QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

						QUALITY CONTROL LIMITS[2]					
				Practical Quantitation Limit	Method Detection Limit	Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	(PQL)	(MDL)	%R	RPD	%R	RPD	%R	RPD
Endrin	72-20-8	30.2	NDEP 2017	0.005	0.0015	-- --	50	10 - 150	30	61 - 120	30
Endrin aldehyde	7421-93-4	30.2	NDEP 2017	0.005	0.0015	-- --	50	10 - 131	30	54 - 115	30
Endrin Ketone	53494-70-5	30.2	NDEP 2017	0.005	0.002	-- --	50	10 - 134	30	54 - 119	30
gamma-BHC (Lindane)	58-89-9	2.83	NDEP 2017	0.005	0.0015	-- --	50	20 - 119	30	56 - 115	30
gamma-Chlordane	57-74-9	7.33	NDEP 2017	0.050	0.01	-- --	50	10 - 150	30	52 - 115	30
Heptachlor	76-44-8	0.807	NDEP 2017	0.005	0.002	-- --	50	10 - 150	30	59 - 115	30
Heptachlor epoxide	1024-57-3	0.399	NDEP 2017	0.005	0.002	-- --	50	10 - 150	30	60 - 133	30
Methoxychlor	72-43-5	4,580	NDEP 2017	0.005	0.0015	-- --	50	10 - 150	30	65 - 120	30
Toxaphene	8001-35-2	2.33	NDEP 2017	0.200	0.05	-- --	50	60 - 140	30	60 - 140	30
Decachlorobiphenyl (Surr)	2051-24-3	--	--	--	--	45 - 120	--	-- --	--	-- --	--
Dioxins/Furans (pg/g)[4]											
EPA Method SW8290 or SW8280											
2,3,7,8- TCDD	1746-01-6	19.7	NDEP 2017	1	EDL[3]	-- --	50	60 - 138	20	60 - 138	20
OCDF	39001-02-0	--	--	10	EDL[3]	-- --	50	63 - 141	20	63 - 141	20
OCDD	3268-87-9	--	--	10	EDL[3]	-- --	50	70 - 128	20	70 - 128	20
1,2,3,4,6,7,8-HpCDF	67562-39-4	--	--	5	EDL[3]	-- --	50	71 - 134	20	71 - 134	20
1,2,3,4,6,7,8-HpCDD	35822-46-9	--	--	5	EDL[3]	-- --	50	71 - 128	20	71 - 128	20
1,2,3,4,7,8,9-HpCDF	55673-89-7	--	--	5	EDL[3]	-- --	50	68 - 129	20	68 - 129	20
1,2,3,4,7,8-HxCDF	70648-26-9	--	--	5	EDL[3]	-- --	50	74 - 128	20	74 - 128	20
1,2,3,4,7,8-HxCDD	39227-28-6	--	--	5	EDL[3]	-- --	50	60 - 138	20	60 - 138	20
1,2,3,6,7,8-HxCDF	57117-44-9	--	--	5	EDL[3]	-- --	50	67 - 140	20	67 - 140	20
1,2,3,6,7,8-HxCDD	57653-85-7	--	--	5	EDL[3]	-- --	50	68 - 136	20	68 - 136	20
1,2,3,7,8,9-HxCDF	72918-21-9	--	--	5	EDL[3]	-- --	50	72 - 134	20	72 - 134	20
1,2,3,7,8,9-HxCDD	19408-74-3	--	--	5	EDL[3]	-- --	50	68 - 138	20	68 - 138	20
1,2,3,7,8-PeCDF	57117-41-6	--	--	5	EDL[3]	-- --	50	69 - 134	20	69 - 134	20
1,2,3,7,8-PeCDD	40321-76-4	--	--	5	EDL[3]	-- --	50	70 - 122	20	70 - 122	20

TABLE 3. SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[2] Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike/LCS %R	Blank Spike/LCS RPD
2,3,4,6,7,8-HxCDF	60851-34-5	--	--	5	EDL[3]	-- --	50	71 - 137	20	71 - 137	20
1,2,3,6,7,8-HxCDF	57117-44-9	--	--	5	EDL[3]	-- --	50	67 - 140	20	67 - 140	20
2,3,7,8-TCDF	51207-31-9	--	--	1	EDL[3]	-- --	50	56 - 158	20	56 - 158	20
PCBs as Congeners (mg/kg) [4]											
EPA Method 1668A											
Total PCBs	1336-36-3	1.15	NDEP 2017	0.0002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2-MoCB (PCB-1)	2051-60-7	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
3-MoCB (PCB-2)	2051-61-8	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
4-MoCB (PCB-3)	2051-62-9	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2'-DiCB (PCB-4)	13029-08-8	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3-DiCB (PCB-5)	16605-91-7	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3'-DiCB (PCB-6)	25569-80-6	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,4-DiCB (PCB-7)	33284-50-3	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,4'-DiCB (PCB-8)	34883-43-7	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,5-DiCB (PCB-9)	34883-39-1	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,6-DiCB (PCB-10)	33146-45-1	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
3,3'-DiCB (PCB-11)	2050-67-1	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
3,4-DiCB (PCB-12)	2974-92-7	1.15	NDEP 2017	0.00004	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
3,4'-DiCB (PCB-13)	2974-90-5	1.15	NDEP 2017	0.00004	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
3,5-DiCB (PCB-14)	34883-41-5	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
4,4'-DiCB (PCB-15)	2050-68-2	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3-TrCB (PCB-16)	38444-78-9	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',4-TrCB (PCB-17)	37680-66-3	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',5-TrCB (PCB-18)	37680-65-2	1.15	NDEP 2017	0.00004	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',6-TrCB (PCB-19)	38444-73-4	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,3'-TrCB (PCB-20)	38444-84-7	1.15	NDEP 2017	0.00004	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,4-TrCB (PCB-21)	55702-46-0	1.15	NDEP 2017	0.00004	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,4'-TrCB (PCB-22)	38444-85-8	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,5-TrCB (PCB-23)	55720-44-0	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,6-TrCB (PCB-24)	55702-45-9	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50

TABLE 3. SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source(1)	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS(2) Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
2,3',4-TrCB (PCB-25)	55712-37-3	1.15	NDEP 2017	0.00002	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,3',5-TrCB (PCB-26)	38444-81-4	1.15	NDEP 2017	0.00004	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,3',6-TrCB (PCB-27)	38444-76-7	1.15	NDEP 2017	0.00002	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,4,4'-TrCB (PCB-28)	7012-37-5	1.15	NDEP 2017	0.00004	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,4,5-TrCB (PCB-29)	15862-07-4	1.15	NDEP 2017	0.00004	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,4,6-TrCB (PCB-30)	35693-92-6	1.15	NDEP 2017	0.00004	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,4',5-TrCB (PCB-31)	16606-02-3	1.15	NDEP 2017	0.00002	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,4',6-TrCB (PCB-32)	38444-77-8	1.15	NDEP 2017	0.00002	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2',3,4-TrCB (PCB-33)	38444-86-9	1.15	NDEP 2017	0.00004	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2',3,5-TrCB (PCB-34)	37680-68-5	1.15	NDEP 2017	0.00002	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
3,3',4-TrCB (PCB-35)	37680-69-6	1.15	NDEP 2017	0.00002	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
3,3',5-TrCB (PCB-36)	38444-87-0	1.15	NDEP 2017	0.00002	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
3,4,4'-TrCB (PCB-37)	38444-90-5	1.15	NDEP 2017	0.00002	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
3,4,5-TrCB (PCB-38)	53555-66-1	1.15	NDEP 2017	0.00002	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
3,4',5-TrCB (PCB-39)	38444-88-1	1.15	NDEP 2017	0.00002	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,2',3,3'-TeCB (PCB-40)	38444-93-8	1.15	NDEP 2017	0.00004	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,2',3,4-TeCB (PCB-41)	52663-59-9	1.15	NDEP 2017	0.00002	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,2',3,4'-TeCB (PCB-42)	36559-22-5	1.15	NDEP 2017	0.00002	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,2',3,5-TeCB (PCB-43)	70362-46-8	1.15	NDEP 2017	0.00002	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,2',3,5'-TeCB (PCB-44)	41464-39-5	1.15	NDEP 2017	0.00006	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,2',3,6-TeCB (PCB-45)	70362-45-7	1.15	NDEP 2017	0.00002	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,2',3,6'-TeCB (PCB-46)	41464-47-5	1.15	NDEP 2017	0.00002	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,2',4,4'-TeCB (PCB-47)	2437-79-8	1.15	NDEP 2017	0.00006	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,2',4,5-TeCB (PCB-48)	70362-47-9	1.15	NDEP 2017	0.00002	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,2',4,5'-TeCB (PCB-49)	41464-40-8	1.15	NDEP 2017	0.00004	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,2',4,6-TeCB (PCB-50)	62796-65-0	1.15	NDEP 2017	0.00004	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,2',4,6'-TeCB (PCB-51)	68194-04-7	1.15	NDEP 2017	0.00002	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,2',5,5'-TeCB (PCB-52)	35693-99-3	1.15	NDEP 2017	0.00002	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,2',5,6'-TeCB (PCB-53)	41464-41-9	1.15	NDEP 2017	0.00004	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,2',6,6'-TeCB (PCB-54)	15968-05-5	1.15	NDEP 2017	0.00002	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,3,3',4'-TeCB (PCB-55)	74338-24-2	1.15	NDEP 2017	0.00002	EDL(3)	-- --	50	50 - 150	50	50 - 150	50

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QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[2]					
						Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
2,3,3',4'-TeCB (PCB-56)	41464-43-1	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,3',5-TeCB (PCB-57)	70424-67-8	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,3',5'-TeCB (PCB-58)	41464-49-7	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,3',6-TeCB (PCB-59)	74472-33-6	1.15	NDEP 2017	0.00006	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,4,4'-TeCB (PCB-60)	33025-41-1	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,4,5-TeCB (PCB-61)	33284-53-6	1.15	NDEP 2017	0.00008	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,4,6-TeCB (PCB-62)	54230-22-7	1.15	NDEP 2017	0.00006	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,4',5-TeCB (PCB-63)	74472-34-7	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,4',6-TeCB (PCB-64)	52663-58-8	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,5,6-TeCB (PCB-65)	33284-54-7	1.15	NDEP 2017	0.00006	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3',4,4'-TeCB (PCB-66)	32598-10-0	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3',4,5-TeCB (PCB-67)	73575-53-8	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3',4,5'-TeCB (PCB-68)	73575-52-7	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3',4,6-TeCB (PCB-69)	60233-24-1	1.15	NDEP 2017	0.00004	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3',4',5-TeCB (PCB-70)	32598-11-1	1.15	NDEP 2017	0.00008	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3',4',6-TeCB (PCB-71)	41464-46-4	1.15	NDEP 2017	0.00004	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3',5,5'-TeCB (PCB-72)	41464-42-0	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3',5',6-TeCB (PCB-73)	74338-23-1	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,4,4',5-TeCB (PCB-74)	32690-93-0	1.15	NDEP 2017	0.00008	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,4,4',6-TeCB (PCB-75)	32598-12-2	1.15	NDEP 2017	0.00006	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2',3,4,5-TeCB (PCB-76)	70362-48-0	1.15	NDEP 2017	0.00008	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
3,3',4,4'-TeCB (PCB-77)	32598-13-3	0.177	NDEP 2017	0.00000	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
3,3',4,5-TeCB (PCB-78)	70362-49-1	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
3,3',4,5'-TeCB (PCB-79)	41464-48-6	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
3,3',5,5'-TeCB (PCB-80)	33284-52-5	1.15	NDEP 2017	0.00002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
3,4,4',5-TeCB (PCB-81)	70362-50-4	0.0589	NDEP 2017	0.000002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,3',4-PeCB (PCB-82)	52663-62-4	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,3',5-PeCB (PCB-83)	60145-20-2	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,3',6-PeCB (PCB-84)	52663-60-2	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,4,4'-PeCB (PCB-85)	65510-45-4	1.15	NDEP 2017	0.000060	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,4,5-PeCB (PCB-86)	55312-69-1	1.15	NDEP 2017	0.000120	EDL[3]	-- --	50	50 - 150	50	50 - 150	50

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QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[2] Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
2,2',3,4,5'-PeCB (PCB-87)	38380-02-8	1.15	NDEP 2017	0.000120	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,4,6-PeCB (PCB-88)	55215-17-3	1.15	NDEP 2017	0.000040	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,4,6'-PeCB (PCB-89)	73575-57-2	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,4',5-PeCB (PCB-90)	68194-07-0	1.15	NDEP 2017	0.000060	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,4',6-PeCB (PCB-91)	68194-05-8	1.15	NDEP 2017	0.000040	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,5,5'-PeCB (PCB-92)	52663-61-3	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,5,6-PeCB (PCB-93)	73575-56-1	1.15	NDEP 2017	0.000040	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,5,6'-PeCB (PCB-94)	73575-55-0	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,5',6-PeCB (PCB-95)	38379-99-6	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,6,6'-PeCB (PCB-96)	73575-54-9	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3',4,5-PeCB (PCB-97)	41464-51-1	1.15	NDEP 2017	0.000120	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3',4,6-PeCB (PCB-98)	60233-25-2	1.15	NDEP 2017	0.000040	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',4,4',5-PeCB (PCB-99)	38380-01-7	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',4,4',6-PeCB (PCB-100)	39485-83-1	1.15	NDEP 2017	0.000040	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',4,5,5'-PeCB (PCB-101)	37680-73-2	1.15	NDEP 2017	0.000060	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',4,5,6'-PeCB (PCB-102)	68194-06-9	1.15	NDEP 2017	0.000040	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',4,5,'6-PeCB (PCB-103)	60145-21-3	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',4,6,6'-PeCB (PCB-104)	56558-16-8	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,3',4,4'-PeCB (PCB-105)	32598-14-4	0.589	NDEP 2017	0.000002	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,3',4,5-PeCB (PCB-106)	70424-69-0	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,3',4',5-PeCB (pCB-107)	70424-68-9	1.15	NDEP 2017	0.000040	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,3',4,5'-PeCB (PCB-108)	70362-41-3	1.15	NDEP 2017	0.000120	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,3',4,6-PeCB (PCB-109)	74472-35-8	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,3',4',6-PeCB (PCB-110)	38380-03-9	1.15	NDEP 2017	0.000040	EDL[3]	-- --	50	50 - 150	50	50 - 150	50

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QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source(1)	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS(2) Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
2,3,3',5,5'-PeCB (PCB-111)	39635-32-0	1.15	NDEP 2017	0.000020	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,3,3',5,6-PeCB (PCB-112)	74472-36-9	1.15	NDEP 2017	0.000020	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,3,3',5',6-PeCB (PCB-113)	68194-10-5	1.15	NDEP 2017	0.000060	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,3,4,4',5-PeCB (PCB-114)	74472-37-0	0.589	NDEP 2017	0.000002	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,3,4,4',6-PeCB (PCB-115)	74472-38-1	1.15	NDEP 2017	0.000040	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,3,4,5,6-PeCB (PCB-116)	18259-05-7	1.15	NDEP 2017	0.000060	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,3,4',5,6-PeCB (PCB-117)	68194-11-6	1.15	NDEP 2017	0.000060	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,3',4,4',5-PeCB (PCB-118)	31508-00-6	0.589	NDEP 2017	0.000002	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,3',4,4',6-PeCB (PCB-119)	56558-17-9	1.15	NDEP 2017	0.000120	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,3',4,5,5'-PeCB (PCB-120)	68194-12-7	1.15	NDEP 2017	0.000020	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,3',4,5,'6-PeCB (PCB-121)	56558-18-0	1.15	NDEP 2017	0.000020	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2',3,3',4,5-PeCB (PCB-122)	76842-07-4	1.15	NDEP 2017	0.000020	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2',3,4,4',5-PeCB (PCB-123)	65510-44-3	0.589	NDEP 2017	0.000002	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2',3,4,5,5'-PeCB (PCB-124)	70424-70-3	1.15	NDEP 2017	0.000040	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2',3,4,5,6'-PeCB (PCB-125)	74472-39-2	1.15	NDEP 2017	0.000120	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
3,3',4,4',5-PeCB (PCB-126)	57465-28-8	0.000177	NDEP 2017	0.000002	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
3,3',4,5,5'-PeCB (PCB-127)	39635-33-1	1.15	NDEP 2017	0.000020	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,2',3,3',4,4'-HxCB (PCB-128)	38380-07-3	1.15	NDEP 2017	0.000040	EDL(3)	-- --	50	50 - 150	50	50 - 150	50

TABLE 3. SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[2] Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
2,2',3,3',4,5-HxCB (PCB-129)	55215-18-4	1.15	NDEP 2017	0.000060	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,3',4,5'-HxCB (PCB-130)	52663-66-8	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,3',4,6-HxCB (PCB-131)	61798-70-7	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,3',4,6'-HxCB (PCB-132)	38380-05-1	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,3',5,5'-HxCB (PCB-133)	35694-04-3	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,3',5,6-HxCB (PCB-134)	52704-70-8	1.15	NDEP 2017	0.000040	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,3',5,6'-HxCB (PCB-135)	52744-13-5	1.15	NDEP 2017	0.000040	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,3',6,6'-HxCB (PCB-136)	38411-22-2	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,4,4',5-HxCB (PCB-137)	35694-06-5	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,4,4',5'-HxCB (PCB-138)	35065-28-2	1.15	NDEP 2017	0.000060	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,4,4',6-HxCB (PCB-139)	56030-56-9	1.15	NDEP 2017	0.000040	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,4,4',6'-HxCB (PCB-140)	59291-64-4	1.15	NDEP 2017	0.000040	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,4,5,5'-HxCB (PCB-141)	52712-04-6	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,4,5,6-HxCB (PCB-142)	41411-61-4	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,4,5,6'-HxCB (PCB-143)	68194-15-0	1.15	NDEP 2017	0.000040	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,4,5',6-HxCB (PCB-144)	68194-14-9	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,4,6,6'-HxCB (PCB-145)	74472-40-5	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,4',5,5'-HxCB (PCB-146)	51908-16-8	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50

TABLE 3. SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[2]					
						Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
2,2',3,4',5,6-HxCB (PCB-147)	68194-13-8	1.15	NDEP 2017	0.000040	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,4',5,6'-HxCB (PCB-148)	74472-41-6	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,4',5',6-HxCB (PCB-149)	38380-04-0	1.15	NDEP 2017	0.000040	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,4',6,6'-HxCB (PCB-150)	68194-08-1	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,5,5',6-HxCB (PCB-151)	52663-63-5	1.15	NDEP 2017	0.000040	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',3,5,6,6'-HxCB (PCB-152)	68194-09-2	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',4,4',5,5'-HxCB (PCB-153)	35065-27-1	1.15	NDEP 2017	0.000040	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',4,4',5',6-HxCB (PCB-154)	60145-22-4	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,2',4,4',6,6'-HxCB (PCB-155)	33979-03-2	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,3',4,4',5-HxCB (PCB-156)	38380-08-4	0.589	NDEP 2017	0.000004	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,3',4,4',5'-HxCB (PCB-157)	69782-90-7	0.589	NDEP 2017	0.000004	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,3',4,4',6-HxCB (PCB-158)	74472-42-7	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,3',4,5,5'-HxCB (PCB-159)	39635-35-3	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,3',4,5,6-HxCB (PCB-160)	41411-62-5	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,3',4,5',6-HxCB (PCB-161)	74472-43-8	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,3',4',5,5'-HxCB (PCB-162)	39635-34-2	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,3',4',5,6-HxCB (PCB-163)	74472-44-9	1.15	NDEP 2017	0.000060	EDL[3]	-- --	50	50 - 150	50	50 - 150	50
2,3,3',4',5',6-HxCB (PCB-164)	74472-45-0	1.15	NDEP 2017	0.000020	EDL[3]	-- --	50	50 - 150	50	50 - 150	50

TABLE 3. SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source(1)	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS(2) Surrogate %R		Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike/LCS %R	Blank Spike/LCS RPD
2,3,3',5,5',6-HxCB (PCB-165)	74472-46-1	1.15	NDEP 2017	0.000020	EDL(3)	--	--	50	50 - 150	50	50 - 150	50
2,3,4,4',5,6-HxCB (PCB-166)	41411-63-6	1.15	NDEP 2017	0.000040	EDL(3)	--	--	50	50 - 150	50	50 - 150	50
2,3',4,4',5,5'-HxCB (PCB-167)	52663-72-6	0.589	NDEP 2017	0.000002	EDL(3)	--	--	50	50 - 150	50	50 - 150	50
2,3',4,4',5',6-HxCB (PCB-168)	59291-65-5	1.15	NDEP 2017	0.000040	EDL(3)	--	--	50	50 - 150	50	50 - 150	50
3,3',4,4',5,5'-HxCB (PCB-169)	32774-16-6	0.000589	NDEP 2017	0.000002	EDL(3)	--	--	50	50 - 150	50	50 - 150	50
2,2',3,3',4,4',5-HpCB (PCB-170)	35065-30-6	1.15	NDEP 2017	0.000020	EDL(3)	--	--	50	50 - 150	50	50 - 150	50
2,2'3,3',4,4',6-HpCB (PCB-171)	52663-71-5	1.15	NDEP 2017	0.000040	EDL(3)	--	--	50	50 - 150	50	50 - 150	50
2,2',3,3',4,5,5'-HpCB (PCB-172)	52663-74-8	1.15	NDEP 2017	0.000020	EDL(3)	--	--	50	50 - 150	50	50 - 150	50
2,2',3,3',4,5,6-HpCB (PCB-173)	68194-16-1	1.15	NDEP 2017	0.000040	EDL(3)	--	--	50	50 - 150	50	50 - 150	50
2,2',3,3',4,5,6'-HpCB (PCB-174)	38411-25-5	1.15	NDEP 2017	0.000020	EDL(3)	--	--	50	50 - 150	50	50 - 150	50
2,2',3,3',4,5',6-HpCB (PCB-175)	40186-70-7	1.15	NDEP 2017	0.000020	EDL(3)	--	--	50	50 - 150	50	50 - 150	50
2,2',3,3',4,6,6'-HpCB (PCB-176)	52663-65-7	1.15	NDEP 2017	0.000020	EDL(3)	--	--	50	50 - 150	50	50 - 150	50
2,2',3,3',4',5,6-HpCB (PCB-177)	52663-70-4	1.15	NDEP 2017	0.000020	EDL(3)	--	--	50	50 - 150	50	50 - 150	50
2,2',3,3',5,5',6-HpCB (PCB-178)	52663-67-9	1.15	NDEP 2017	0.000020	EDL(3)	--	--	50	50 - 150	50	50 - 150	50
2,2',3,3',5,6,6'-HpCB (PCB-179)	52663-64-6	1.15	NDEP 2017	0.000020	EDL(3)	--	--	50	50 - 150	50	50 - 150	50
2,2',3,4,4',5,5'-HpCB (PCB-180)	35065-29-3	1.15	NDEP 2017	0.000040	EDL(3)	--	--	50	50 - 150	50	50 - 150	50
2,2',3,4,4',5,6-HpCB (PCB-181)	74472-47-2	1.15	NDEP 2017	0.000020	EDL(3)	--	--	50	50 - 150	50	50 - 150	50
2,2',3,4,4',5,6'-HpCB (PCB-182)	60145-23-5	1.15	NDEP 2017	0.000020	EDL(3)	--	--	50	50 - 150	50	50 - 150	50

TABLE 3. SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[(1)]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[(2)] Surrogate %R		Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike/LCS %R	Blank Spike/LCS RPD
2,2',3,4,4',5',6-HpCB (PCB-183)	52663-69-1	1.15	NDEP 2017	0.000020	EDL[(3)]	--	--	50	50 - 150	50	50 - 150	50
2,2',3,4,4',6,6'-HpCB (PCB-184)	74472-48-3	1.15	NDEP 2017	0.000020	EDL[(3)]	--	--	50	50 - 150	50	50 - 150	50
2,2',3,4,5,5',6-HpCB (PCB-185)	52712-05-7	1.15	NDEP 2017	0.000020	EDL[(3)]	--	--	50	50 - 150	50	50 - 150	50
2,2',3,4,5,6,6'-HpCB (PCB-186)	74472-49-4	1.15	NDEP 2017	0.000020	EDL[(3)]	--	--	50	50 - 150	50	50 - 150	50
2,2',3,4',5,5',6-HpCB (PCB-187)	52663-68-0	1.15	NDEP 2017	0.000020	EDL[(3)]	--	--	50	50 - 150	50	50 - 150	50
2,2',3,4',5,6,6'-HpCB (PCB-188)	74487-85-7	1.15	NDEP 2017	0.000020	EDL[(3)]	--	--	50	50 - 150	50	50 - 150	50
2,3,3',4,4',5,5'-HpCB (PCB-189)	39635-31-9	0.589	NDEP 2017	0.000002	EDL[(3)]	--	--	50	50 - 150	50	50 - 150	50
2,3,3',4,4',5,6-HpCB (PCB-190)	41411-64-7	1.15	NDEP 2017	0.000020	EDL[(3)]	--	--	50	50 - 150	50	50 - 150	50
2,3,3',4,4',5',6-HpCB (PCB-191)	74472-50-7	1.15	NDEP 2017	0.000020	EDL[(3)]	--	--	50	50 - 150	50	50 - 150	50
2,3,3',4,5,5',6-HpCB (PCB-192)	74472-51-8	1.15	NDEP 2017	0.000020	EDL[(3)]	--	--	50	50 - 150	50	50 - 150	50
2,3,3',4',5,5',6-HpCB (PCB-193)	69782-91-8	1.15	NDEP 2017	0.000040	EDL[(3)]	--	--	50	50 - 150	50	50 - 150	50
2,2',3,3',4,4',5,5'-OcCB (PCB-194)	35694-08-7	1.15	NDEP 2017	0.000020	EDL[(3)]	--	--	50	50 - 150	50	50 - 150	50
2,2',3,3',4,4',5,6-OcCB (PCB-195)	52663-78-2	1.15	NDEP 2017	0.000020	EDL[(3)]	--	--	50	50 - 150	50	50 - 150	50
2,2',3,3',4,4',5,6'-OcCB (PCB-196)	42740-50-1	1.15	NDEP 2017	0.000020	EDL[(3)]	--	--	50	50 - 150	50	50 - 150	50
2,2',3,3',4,4',6,6'-OcCB (PCB-197)	33091-17-7	1.15	NDEP 2017	0.000020	EDL[(3)]	--	--	50	50 - 150	50	50 - 150	50
2,2',3,3',4,5,5',6-OcCB (PCB-198)	68194-17-2	1.15	NDEP 2017	0.000040	EDL[(3)]	--	--	50	50 - 150	50	50 - 150	50
2,2',3,3',4,5,5',6'-OcCB (PCB-199)	52663-75-9	1.15	NDEP 2017	0.000040	EDL[(3)]	--	--	50	50 - 150	50	50 - 150	50
2,2',3,3',4,5,6,6'-OcCB (PCB-200)	52663-73-7	1.15	NDEP 2017	0.000020	EDL[(3)]	--	--	50	50 - 150	50	50 - 150	50

TABLE 3. SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source(1)	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS(2) Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
2,2',3,3',4,5',6,6'-OcCB (PCB-201)	40186-71-8	1.15	NDEP 2017	0.000020	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,2',3,3',5,5',6,6'-OcCB (PCB-202)	2136-99-4	1.15	NDEP 2017	0.000020	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,2',3,4,4',5,5',6-OcCB (PCB-203)	52663-76-0	1.15	NDEP 2017	0.000020	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,2',3,4,4',5,6,6'-OcCB (PCB-204)	74472-52-9	1.15	NDEP 2017	0.000020	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,3,3',4,4',5,5',6-OcCB (PCB-205)	74472-53-0	1.15	NDEP 2017	0.000020	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,2',3,3',4,4',5,5',6-NoCB (PCB-206)	40186-72-9	1.15	NDEP 2017	0.000020	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,2',3,3',4,4',5,6,6'-NoCB (PCB-207)	52663-79-3	1.15	NDEP 2017	0.000020	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
2,2',3,3',4,5,5',6,6'-NoCB (PCB-208)	52663-77-1	1.15	NDEP 2017	0.000020	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
DeCB (PCB-209)	2051-24-3	1.15	NDEP 2017	0.00002	EDL(3)	-- --	50	50 - 150	50	50 - 150	50
PCBs as Aroclors (mg/kg)											
EPA Method SW8082											
Aroclor 1260	11096-82-5	1.15	NDEP 2017	0.05	0.017	-- --	50	50 - 125	30	65 - 115	30
DCB Decachlorobiphenyl (Surr)	2051-24-3	--	--	--	--	45 - 120	--	-- --	--	-- --	--
Organic Acids (mg/kg)											
EPA Method SW8270C											
Phthalic acid	88-99-3	--	--	2.5	0.76	-- --	50	-- --	--	-- --	--
2-fluorobiphenyl (Surr)	321-60-8			--	--	29 - 120	--	-- --	--	-- --	--

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QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[2] Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike/LCS %R	Blank Spike/LCS RPD
Total Petroleum Hydrocarbons (mg/kg)											
EPA Method SW8015B											
Gasoline Range Organics (C6-C10)	TPH-gasoline	100	ENVIRON 2012[6]	0.40	0.15	-- --	50	60 - 140	30	70 - 135	20
4-Bromofluorobenzene (Surr)	460-00-4	--	--	--	--	65 - 140	--	-- --	--	-- --	--
Diesel Range Organics (C10-C28)	TPH-diesel	100	ENVIRON 2012[6]	5	2.5	-- --	50	40 - 120	30	45 - 115	25
Oil Range Organics (C29-C40)	TPH-oil	100	ENVIRON 2012[6]	5	2.5	-- --	50	40 - 120	30	45 - 115	25
n-Octacosane (Surr)	630-02-4	--	--	--	--	40 - 140	--	-- --	--	-- --	--
Wet Chemistry and Miscellaneous Analytes (mg/kg except as noted)											
SM 2320B											
Alkalinity as $CaCO_3$	ALK_TOT_CACO3	--	--	500	--	-- --	50	-- --	--	80 - 120	20
Bicarbonate as HCO_3^-	BICARBHCO3	--	--	610	--	-- --	50	-- --	--	-- --	--
Carbonate	3812-32-6	--	--	300	--	-- --	50	-- --	--	-- --	--
Hydroxide	14280-30-9	--	--	170	--	-- --	50	-- --	--	-- --	--
SM 4500-NH_3 D											
Ammonia as NH_3	7664-41-7	6,140	NDEP 2017	12	2.4	-- --	50	75 - 125	15	85 - 115	15
EPA Method 9056A											
Bromide	24959-67-9	100,000	NDEP 2017	5.0	3.5	-- --	50	80 - 120	20	90 - 110	20
Chloride	16887-00-6	--	--	5.0	4.0	-- --	50	80 - 120	20	90 - 110	20
Fluoride	16984-48-8	51,900	NDEP 2017	5.0	3.5	-- --	50	80 - 120	20	90 - 110	20
Nitrate as N	14797-55-8	100,000	NDEP 2017	1.1	0.8	-- --	50	80 - 120	20	90 - 110	20
Nitrite as N	14797-65-0	100,000	NDEP 2017	1.5	1.1	-- --	50	80 - 120	20	90 - 110	20
Orthophosphate as P	7723-14-OP	--	--	5.0	4.0	-- --	50	80 - 120	20	90 - 110	20
Sulfate	14808-79-8	--	--	5.0	4.0	-- --	50	80 - 120	20	90 - 110	20
EPA Method 300.1											
Chlorate	7790-93-4	38,900	NDEP 2017	0.2	0.05	-- --	50	75 - 125	25	75 - 125	25
Dichloroacetic acid (Surr)	79-43-6	--	--	--	--	90 - 115	--	-- --	--	-- --	--

TABLE 3. SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[2] Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
EPA Method 314.0											
Perchlorate	14797-73-0	908	NDEP 2017	0.01	0.0095	-- --	50	80 - 120	20	85 - 115	15
EPA Method SW6860											
Perchlorate	14797-73-0	908	NDEP 2017	0.0005	0.0001	-- --	50	70 - 130	15	70 - 130	15
EPA Method SW9014											
Cyanide	57-12-5	179	NDEP 2017	0.5	0.43	-- --	50	70 - 115	15	90 - 110	10
EPA Method SW2510B											
Specific Conductance	--	--	--	10.0	--	-- --	50	-- --	--	90 - 110	20
EPA Method SW9045D											
pH	--	--	--	0.1	--	-- --	50	-- --	--	-- --	--
SM 5540C											
Surfactants (MBAS)	--	--	--	1	0.5	-- --	50	50 125	20	90 - 110	20
SM 5310B											
Total Organic Carbon	7440-44-0	--	--	300	100	-- --	50	47 - 143	20	47 - 143	20
Radionuclides (pCi/g)[8]											
See Table 1 for Individual Methods											
Radium-226	13982-63-3	0.023	NDEP 2017	1	--	-- --	50	72 - 140	40	65 - 140	0
Radium-228	15262-20-1	0.041	NDEP 2017	1	--	-- --	50	30 - 150	40	61 - 139	0
Thorium-228	14274-82-9	0.025	NDEP 2017	1	--	-- --	50	70 - 130	40	70 - 130	0
Thorium-230	14269-63-7	8.3	NDEP 2017	1	--	-- --	50	76 - 115	40	81 - 118	0
Thorium-232	7440-29-1	7.4	NDEP 2017	1	--	-- --	50	70 - 130	40	70 - 130	0
Uranium-234	13966-29-5	11	NDEP 2017	1	--	-- --	50	70 - 130	40	84 - 120	0
Uranium-235	15117-96-1	0.35	NDEP 2017	1	--	-- --	50	-- --	40	-- --	0
Uranium-238	7440-61-1	1.4	NDEP 2017	1	--	-- --	50	70 - 130	40	82 - 122	0

TABLE 3. SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source(1)	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS(2)					
						Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
Asbestos (protocol structures)											
EPA Method 540-R-97-028 modified per Berman & Kolk (2000)											
Total Amphibole Protocol Structures	1332-21-4	--	--	Fiber Count(9)		-- --	50	-- --	--	-- --	--
Long Amphibole Protocol Structures	1332-21-4	1 or more	NDEP 2010	Fiber Count(9)		-- --	50	-- --	--	-- --	--
Total Chrysotile Protocol Structures	1332-21-4	--	--	Fiber Count(9)		-- --	50	-- --	--	-- --	--
Long Chrysotile Protocol Structures	1332-21-4	More than 5	NDEP 2010	Fiber Count(9)		-- --	50	-- --	--	-- --	--
Total Asbestos Protocol Structures	1332-21-4	--	--	Fiber Count(9)		-- --	50	-- --	--	-- --	--
Long Asbestos Protocol Structures	1332-21-4	--	--	Fiber Count(9)		-- --	50	-- --	--	-- --	--

Notes:

Shaded PQLs and MDLs exceed the lowest screening criteria.

-- = no value

mg/kg = milligrams per kilogram

pCi/g = picoCuries per gram

pg/g = picograms per gram

protocol structure = asbestos protocol structures greater than 10 micrometers (µm) in length and less than 0.4 µm in width that is most responsible for asbestos related disease (NDEP 2011).

Surr = Surrogate

TEQ = toxicity equivalence

EPA = United States Environmental Protection Agency

SM = Standard Method

(1) Screening values obtained from (a) NDEP (2017) and are the lower of the indoor and outdoor industrial/commercial worker soil Basic Comparison Levels (BCLs); and (b) NDEP (2010) and are site-specific levels for indoor and outdoor industrial/commercial workers or based on regional background concentrations.

(2) QC Limits = Quality Control Limits for %R (Percent Recovery) of spiked compounds in Laboratory Control Samples (LCS) and surrogate compounds and Relative Percent Difference (RPD) between Matrix Spike (MS) and MS Duplicate (MSD) samples and LCS and LCS duplicate (LCSD) samples. Laboratory historical control limits are subject to change as a result of periodic re-evaluation. Limits in use at the time of sample analysis are available from the laboratory. Duplicate RPDs apply to sample duplicates and field duplicates.

TABLE 3. SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

Notes:

(3) EDL = Estimated Detection Limit. For each dioxin, furan, or PCB not detected, an EDL is calculated. The sample specific EDL is an estimate made by the laboratory of the concentration of a given chemical that would have to be present to produce a signal with a peak height of at least 2.5 times the background signal level. The estimate is specific to a particular analysis of the sample and will be affected by sample size, dilution, and so forth. Because of the toxicological significance of dioxins, the EDL value is reported for non-detected chemicals rather than reporting the MDL.

(4) Dioxins and PCB congeners shall be reported to the estimated detection limit (EDL). Dioxin toxicity equivalents (TEQ) will be calculated for the 16 dioxin and furan congeners and 12 PCB congeners with toxicity equivalent factors (TEFs) defined by the World Health Organization (Van den Berg et al. 2006) substituting half of the EDL for the congeners not detected.

(5) The screening level for m-xylene is used for m,p-xylene.

(6) A total TPH value of 100 mg/kg was used in the Interim Soil Removal Actions Report (ENVIRON 2012) and the Site Management Plan, Revision 1 (SMP) (2013).

(7) EPA Method 8280 may be used to analyze dioxin samples with concentrations that are too high to be accurately measured by EPA Method 8290.
An initial screening will be performed by the laboratory to determine which dioxin analysis method should be used.

(8) Radionuclide PQLs and MDLs are based on minimum detectable activity (MDA) values. The measured values are reported regardless of sample-specific MDA.

(9) Asbestos data will be reported as raw asbestos fiber counts per sample (NDEP 2008). There are no PQLs for this method, but sensitivity is calculated by the concentration of protocol structures per volume of PM10.

Sources:

ENVIRON. 2012. Interim Soil Removal Action , Nevada Environmental Response Trust Site, Henderson, Nevada, August 2010-November 2011. Revised September 2012. NDEP approved December 17, 2012.

ENVIRON. 2013. Site Management Plan, Revision 1, Nevada Environmental Response Trust Site, Henderson, Nevada. October 31.

NDEP. 2008. NDEP. 2008. NDEP Detection Limits and Data Reporting for the BMI Plant Sites and Common Areas Projects, Henderson, Nevada. December.

NDEP. 2010. Letter to Tronox LLC re: Response to: Results of Bioaccessibility Study for Dioxin/Furans in Soil, Tronox LLC, Henderson, Nevada (Revised), Dated May 24, 2010. May 25, 2010.

NDEP. 2015. Technical Guidance for the Calculation of Asbestos Related Risk in Soils for the Basic Management Incorporated (BMI) Complex and Common Areas. February.

NDEP. 2017. User’s Guide and Background Technical Document for NDEP Basic Comparison Levels (BCLs) for Human Health for the BMI Complex and Common Areas. Revision 14, July.

Van den Berg et al., 2006. The 2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds. May 20.

TABLE 4. SOIL GAS ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[2]			
						Surrogate	Duplicate	Blank Spike/LCS	
						%R	RPD	%R	RPD
Soil Gas Analytes (µg/m³)									
EPA Method TO-15									
1,1,1,2-Tetrachloroethane	630-20-6	7.69E+03	ENVIRON 2013	3.43	--	-- --	50	70 - 130	25
1,2,3-Trichloropropane	96-18-4	--	ENVIRON 2013	3.01	--	-- --	50	70 - 130	25
1,2,4-Trichlorobenzene	120-82-1	8.39E+04	ENVIRON 2013	3.70	--	-- --	50	70 - 130	25
1,2,4-Trimethylbenzene	95-63-6	1.61E+05	ENVIRON 2013	0.49	0.108	-- --	50	70 - 130	25
1,2-Dibromo-3-chloropropane	96-12-8	1.83E+01	ENVIRON 2013	4.83	--	-- --	50	70 - 130	25
1,2-Dichlorobenzene	95-50-1	4.16E+06	ENVIRON 2013	0.60	0.108	-- --	50	70 - 130	25
1,2-Dichloropropane	78-87-5	5.28E+03	ENVIRON 2013	0.46	0.111	-- --	50	70 - 130	25
1,3,5-Trimethylbenzene	108-67-8	1.62E+05	ENVIRON 2013	0.49	0.098	-- --	50	70 - 130	25
1,3-Dichlorobenzene	541-73-1	4.15E+06	ENVIRON 2013	0.60	0.204	-- --	50	70 - 130	25
1,4-Dioxane	123-91-1	5.49E+03	ENVIRON 2013	0.36	0.191	-- --	50	70 - 130	25
2-Butanone (MEK)	78-93-3	9.02E+07	ENVIRON 2013	1.50	0.301	-- --	50	70 - 130	25
2-Hexanone	591-78-6	5.24E+05	ENVIRON 2013	2.00	0.52	-- --	50	70 - 130	25
4-Ethyltoluene	622-96-8	8.72E+06	ENVIRON 2013	0.49	0.113	-- --	50	70 - 130	25
4-Methyl-2-pentanone (MIBK)	108-10-1	5.80E+07	ENVIRON 2013	0.41	0.102	-- --	50	70 - 130	25
Acetone	67-64-1	4.12E+08	ENVIRON 2013	2.38	0.399	-- --	50	70 - 130	25
Acrylonitrile	107-13-1	5.59E+02	ENVIRON 2013	1.09	--	-- --	50	70 - 130	25
Benzyl chloride	100-44-7	1.27E+03	ENVIRON 2013	0.52	0.104	-- --	50	70 - 130	25
Bromodichloromethane	75-27-4	3.19E+03	ENVIRON 2013	0.67	0.241	-- --	50	70 - 130	25
Bromoform	75-25-2	2.01E+05	ENVIRON 2013	1.00	0.238	-- --	50	70 - 130	25
Carbon Disulfide	75-15-0	1.07E+07	ENVIRON 2013	1.60	0.268	-- --	50	70 - 130	25
Chlorobenzene	108-90-7	9.95E+05	ENVIRON 2013	0.46	0.12	-- --	50	70 - 130	25
Cyclohexane	110-82-7	1.11E+08	ENVIRON 2013	0.34	0.093	-- --	50	70 - 130	25
Dibromochloromethane	124-48-1	6.38E+03	ENVIRON 2013	0.85	0.256	-- --	50	70 - 130	25
Ethanol	64-17-5	8.34E+08	ENVIRON 2013	0.94	0.196	-- --	50	70 - 130	25
Ethyl Acetate	141-78-6	1.27E+07	ENVIRON 2013	1.80	--	-- --	50	70 - 130	25

TABLE 4. SOIL GAS ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[2] Surrogate %R	Duplicate RPD	Blank Spike/LCS %R	Blank Spike/LCS RPD
Soil Gas Analytes (µg/m³)									
Trichlorofluoromethane (Freon 11)	75-69-4	1.22E+07	ENVIRON 2013	0.56	0.118	-- --	50	70 - 130	25
1,1,2-Trichloro trifluoroethane (Freon 113)	76-13-1	5.67E+08	ENVIRON 2013	0.77	0.153	-- --	50	70 - 130	25
Heptane	142-82-5	7.06E+07	ENVIRON 2013	0.41	0.139	-- --	50	70 - 130	25
Hexachlorobutadiene	87-68-3	3.12E+03	ENVIRON 2013	5.30	1.813	-- --	50	70 - 130	25
Hexane	110-54-3	7.06E+06	ENVIRON 2013	1.76	0.197	-- --	50	70 - 130	25
Methyl Methacrylate	80-62-6	1.33E+07	ENVIRON 2013	2.05	--	-- --	50	70 - 130	25
Methylene Chloride	75-09-2	4.37E+06	ENVIRON 2013	0.69	0.101	-- --	50	70 - 130	25
Styrene	100-42-5	2.03E+07	ENVIRON 2013	0.42	0.047	-- --	50	70 - 130	25
Tetrahydrofuran	109-99-9	3.64E+07	ENVIRON 2013	1.50	0.587	-- --	50	70 - 130	25
Vinyl Acetate	108-05-4	3.54E+06	ENVIRON 2013	1.76	0.834	-- --	50	70 - 130	25
EPA Method TO-15 SIM									
1,1,2,2-Tetrachloroethane	79-34-5	9.78E+02	ENVIRON 2013	0.14	0.048	-- --	50	70 - 130	25
1,1,2-Trichloroethane	79-00-5	3.30E+03	ENVIRON 2013	0.11	0.033	-- --	50	70 - 130	25
1,1-Dichloroethane	75-34-3	3.44E+04	ENVIRON 2013	0.08	0.028	-- --	50	70 - 130	25
1,1-Dichloroethene	75-35-4	3.40E+06	ENVIRON 2013	0.04	0.032	-- --	50	70 - 130	25
1,2-Dibromoethane (EDB)	106-93-4	2.61E+02	ENVIRON 2013	0.15	0.023	-- --	50	70 - 130	25
1,2-Dichloroethane	107-06-2	1.65E+03	ENVIRON 2013	0.08	0.016	-- --	50	70 - 130	25
1,4-Dichlorobenzene	106-46-7	5.29E+03	ENVIRON 2013	0.12	0.066	-- --	50	70 - 130	25
Benzene	71-43-2	6.20E+03	ENVIRON 2013	0.16	0.093	-- --	50	70 - 130	25
Carbon Tetrachloride	56-23-5	8.82E+03	ENVIRON 2013	0.12	0.057	-- --	50	70 - 130	25
Chloroethane	75-00-3	8.61E+07	ENVIRON 2013	0.13	0.018	-- --	50	70 - 130	25
Chloroform	67-66-3	1.86E+03	ENVIRON 2013	0.10	0.029	-- --	50	70 - 130	25
Chloromethane	74-87-3	2.08E+04	ENVIRON 2013	1.03	0.025	-- --	50	70 - 130	25
cis-1,2-Dichloroethene	156-59-2	1.19E+06	ENVIRON 2013	0.08	0.028	-- --	50	70 - 130	25
Ethylbenzene	100-41-4	2.18E+04	ENVIRON 2013	0.09	0.056	-- --	50	70 - 130	25

TABLE 4. SOIL GAS ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[2]			
						Surrogate	Duplicate	Blank Spike/LCS	
						%R	RPD	%R	RPD
Soil Gas Analytes ($\mu g/m^3$)									
Dichlorodifluoromethane (Freon 12)	75-71-8	2.14E+06	ENVIRON 2013	0.10	0.025	-- --	50	70 - 130	25
m,p-Xylene	108-38-3	--	ENVIRON 2013	0.17	0.1	-- --	50	70 - 130	25
Naphthalene	91-20-3	1.93E+03	ENVIRON 2013	0.26	0.042	-- --	50	70 - 130	25
o-Xylene	95-47-6	--	ENVIRON 2013	0.09	0.017	-- --	50	70 - 130	25
Tetrachloroethene	127-18-4	2.17E+05	ENVIRON 2013	0.14	0.027	-- --	50	70 - 130	25
Toluene	108-88-3	8.70E+07	ENVIRON 2013	0.19	0.057	-- --	50	70 - 130	25
trans-1,2-Dichloroethene	156-60-5	1.22E+06	ENVIRON 2013	0.40	0.032	-- --	50	70 - 130	25
Trichloroethene	79-01-6	1.28E+04	ENVIRON 2013	0.11	0.075	-- --	50	70 - 130	25
Vinyl Chloride	75-01-4	9.60E+03	ENVIRON 2013	0.03	0.02	-- --	50	70 - 130	25

Notes:

-- = no value

$\mu g/m^3$ = micrograms per cubic meter

Surr = Surrogate

(1) ENVIRON derived risk-based concentrations (RBCs) using the inputs to the Johnson and Ettinger model and values for exposure assumptions and toxicity criteria presented in the NDEP-approved Soil Gas Investigation and Human Health Risk Assessment Work Plan for Parcels C, D, F, G, and H (ENVIRON 2013).

(2) QC Limits = Quality Control Limits for %R (Percent Recovery) of spiked compounds in Laboratory Control Samples (LCS) and surrogate compounds and Relative Percent Difference (RPD) between LCS and LCS Duplicate (LCSD) samples. Matrix spikes (MS) are not performed on soil gas samples. Laboratory historical control limits are subject to change as a result of periodic re-evaluation. Limits in use at the time of sample analysis are available from the laboratory. Duplicate RPDs apply to sample duplicates and field duplicates.

Sources:

ENVIRON. 2013. Soil Gas Investigation and Human Health Risk Assessment Work Plan for Parcels C, D, F, G, and H. Nevada Environmental Response Trust, Henderson, Nevada. March 18, 2013. Approved by NDEP April 9, 2013.

TABLE 5. LEACHING-BASED SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[2] Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
Metals (mg/kg)											
EPA Method SW6010B, SW6010C											
Aluminum	7429-90-5	75	BCL	10	7.7	-- --	50	75 - 125	20	80 - 120	20
Barium	7440-39-3	82	BCL	1.5	0.75	-- --	50	75 - 125	20	80 - 120	20
Beryllium	7440-41-7	3	BCL	0.50	0.25	-- --	50	75 - 125	20	80 - 120	20
Boron	7440-42-8	21.4	BCL	5	2.5	-- --	50	75 - 125	20	80 - 120	20
Cadmium	7440-43-9	0.40	BCL	0.5	0.25	-- --	50	75 - 125	20	80 - 120	20
Calcium	7440-70-2	--	--	25	13.5	-- --	50	75 - 125	20	80 - 120	20
Chromium (total)	7440-47-3	180,000	CAL	1	0.5	-- --	50	75 - 125	20	80 - 120	20
Cobalt	7440-48-4	0.453	BCL	1	0.5	-- --	50	75 - 125	20	80 - 120	20
Copper	7440-50-8	45.8	BCL	2	1.1	-- --	50	75 - 125	20	80 - 120	20
Iron	7439-89-6	7.56	BCL	10	6.9	-- --	50	75 - 125	20	80 - 120	20
Lead	7439-92-1	14	CAL	2	1	-- --	50	75 - 125	20	80 - 120	20
Magnesium	7439-95-4	889	BCL	10	5	-- --	50	75 - 125	20	80 - 120	20
Manganese	7439-96-5	3.26	BCL	2	1	-- --	50	75 - 125	20	80 - 120	20
Molybdenum	7439-98-7	3.37	BCL	2	1	-- --	50	75 - 125	20	80 - 120	20
Nickel	7440-02-0	7.0	BCL	2	1	-- --	50	75 - 125	20	80 - 120	20
Phosphorus	7723-14-0	6100	CAL	5	2.5	-- --	50	75 - 125	20	80 - 120	20
Potassium	7440-09-7	--	--	62.5	32.5	-- --	50	75 - 125	20	80 - 120	20
Silicon	7440-21-3	--	--	10	5	-- --	50	75 - 125	20	80 - 120	20
Silver	7440-22-4	0.85	BCL	1.5	0.89	-- --	50	75 - 125	20	80 - 120	20
Sodium	7440-23-5	--	--	62.5	32	-- --	50	75 - 125	20	80 - 120	20
Strontium	7440-24-6	700	CAL	5	2.5	-- --	50	75 - 125	20	80 - 120	20
Tin	7440-31-5	5,000	CAL	10	5	-- --	50	75 - 125	20	80 - 120	20
Titanium	7440-32-6	134,000	BCL	2	1	-- --	50	75 - 125	20	80 - 120	20
Tungsten	7440-33-7	4.01	BCL	10	2.5	-- --	50	75 - 125	20	80 - 120	20
Vanadium	7440-62-2	300	BCL	1	0.5	-- --	50	75 - 125	20	80 - 120	20
Zinc	7440-66-6	620	BCL	5	2.5	-- --	50	75 - 125	20	80 - 120	20
Zirconium[3]	7440-67-7	8.0	CAL	5	5	-- --	50	75 - 125	20	80 - 120	20

TABLE 5. LEACHING-BASED SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[2] Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
EPA Method SW6020											
Antimony	7440-36-0	0.30	BCL	10	5	-- --	50	75 - 125	20	80 - 120	20
Arsenic	7440-38-2	0.29	RSL	0.5	0.25	-- --	50	80 - 120	20	80 - 120	20
Niobium	7440-03-1	1.17	BCL	2.5	0.38	-- --	50	75 - 125	30	80 - 120	20
Palladium	7440-05-3	--	--	0.1	0.01	-- --	50	75 - 125	30	80 - 120	20
Selenium	7782-49-2	0.30	BCL	1	0.5	-- --	50	80 - 120	20	80 - 120	20
Sulfur	7704-34-9	--	--	500	21.7	-- --	50	75 - 125	30	80 - 120	20
Thallium	7440-28-0	0.40	BCL	10	5.0	-- --	50	80 - 120	20	80 - 120	20
Uranium	7440-61-1	13.5	BCL	0.1	0.0199	-- --	50	75 - 125	30	80 - 120	20
EPA Method SW7199											
Chromium (hexavalent)	18540-29-9	2.0	BCL	0.8	0.15	-- --	50	55 - 110	20	65 - 110	20
EPA Method SW7471A											
Mercury	7439-97-6	0.104	BCL	0.02	0.012	-- --	50	70 - 130	20	80 - 120	20
Volatile Organic Compounds (μg/kg)											
EPA Method SW8260B											
1,1,1,2-Tetrachloroethane	630-20-6	0.22	RSL	2000	1.0	-- --	50	65 - 145	20	70 - 130	20
1,1,1-Trichloroethane	71-55-6	100	BCL	1	0.5	-- --	50	65 - 145	20	65 - 135	20
1,1,2,2-Tetrachloroethane	79-34-5	0.2	BCL	2	1.0	-- --	50	40 - 160	30	55 - 140	30
1,1,2-Trichloroethane	79-00-5	0.9	BCL	1	0.5	-- --	50	65 - 140	30	65 - 135	20
1,1-Dichloroethane	75-34-3	1000	BCL	1	0.5	-- --	50	65 - 135	25	70 - 130	20
1,1-Dichloroethene	75-35-4	3	BCL	2	0.5	-- --	50	65 - 135	25	70 - 125	20
1,1-Dichloropropene	563-58-6	--	--	1	0.5	-- --	50	65 - 135	20	70 - 130	20
1,2,3-Trichlorobenzene	87-61-6	21	RSL	2	1	-- --	50	45 - 145	30	60 - 130	20
1,2,3-Trichloropropane	96-18-4	0.00032	RSL	10	1.0	-- --	50	50 - 150	30	60 - 135	25
1,2,4-Trichlorobenzene	120-82-1	300	BCL	5	1.0	-- --	50	50 - 140	30	70 - 135	20
1,2,4-Trimethylbenzene	95-63-6	81	RSL	2	1	-- --	50	65 - 140	25	70 - 125	20
1,2-Dibromo-3-Chloropropane	96-12-8	0.00014	RSL	5	2.0	-- --	50	40 - 150	30	50 - 135	30
1,2-Dibromoethane (EDB)	106-93-4	0.0021	RSL	1	0.5	-- --	50	65 - 140	25	70 - 130	20
1,2-Dichlorobenzene	95-50-1	900	BCL	1	0.5	-- --	50	70 - 130	25	75 - 120	20
1,2-Dichloroethane	107-06-2	1	BCL	1	0.5	-- --	50	60 - 150	25	60 - 140	20
1,2-Dichloropropane	78-87-5	1	BCL	1	0.5	-- --	50	65 - 130	20	70 - 130	20

TABLE 5. LEACHING-BASED SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[(1)]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[(2)] Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
1,3,5-Trimethylbenzene	108-67-8	87	RSL	2	1.0	-- --	50	65 - 135	25	70 - 125	20
1,3-Dichlorobenzene	541-73-1	50.8	CAL	1	0.5	-- --	50	70 - 130	25	75 - 125	20
1,3-Dichloropropane	142-28-9	1	BCL	1	0.5	-- --	50	65 - 140	25	70 - 125	20
1,4-Dichlorobenzene	106-46-7	100	BCL	1	0.5	-- --	50	70 - 130	25	75 - 120	20
2,2-Dichloropropane	594-20-7	--	--	2	1.0	-- --	50	65 - 150	25	60 - 145	20
2-Butanone	78-93-3	1200	RSL	10	5	-- --	50	25 - 170	40	40 - 145	35
2-Chlorotoluene	95-49-8	23	RSL	2	1.0	-- --	50	60 - 135	25	70 - 125	20
4-Chlorotoluene	106-43-4	24	RSL	2	1.0	-- --	50	65 - 135	25	75 - 125	20
Benzene	71-43-2	2	BCL	1	0.5	-- --	50	65 - 130	20	65 - 120	20
Bromobenzene	108-86-1	4.2	RSL	2	1.0	-- --	50	65 - 140	25	75 - 120	20
Bromochloromethane	74-97-5	21	RSL	2	1.0	-- --	50	65 - 145	25	70 - 135	20
Bromodichloromethane	75-27-4	30	BCL	1	0.5	-- --	50	65 - 145	20	70 - 135	20
Bromoform	75-25-2	40	BCL	2	1.0	-- --	50	50 - 145	30	55 - 135	25
Bromomethane	74-83-9	10	BCL	2	1.0	-- --	50	60 - 155	25	60 - 145	20
Carbon tetrachloride	56-23-5	3	BCL	2	0.5	-- --	50	60 - 145	25	65 - 140	20
Chlorobenzene	108-90-7	70	BCL	1	0.5	-- --	50	70 - 130	25	75 - 120	20
Chloroethane	75-00-3	5900	RSL	2	1.0	-- --	50	60 - 150	25	60 - 140	25
Chloroform	67-66-3	30	BCL	1	0.5	-- --	50	65 - 135	20	70 - 130	20
Chloromethane	74-87-3	49	RSL	2	1.0	-- --	50	40 - 145	25	45 - 145	25
cis-1,2-Dichloroethene	156-59-2	20	BCL	1	0.5	-- --	50	65 - 135	25	70 - 125	20
cis-1,3-Dichloropropene	10061-01-5	--	--	1	0.5	-- --	50	70 - 135	25	75 - 125	20
Dibromochloromethane	124-48-1	20.0	BCL	1	0.5	-- --	50	60 - 145	25	65 - 140	20
Dibromomethane	74-95-3	2.1	RSL	1	0.5	-- --	50	65 - 140	25	70 - 130	20
Dichlorodifluoromethane	75-71-8	300	RSL	2	1.0	-- --	50	30 - 160	35	35 - 160	30
Ethyl tert-butyl ether	637-92-3	--	--	2	1	-- --	50	60 - 145	30	60 - 140	20
Ethylbenzene	100-41-4	700	BCL	1	0.5	-- --	50	70 - 135	25	70 - 125	20
Hexachlorobutadiene	87-68-3	100	BCL	2	1.0	-- --	50	50 - 145	35	60 - 135	20
Isopropyl benzene	98-82-8	740	RSL	1	0.5	-- --	50	70 - 145	25	75 - 130	20
m,p-Xylene	179601-23-1	10	BCL	2	1.0	-- --	50	70 - 130	25	70 - 125	20
Methylene chloride	75-09-2	1	BCL	10	5	-- --	50	55 - 145	25	55 - 135	20
Naphthalene	91-20-3	4000	BCL	2	1.0	-- --	50	40 - 150	40	55 - 135	25

TABLE 5. LEACHING-BASED SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source(1)	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS(2)					
						Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
n-Butylbenzene	104-51-8	3200	RSL	2	1.0	-- --	50	55 - 145	30	70 - 130	20
n-Propylbenzene	103-65-1	1200	RSL	1	0.5	-- --	50	65 - 140	25	70 - 130	20
o-Xylene	95-47-6	9000	BCL	1	0.5	-- --	50	65 - 130	25	70 - 125	20
p-Isopropyltoluene	99-87-6	3910	CAL	1	0.5	-- --	50	60 - 140	25	75 - 125	20
sec-Butylbenzene	135-98-8	5900	RSL	2	1.0	-- --	50	60 - 135	25	70 - 125	20
Styrene	100-42-5	200	BCL	1	0.5	-- --	50	70 - 140	25	75 - 130	20
tert-Butylbenzene	98-06-6	1600	RSL	2	1.0	-- --	50	60 - 140	25	70 - 125	20
Tetrachloroethene	127-18-4	3	BCL	1	0.5	-- --	50	65 - 135	25	70 - 125	20
Toluene	108-88-3	600	BCL	1	0.5	-- --	50	70 - 130	20	70 - 125	20
trans-1,2-Dichloroethene	156-60-5	30	BCL	1	0.5	-- --	50	70 - 135	25	70 - 125	20
trans-1,3-Dichloropropene	10061-02-6	--	--	1	0.5	-- --	50	60 - 145	25	70 - 135	20
Trichloroethene	79-01-6	3.0	BCL	1	0.5	-- --	50	65 - 140	25	70 - 125	20
Trichlorofluoromethane	75-69-4	3300	RSL	2	1.0	-- --	50	55 - 155	25	60 - 145	25
Vinyl chloride	75-01-4	0.7	BCL	2	1.0	-- --	50	55 - 140	30	55 - 135	25
4-Bromofluorobenzene (Surr)	460-00-4	--	--	--	--	79 - 120	--	-- --	--	-- --	--
Dibromofluoromethane (Surr)	1868-53-7	--	--	--	--	60 - 120	--	-- --	--	-- --	--
Toluene-d8 (Surr)	2037-26-5	--	--	--	--	79 - 123	--	-- --	--	-- --	--
EPA Method SW8260B SIM											
1,2,3-Trichloropropane	96-18-4	1.8	RSL	0.01	0.004	-- --	50	50 - 150	30	60 - 135	25
1,4-Dioxane	123-91-1	0.094	RSL	5	1.1	-- --	50	70 - 130	30	70 - 130	30
Dibromofluoromethane (Surr)	1868-53-7	--	--	--	--	80 - 125	--	-- --	--	-- --	--
Semi-volatile Organic Compounds (mg/kg)											
EPA Method SW8270C, SW8270D											
1-Methylnaphthalene	90-12-0	0.036	CAL	0.250	0.110	-- --	50	60 - 140	30	60 - 140	30
2,4,5-Trichlorophenol	95-95-4	14	BCL	0.500	0.200	-- --	50	45 - 120	20	50 - 120	20
2,4,6-Trichlorophenol	88-06-2	0.008	BCL	0.500	0.160	-- --	50	45 - 120	25	50 - 120	20
2,4-Dichlorophenol	120-83-2	0.05	BCL	0.250	0.0500	-- --	50	45 - 120	25	45 - 120	20
2,4-Dimethylphenol	105-67-9	0.4	BCL	0.250	0.0980	-- --	50	30 - 120	25	40 - 120	20

TABLE 5. LEACHING-BASED SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[2]						
						Surrogate		Duplicate	Matrix Spike		Blank Spike/LCS	
						%R		RPD	%R	RPD	%R	RPD
2,4-Dinitrophenol	51-28-5	0.01	BCL	1.00	0.750	--	--	50	20 - 120	25	25 - 120	25
2,4-Dinitrotoluene	121-14-2	0.00004	BCL	0.250	0.0600	--	--	50	50 - 125	25	55 - 125	20
2,6-Dinitrotoluene	606-20-2	0.00003	BCL	0.250	0.0710	--	--	50	50 - 125	20	55 - 125	20
2-Chloronaphthalene	91-58-7	3.9	RSL	0.250	0.0500	--	--	50	45 - 120	20	45 - 120	20
2-Chlorophenol	95-57-8	0.2	BCL	0.250	0.0520	--	--	50	40 - 120	20	40 - 120	20
2-Methylnaphthalene	91-57-6	0.19	RSL	0.250	0.0520	--	--	50	40 - 120	20	45 - 120	20
2-Methylphenol	95-48-7	0.8	BCL	0.250	0.0600	--	--	50	40 - 120	25	40 - 120	20
2-Nitroaniline	88-74-4	0.08	RSL	0.250	0.170	--	--	50	45 - 120	25	50 - 125	20
2-Nitrophenol	88-75-5	--	--	0.250	0.100	--	--	50	40 - 120	25	45 - 120	20
3,3'-Dichlorobenzidine	91-94-1	0.0003	BCL	0.500	0.110	--	--	50	20 - 130	25	20 - 130	25
3-Methylphenol + 4-Methylphenol	106-44-5	--	--	0.250	0.100	--	--	50	50 - 120	25	50 - 120	20
3-Nitroaniline	99-09-2	--	--	0.250	0.100	--	--	50	30 - 120	25	35 - 120	25
4-Bromophenyl phenyl ether	101-55-3	--	--	0.250	0.0560	--	--	50	45 - 120	20	45 - 120	20
4-Chloro-3-methylphenol	59-50-7	1.7	RSL	0.400	0.150	--	--	50	50 - 125	25	50 - 125	20
4-Chloroaniline	106-47-8	0.03	BCL	0.500	0.150	--	--	50	20 - 120	30	20 - 120	30
4-Chlorophenyl phenyl ether	7005-72-3	--	--	0.500	0.200	--	--	50	50 - 120	25	55 - 120	20
4-Nitroaniline	100-01-6	0.0016	RSL	0.500	0.100	--	--	50	40 - 125	30	45 - 125	20
4-Nitrophenol	100-02-7	--	--	1.00	0.500	--	--	50	35 - 125	30	40 - 125	20
Acenaphthene	83-32-9	29	BCL	0.250	0.130	--	--	50	45 - 120	25	50 - 120	20
Acenaphthylene	208-96-8	0.01	CAL	0.250	0.0520	--	--	50	45 - 120	20	50 - 120	20
Aniline	62-53-3	0.001	RSL	0.500	0.140	--	--	50	25 - 120	30	25 - 120	20
Anthracene	120-12-7	590	BCL	0.250	0.0600	--	--	50	55 - 120	25	55 - 120	20
Benzidine	92-87-5	--	--	1.30	0.170	--	--	50	20 - 120	30	20 - 120	30
Benzo(a)anthracene	56-55-3	0.08	BCL	0.250	0.0520	--	--	50	50 - 120	25	55 - 120	20
Benzo(a)pyrene	50-32-8	0.4	BCL	0.250	0.0500	--	--	50	45 - 125	25	50 - 125	20
Benzo(b)fluoranthene	205-99-2	0.2	BCL	0.250	0.0520	--	--	50	45 - 125	30	45 - 125	25
Benzo(g,h,i)perylene	191-24-2	3900	CAL	0.250	0.0820	--	--	50	25 - 130	30	35 - 130	25
Benzo(k)fluoranthene	207-08-9	2	BCL	0.250	0.0520	--	--	50	45 - 125	30	45 - 125	25

TABLE 5. LEACHING-BASED SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[2] Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike/LCS %R	Blank Spike/LCS RPD
Benzoic acid	65-85-0	20	BCL	0.750	0.360	-- --	50	20 - 120	30	20 - 120	30
Benzyl alcohol	100-51-6	0.48	RSL	1.30	0.410	-- --	50	20 - 120	30	35 - 120	25
Bis(2-chloroethoxy)methane	111-91-1	0.013	RSL	0.250	0.100	-- --	50	45 - 120	25	45 - 120	20
Bis(2-chloroethyl)ether	111-44-4	0.00002	BCL	0.250	0.0520	-- --	50	35 - 110	25	35 - 120	25
Bis(2-ethylhexyl) phthalate	117-81-7	180	BCL	0.250	0.0680	-- --	50	45 - 130	25	50 - 130	20
Butyl benzyl phthalate	85-68-7	810	BCL	0.250	0.0600	-- --	50	45 - 125	25	50 - 125	20
Chrysene	218-01-9	8	BCL	0.250	0.0560	-- --	50	55 - 120	25	55 - 120	20
Dibenz(a,h)anthracene	53-70-3	0.08	BCL	0.250	0.0750	-- --	50	25 - 135	30	40 - 135	25
Dibenzofuran	132-64-9	0.15	RSL	0.250	0.140	-- --	50	50 - 120	25	55 - 120	20
Diethyl phthalate	84-66-2	6.1	RSL	0.250	0.0710	-- --	50	50 - 125	25	50 - 125	20
Dimethylphthalate	131-11-3	88	CAL	0.250	0.0500	-- --	50	45 - 125	25	50 - 125	20
Di-n-butyl phthalate	84-74-2	270	BCL	0.250	0.0680	-- --	50	50 - 125	25	50 - 125	20
Di-n-octyl phthalate	117-84-0	57	RSL	0.250	0.0680	-- --	50	50 - 135	25	50 - 135	20
Fluoranthene	206-44-0	210	BCL	0.330	0.160	-- --	50	45 - 120	25	55 - 120	20
Fluorene	86-73-7	28	BCL	0.250	0.0520	-- --	50	50 - 120	25	55 - 120	20
Hexachlorobenzene	118-74-1	0.1	BCL	0.250	0.0520	-- --	50	50 - 120	25	50 - 120	20
Hexachlorocyclopentadiene	77-47-4	20	BCL	0.750	0.310	-- --	50	20 - 125	30	30 - 125	25
Hexachloroethane	67-72-1	0.02	BCL	0.250	0.0700	-- --	50	35 - 120	30	40 - 120	20
Indeno[1,2,3-cd]pyrene	193-39-5	0.7	BCL	0.250	0.0980	-- --	50	20 - 130	30	30 - 135	25
Isophorone	78-59-1	0.03	BCL	0.250	0.0500	-- --	50	40 - 120	25	40 - 120	20
Naphthalene	91-20-3	4	BCL	0.250	0.0500	-- --	50	40 - 120	25	45 - 120	20
Nitrobenzene	98-95-3	0.007	BCL	0.250	0.0520	-- --	50	40 - 120	25	45 - 120	20
N-Nitrosodi-n-propylamine	621-64-7	0.000002	BCL	0.250	0.0520	-- --	50	35 - 120	25	40 - 120	20
N-Nitrosodiphenylamine	86-30-6	0.06	BCL	0.500	0.160	-- --	50	45 - 125	25	50 - 120	20
Octachlorostyrene	29082-74-4	--	--	0.650	0.120	-- --	50	60 - 140	30	60 - 140	30
Pentachlorophenol	87-86-5	0.001	BCL	0.500	0.260	-- --	50	30 - 120	25	40 - 120	20
Phenanthrene	85-01-8	0.14	CAL	0.330	0.150	-- --	50	50 - 120	25	50 - 120	20
Phenol	108-95-2	5	BCL	0.250	0.0680	-- --	50	40 - 120	25	40 - 120	20
Pyrene	129-00-0	210	BCL	0.250	0.100	-- --	50	40 - 125	30	45 - 125	25
2-Fluorophenol (Surr)	367-12-4	--	--	--	--	35 - 120	--	-- --	--	-- --	--

TABLE 5. LEACHING-BASED SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[2]					
						Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
2,4,6-Tribromophenol (Surr)	118-79-6	--	--	--	--	35 - 120	--	-- --	--	-- --	--
Nitrobenzene-d5 (Surr)	4165-60-0	--	--	--	--	35 - 120	--	-- --	--	-- --	--
Terphenyl-d14 (Surr)	1718-51-0	--	--	--	--	35 - 120	--	-- --	--	-- --	--
Phenol-d6 (Surr)	13127-88-3	--	--	--	--	35 - 120	--	-- --	--	-- --	--
EPA Method SW8315A											
Formaldehyde	50-00-0	0.000087	RSL	1	0.6	-- --	50	50 - 150	20	50 - 150	20
Polycyclic Aromatic Hydrocarbons (mg/kg)											
EPA Method SW8270C SIM											
Acenaphthene	83-32-9	29	BCL	0.03	0.004	-- --	50	45 - 120	25	50 - 120	20
Acenaphthylene	208-96-8	0.0106	CAL	0.03	0.004	-- --	50	45 - 120	20	50 - 120	20
Anthracene	120-12-7	590	BCL	0.03	0.004	-- --	50	55 - 120	25	55 - 120	20
Benzo(a)anthracene	56-55-3	0.08	BCL	0.03	0.004	-- --	50	50 - 120	25	55 - 120	20
Benzo(a)pyrene	50-32-8	0.40	BCL	0.03	0.004	-- --	50	45 - 125	25	50 - 125	20
Benzo(b)fluoranthene	205-99-2	0.20	BCL	0.03	0.004	-- --	50	45 - 125	30	45 - 125	25
Benzo(g,h,i)perylene	191-24-2	--	--	0.03	0.004	-- --	50	25 - 130	30	35 - 130	25
Benzo(k)fluoranthene	207-08-9	2	BCL	0.03	0.004	-- --	50	45 - 125	30	45 - 125	25
Chrysene	218-01-9	8	BCL	0.03	0.004	-- --	50	55 - 120	25	55 - 120	20
Dibenz(a,h)anthracene	53-70-3	0.08	BCL	0.03	0.004	-- --	50	25 - 135	30	40 - 135	25
Fluoranthene	206-44-0	210	BCL	0.03	0.004	-- --	50	45 - 120	25	55 - 120	20
Fluorene	86-73-7	28	BCL	0.03	0.004	-- --	50	50 - 120	25	55 - 120	20
Indeno(1,2,3-cd)pyrene	193-39-5	0.7	BCL	0.03	0.004	-- --	50	20 - 130	30	30 - 135	25
Naphthalene	91-20-3	4	BCL	0.03	0.004	-- --	50	40 - 120	25	45 - 120	20
Phenanthrene	85-01-8	0.024	CAL	0.03	0.004	-- --	50	50 - 120	25	50 - 120	20
Pyrene	129-00-0	210	BCL	0.03	0.004	-- --	50	40 - 125	30	45 - 125	25
2-Fluorobiphenyl (Surr)	321-60-8	--	--	--	--	35 - 120	--	-- --	--	-- --	--
Nitrobenzene-d5 (Surr)	4165-60-0	--	--	--	--	35 - 120	--	-- --	--	-- --	--
Terphenyl-d14 (Surr)	1718-51-0	--	--	--	--	35 - 120	--	-- --	--	-- --	--

TABLE 5. LEACHING-BASED SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source(1)	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS(2)					
						Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
Organophosphorus Pesticides (mg/kg)											
EPA Method SW8141A											
Atrazine	1912-24-9	--	--	0.067	0.0121	-- --	50	49 - 115	50	49 - 115	50
Chlorpyrifos	2921-88-2	0.12	RSL	0.020	0.00646	-- --	50	38 - 130	37	38 - 130	37
Coumaphos	56-72-4	--	--	0.013	0.0028	-- --	50	50 - 119	27	50 - 119	27
Demeton, Total	8065-48-3	--	--	0.039	0.00752	-- --	50	36 - 115	47	36 - 115	47
Diazinon	333-41-5	0.065	RSL	0.022	0.00727	-- --	50	53 - 115	40	53 - 115	40
Dichlorvos	62-73-7	0.000081	RSL	0.023	0.0074	-- --	50	43 - 139	77	43 - 139	77
Dimethoate	60-51-5	0.00099	RSL	0.022	0.00708	-- --	50	25 - 138	98	25 - 138	98
Disulfoton	298-04-4	0.00094	RSL	0.048	0.00773	-- --	50	29 - 115	40	29 - 115	40
EPN	2104-64-5	0.0028	RSL	0.013	0.00368	-- --	50	58 - 131	50	58 - 131	50
Ethoprop	13194-48-4	--	--	0.015	0.00493	-- --	50	53 - 115	54	53 - 115	54
Ethyl Parathion	56-38-2	0.43	RSL	0.018	0.00529	-- --	50	24 - 163	47	24 - 163	47
Famphur	52-85-7	--	--	0.013	0.00322	-- --	50	49 - 140	31	49 - 140	31
Fensulfothion	115-90-2	--	--	0.025	0.00815	-- --	50	52 - 121	49	52 - 121	49
Fenthion	55-38-9	--	--	0.033	0.00874	-- --	50	45 - 115	43	45 - 115	43
Malathion	121-75-5	0.1	RSL	0.015	0.00464	-- --	50	50 - 122	53	50 - 122	53
Merphos	150-50-5	0.059	RSL	0.030	0.00514	-- --	50	19 - 115	50	19 - 115	50
Methyl parathion	298-00-0	0.0074	RSL	0.020	0.00637	-- --	50	46 - 119	53	46 - 119	53
Mevinphos	7786-34-7	--	--	0.015	0.00462	-- --	50	10 - 226	78	10 - 226	78
Phorate	298-02-2	0.0034	RSL	0.020	0.0057	-- --	50	40 - 115	40	40 - 115	40
Ronnel	299-84-3	3.7	RSL	0.046	0.0152	-- --	50	43 - 118	41	43 - 118	41
Simazine	122-34-9	--	--	0.067	0.0221	-- --	50	11 - 179	58	11 - 179	58
Stirophos	22248-79-9	--	--	0.015	0.00436	-- --	50	44 - 118	24	44 - 118	24
Sulfotepp	3689-24-5	0.0052	RSL	0.020	0.00626	-- --	50	55 - 115	40	55 - 115	
Thionazin	297-97-2	--	--	0.018	0.00557	-- --	50	46 - 115	40	46 - 115	40
Trichloronate	327-98-0	--	--	0.020	0.00625	-- --	50	27 - 115	43	27 - 115	43
Chlormefos (Surr)	24934-91-6	--	--	--	--	42 132	--	-- --	--	-- --	--
Triphenylphosphate (Surr)	115-86-6	--	--	--	--	47 161	--	-- --	--	-- --	--

TABLE 5. LEACHING-BASED SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[2]					
						Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
Organochlorine Pesticides (mg/kg)											
EPA Method SW8081A, SW8081B											
2,4'-DDE	3424-82-6	--	--	0.005	0.0015	-- --	50	35 - 130	30	60 - 120	30
4,4'-DDD	72-54-8	0.8	BCL	0.005	0.0015	-- --	50	40 - 130	30	60 - 120	30
4,4'-DDE	72-55-9	3	BCL	0.005	0.0015	-- --	50	35 - 130	30	60 - 120	30
4,4'-DDT	50-29-3	2	BCL	0.005	0.0015	-- --	50	35 - 130	30	65 - 120	30
Aldrin	309-00-2	0.02	BCL	0.005	0.0015	-- --	50	40 - 115	30	50 - 115	30
alpha-BHC	319-84-6	0.0266	BCL	0.005	0.0015	-- --	50	40 - 115	30	60 - 115	30
alpha-Chlordane	57-74-9	0.50	BCL	0.050	0.01	-- --	50	60 - 140	30	60 - 140	30
beta-BHC	319-85-7	0.00545	BCL	0.005	0.0015	-- --	50	40 - 120	30	60 - 115	30
delta-BHC	319-86-8	28.1	BCL	0.010	0.0015	-- --	50	45 - 120	30	60 - 115	30
Dieldrin	60-57-1	0.00020	BCL	0.005	0.0015	-- --	50	40 - 125	30	65 - 115	30
Endosulfan I	959-98-8	--	--	0.005	0.0015	-- --	50	40 - 120	30	40 - 120	30
Endosulfan II	33213-65-9	--	--	0.005	0.0015	-- --	50	40 - 125	30	55 - 120	30
Endosulfan sulfate	1031-07-8	--	--	0.01	0.002	-- --	50	45 - 120	30	65 - 115	30
Endrin	72-20-8	0.05	BCL	0.005	0.0015	-- --	50	45 - 125	30	55 - 120	30
Endrin aldehyde	7421-93-4	--	--	0.005	0.0015	-- --	50	30 - 120	30	55 - 115	30
Endrin ketone	53494-70-5	--	--	0.005	0.002	-- --	50	40 - 120	30	65 - 115	30
gamma-BHC (Lindane)	58-89-9	0.0005	BCL	0.005	0.0015	-- --	50	40 - 120	30	55 - 115	30
gamma-Chlordane	57-74-9	0.50	BCL	0.050	0.01	-- --	50	60 - 140	30	60 - 140	30
Heptachlor	76-44-8	1.00	BCL	0.005	0.002	-- --	50	40 - 115	30	55 - 115	30
Heptachlor epoxide	1024-57-3	0.03	BCL	0.005	0.002	-- --	50	45 - 115	30	55 - 115	30
Methoxychlor	72-43-5	8.00	BCL	0.005	0.0015	-- --	50	40 - 135	30	65 - 120	30
Toxaphene	8001-35-2	2.00	BCL	0.200	0.05	-- --	50	60 - 140	30	60 - 140	30
Decachlorobiphenyl (Surr)	2051-24-3	--	--	--	--	45 - 120	--	-- --	--	-- --	--

TABLE 5. LEACHING-BASED SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[2]					
						Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
Dioxin/Furans (µg/kg) [5]											
EPA Method SW8290 or SW8280											
2,3,7,8-Tetrachloro dibenzo-p-dioxin	1746-01-6	0.045	CAL	0.001	EDL[4]	-- --	50	60 - 138	20	60 - 138	20
1,2,3,7,8-PeCDD	40321-76-4	0.025	CAL	0.005	EDL[4]	-- --	50	70 - 122	20	70 - 122	20
1,2,3,4,7,8-HxCDD[6]	39227-28-6	0.42	CAL	0.005	EDL[4]	-- --	50	60 - 138	20	60 - 138	20
1,2,3,6,7,8-HxCDD[6]	57653-85-7	0.42	CAL	0.005	EDL[4]	-- --	50	68 - 136	20	68 - 136	20
1,2,3,7,8,9-HxCDD[6]	19408-74-3	0.42	CAL	0.005	EDL[4]	-- --	50	68 - 138	20	68 - 138	20
1,2,3,4,6,7,8-HpCDD	35822-46-9	7.0	CAL	0.005	EDL[4]	-- --	50	71 - 128	20	71 - 128	20
OCDD	3268-87-9	390	CAL	0.01	EDL[4]	-- --	50	70 - 128	20	70 - 128	20
2,3,7,8-TCDF	51207-31-9	0.084	CAL	0.001	EDL[4]	-- --	50	56 - 158	20	56 - 158	20
1,2,3,7,8-PeCDF	57117-41-6	0.47	CAL	0.005	EDL[4]	-- --	50	69 - 134	20	69 - 134	20
2,3,4,7,8-PeCDF	57117-31-4	0.47	CAL	0.005	EDL[4]	-- --	50	70 - 131	20	70 - 131	20
1,2,3,4,7,8-HxCDF	70648-26-9	0.23	CAL	0.005	EDL[4]	-- --	50	74 - 128	20	74 - 128	20
1,2,3,6,7,8-HxCDF	57117-44-9	0.23	CAL	0.005	EDL[4]	-- --	50	67 - 140	20	67 - 140	20
1,2,3,7,8,9-HxCDF	72918-21-9	0.23	CAL	0.005	EDL[4]	-- --	50	72 - 134	20	72 - 134	20
2,3,4,6,7,8-HxCDF	60851-34-5	0.23	CAL	0.005	EDL[4]	-- --	50	71 - 137	20	71 - 137	20
1,2,3,4,6,7,8-HpCDF	67562-39-4	3.9	CAL	0.005	EDL[4]	-- --	50	71 - 134	20	71 - 134	20
1,2,3,4,7,8,9-HpCDF	55673-89-7	3.9	CAL	0.005	EDL[4]	-- --	50	68 - 129	20	68 - 129	20
OCDF	39001-02-0	220	CAL	0.01	EDL[4]	-- --	50	63 - 141	20	63 - 141	20
PCBs as Congeners (µg/kg) [5]											
EPA Method 1668A											
Total PCBs	1336-36-3	78	RSL	0.2	EDL[4]	-- --	50	-- --	--	-- --	--
3,4,4',5-TeCB (PCB-81)	70362-50-4	0.062	RSL	0.002	EDL[4]	-- --	50	50 - 150	50	50 - 150	50
2,3',4,4',5-PeCB (PCB-118)	31508-00-6	1.0	RSL	0.002	EDL[4]	-- --	50	50 - 150	50	50 - 150	50
3,3',4,4',5-PeCB (PCB-126)	57465-28-8	0.0003	RSL	0.002	EDL[4]	-- --	50	50 - 150	50	50 - 150	50
3,3',4,4',5,5'-HxCB (PCB-169)	32774-16-6	0.0017	RSL	0.002	EDL[4]	-- --	50	50 - 150	50	50 - 150	50
DeCB (PCB-209)	2051-24-3	78	RSL	0.02	EDL[4]	-- --	50	50 - 150	50	50 - 150	50

TABLE 5. LEACHING-BASED SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[2]					
						Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
PCBs as Aroclors (µg/kg)											
EPA Method SW8082											
Aroclor-1260	11096-82-5	16	CAL	50	17	-- --	50	50 - 125	30	65 - 115	30
DCB Decachlorobiphenyl (Surr)	2051-24-3	--	--	--	--	45 - 120	--	-- --	--	-- --	--
Organic Acids (mg/kg)											
EPA Method SW8270C											
Phthalic acid[7]	88-99-3	--	--	2.5	0.76	-- --	50	-- --	--	-- --	--
2-fluorobiphenyl (Surr)	321-60-8	--	--	--	--	29 - 120	--	-- --	--	-- --	--
Total Petroleum Hydrocarbons (mg/kg)											
EPA Method SW8015B											
Total petroleum hydrocarbon-gasoline	TPH-gasoline	--	--	0.4	0.15	-- --	50	60 - 140	30	70 - 135	20
4-Bromofluorobenzene (Surr)	460-00-4	--	--	--	--	65 - 140	--	-- --	--	-- --	--
Diesel Range Organics (C10-C28)	TPH-diesel	--	--	5	2.5	-- --	50	40 - 120	30	45 - 115	25
Oil Range Organics (C29-C40)	TPH-oil	--	--	5	2.5	-- --	50	40 - 120	30	45 - 115	25
n-Octacosane (Surr)	630-02-4	--	--	--	--	40 140	--	-- --	--	-- --	--
Others (mg/kg)											
SM 2320B											
Alkalinity as $CaCO_3$	--	--	--	500	--	-- --	50	-- --	--	90 110	20
Bicarbonate as HCO_3^-	--	--	--	610	--	-- --	50	-- --	--	-- --	--
Carbonate as CO_3^-	--	--	--	300	--	-- --	50	-- --	--	-- --	--
Hydroxide as OH^-	14280-30-9	--	--	170	--	-- --	50	-- --	--	-- --	--
SM 4500-NH_3 D											
Ammonia as NH_3	7664-41-7	--	--	12	2.4	-- --	50	75 - 125	15	85 - 115	15

TABLE 5. LEACHING-BASED SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source(1)	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS(2) Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
EPA Method 9056A											
Bromide	24959-67-9	87	BCL	5	3.5	-- --	50	80 - 120	20	90 - 110	20
Chloride	16887-00-6	--	--	5	4	-- --	50	80 - 120	20	90 - 110	20
Fluoride	16984-48-8	120	RSL	5	3.5	-- --	50	80 - 120	20	90 - 110	20
Nitrate	14797-55-8	7.0	BCL	1.1	0.8	-- --	50	80 - 120	20	90 - 110	20
Nitrite	14797-65-0	--	--	1.5	1.1	-- --	50	80 - 120	20	90 - 110	20
Ortho-Phosphate as PO_4	14265-44-2	--	--	5	4	-- --	50	80 - 120	20	90 - 110	20
Sulfate	14808-79-8	--	--	5	4	-- --	50	80 - 120	20	90 - 110	20
EPA Method 300.1											
Chlorate	7790-93-4	--	--	0.2	0.05	-- --	50	75 - 125	25	75 - 125	25
Dichloroacetic acid (Surr)	79-43-6	--	--	--	--	90 - 115	--	-- --	--	-- --	--
EPA Method 314.0											
Perchlorate	14797-73-0	0.0241	BCL	0.04	0.0095	-- --	50	80 - 120	20	85 - 115	15
EPA Method SW9045D											
pH	pH	--	--	0.1	--	-- --	50	-- --	--	-- --	--
Radionuclides (pCi/g)(8)											
See Table 1 for Individual Methods											
Radium-226	13982-63-3	0.016	RAD	1	--	-- --	50	72 - 140	40	65 - 140	40
Radium-228	15262-20-1	0.016	RAD	1	--	-- --	50	30 - 150	40	61 - 139	40
Thorium-228	14274-82-9	0.11	BCL	1	--	-- --	50	70 - 130	40	70 - 130	40
Thorium-230	14269-63-7	0.042	BCL	1	--	-- --	50	76 - 115	40	81 - 118	40
Thorium-232	7440-29-1	0.14	BCL	1	--	-- --	50	70 - 130	40	70 - 130	40
Uranium-234	13966-29-5	0.012	RAD	1	--	-- --	50	70 - 130	40	84 - 120	40
Uranium-235	15117-96-1	0.012	RAD	1	--	-- --	50	-- --	40	-- --	40
Uranium-238	7440-61-1	0.012	RAD	1	--	-- --	50	70 - 130	40	82 - 122	40

TABLE 5. LEACHING-BASED SOIL ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)	Method Detection Limit (MDL)	QUALITY CONTROL LIMITS[2]					
						Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
Asbestos (protocol structures)											
Total Amphibole Protocol Structures	1332-21-4	--	--	Fiber Count[9]		-- --	50	-- --	--	-- --	--
Long Amphibole Protocol Structures	1332-21-4	--	--	Fiber Count[9]		-- --	50	-- --	--	-- --	--
Total Chrysotile Protocol Structures	1332-21-4	--	--	Fiber Count[9]		-- --	50	-- --	--	-- --	--
Long Chrysotile Protocol Structures	1332-21-4	--	--	Fiber Count[9]		-- --	50	-- --	--	-- --	--
Total Asbestos Protocol Structures	1332-21-4	--	--	Fiber Count[9]		-- --	50	-- --	--	-- --	--
Long Asbestos Protocol Structures	1332-21-4	--	--	Fiber Count[9]		-- --	50	-- --	--	-- --	--

Notes:

Shaded PQLs and MDLs exceed the lowest screening criteria.

µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
pCi/g = picoCurie per gram
Surr = Surrogate
EPA = United States Environmental Protection Agency
SM = Standard Method

(1) Soil screening levels were selected according to the following hierarchy of criteria:
- (a) Basic Comparison Level (BCL): Leaching-based basic comparison levels (LBCL) with dilution attenuation factor (DAF) of 1 in the most recent version of Nevada Division of Environmental Protection (NDEP) documents (July 2017 for non-radionuclides and April 2009 for radionuclides).
- (b) Regional Screening Level (RSL): United States Environmental Protection Agency (USEPA) Regional Screening Levels (RSL) for groundwater protection (June 2017), with the maximum contaminant level (MCL) based screening levels selected over the risk-based screening levels, if available (USEPA 2017).
- (c) Radiation Criteria (RAD): USEPA Screening criteria from Soil Screening Guidance for Radionuclides: User's Guide, 2000 (USEPA 2013b).
- (d) Calculated Criteria (CAL): Generic leaching-based BSLs (LBCLs) calculated using the approach presented in NDEP guidance (NDEP 2017).

All other individual or grouped dioxins or furans don't have screening levels.
All other individual or grouped PCBs use MCL-based screening levels for low risk PCBs in RSL table.

Notes:

(2) QC Limits = Quality Control Limits for %R (Percent Recovery) of spiked compounds in Laboratory Control Samples (LCS) and surrogate compounds and Relative Percent Difference (RPD) between Matrix Spike (MS) and MS Duplicate (MSD) samples and LCS and LCS duplicate (LCSD) samples. Laboratory historical control limits are subject to change as a result of periodic re-evaluation. Limits in use at the time of sample analysis are available from the laboratory. Duplicate RPDs apply to sample duplicates and field

(3) PQLs and MDLs for zirconium are under development by the laboratory and are not yet available.

(4) EDL = Estimated Detection Limit. For each dioxin, furan, or PCB not detected, an EDL is calculated. The sample specific EDL is an estimate made by the laboratory of the concentration of a given chemical that would have to be present to produce a signal with a peak height of at least 2.5 times the background signal level. The estimate is specific to a particular analysis of the sample and will be affected by sample size, dilution, and so forth. Because of the toxicological significance of dioxins, the EDL value is reported for non-detected chemicals rather than reporting the MDL.

(5) Dioxins and PCBs should be reported to the estimated detection limit (EDL). Dioxin toxicity equivalents (TEQ) will be calculated for the 16 dioxin and furan congeners and 12 PCB congeners with toxicity equivalent factors (TEFs) defined by the World Health Organization (Van den Berg et al. 2006) substituting half the EDL for the congeners not detected.

(6) The total hexachlorodibenzo-p-dioxin (HxCDD) will be compared to an RSL of 0.017 μg/kg.

(7) Phthalic acid will be run with the SVOCs by EPA Method 8270C.

(8) Radionuclide PQLs and MDLs are based on minimum detectable activity (MDA) values. The measured values are reported regardless of sample-specific MDA.

(9) Asbestos data will be reported as raw asbestos fiber counts per sample (NDEP 2008). There are no PQLs for this method, but sensitivity is calculated by the concentration of protocol structures per volume of PM10.

Sources:

NDEP. 2009b. Guidance for Evaluating Radionuclide Data, BMI Plant Sites and Common Areas Projects, Henderson, Nevada. February 6.

NDEP. 2017. User's Guide and Background Technical Document for NDEP Basic Comparison Levels (BCLs) for Human Health for the BMI Complex and Common Areas. Revision 14, July.

USEPA. 2013b. Preliminary Remediation Goals for Radionuclides. On-line calculator. http://epa-prgs.ornl.gov/cgi-bin/radionuclides/rprg_search

USEPA. 2017. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. June.

Van den Berg et al. 2006. The 2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds. May 20.

TABLE 6. GROUNDWATER ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)[2]	Method Detection Limit (MDL)[2]	QUALITY CONTROL LIMITS[3] Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike/LCS %R	Blank Spike/LCS RPD
Metals (µg/L)											
EPA Method 200.7 / SW6010B, SW6010C											
Aluminum	7429-90-5	50	MCL	200	70.4	-- --	30	75 - 125	20	80 - 120	20
Barium	7440-39-3	2,000	MCL	10	6	-- --	30	75 - 125	20	80 - 120	20
Boron	7440-42-8	6,670	BCL	200	25.4	-- --	30	75 - 125	20	80 - 120	20
Beryllium	7440-41-7	4	MCL	2	0.46	-- --	30	75 - 125	20	80 - 120	20
Cadmium	7440-43-9	5	MCL	5	2	-- --	30	75 - 125	20	80 - 120	20
Calcium	7440-70-2	--	--	1000	389	-- --	30	75 - 125	20	80 - 120	20
Chromium (total)	7440-47-3	100	MCL	10	5	-- --	30	75 - 125	20	80 - 120	20
Cobalt	7440-48-4	10	BCL	10	2	-- --	30	75 - 125	20	80 - 120	20
Copper	7440-50-8	1,300	MCL	10	4.69	-- --	30	75 - 125	20	80 - 120	20
Iron	7439-89-6	23,400	BCL	400	29.6	-- --	30	75 - 125	20	80 - 120	20
Lead	7439-92-1	15	MCL	15	3	-- --	30	75 - 125	20	80 - 120	20
Magnesium	7439-95-4	207,000	BCL	2000	55	-- --	30	75 - 125	20	80 - 120	20
Manganese	7439-96-5	801	BCL	20	7	-- --	30	75 - 125	20	80 - 120	20
Molybdenum	7439-98-7	167	BCL	20	2	-- --	30	75 - 125	20	80 - 120	20
Nickel	7440-02-0	667	BCL	10	2.98	-- --	30	75 - 125	20	80 - 120	20
Phosphorus	7723-14-0	0.667	BCL	250	108	-- --	30	75 - 125	20	80 - 120	20
Potassium	7440-09-7	--	--	2000	510	-- --	30	75 - 125	20	80 - 120	20
Silicon	7440-21-3	--	--	200	98.1	-- --	30	75 - 125	20	80 - 120	20
Silver	7440-22-4	100	BCL	10	6	-- --	30	75 - 125	20	80 - 120	20
Sodium	7440-23-5	--	--	3000	1400	-- --	30	75 - 125	20	80 - 120	20
Strontium	7440-24-6	20,000	BCL	100	0.6	-- --	30	75 - 125	20	80 - 120	20
Tin	7440-31-5	20,000	BCL	100	12	-- --	30	75 - 125	20	80 - 120	20
Titanium	7440-32-6	133,000	BCL	50	5.13	-- --	30	75 - 125	20	80 - 120	20
Tungsten	7440-33-7	26.7	BCL	1000	500	-- --	30	75 - 125	20	80 - 120	20
Vanadium	7440-62-2	167	BCL	20	6.34	-- --	30	75 - 125	20	80 - 120	20
Zinc	7440-66-6	10,000	BCL	50	9.16	-- --	30	75 - 125	20	80 - 120	20
Zirconium	7440-67-7	2.67	BCL	15	2.38	-- --	30	75 - 125	20	80 - 120	20

TABLE 6. GROUNDWATER ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source(1)	Practical Quantitation Limit (PQL)(2)	Method Detection Limit (MDL)(2)	QUALITY CONTROL LIMITS(3) Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike/LCS %R	Blank Spike/LCS RPD
EPA Method 200.8 / SW6020											
Antimony	7440-36-0	6	MCL	10	7	-- --	30	75 - 125	20	80 - 120	20
Arsenic	7440-38-2	10	MCL	2	0.735	-- --	30	75 - 125	20	80 - 120	20
Selenium	7782-49-2	50	MCL	2	0.657	-- --	30	75 - 125	20	80 - 120	20
Thallium	7440-28-0	2	MCL	10	8	-- --	30	75 - 125	20	80 - 120	20
EPA Method SW6020A											
Niobium	7440-03-1	33.4	BCL	25	2.23	-- --	30	75 - 125	20	80 - 120	20
Palladium	7440-05-3	--	--	0.5	0.09	-- --	30	75 - 125	20	80 - 120	20
Sulfur	7704-34-9	--	--	5000	267	-- --	30	75 - 125	20	80 - 120	20
Uranium	7440-61-1	30	MCL	20	7.537	-- --	30	75 - 125	20	80 - 120	20
EPA Method 218.6											
Chromium (hexavalent)	18540-29-9	0.134	BCL	1	0.25	-- --	30	90 - 110	10	90 - 110	10
EPA Method SW7199											
Chromium (hexavalent)	18540-29-9	0.134	BCL	2	0.25	-- --	30	90 - 110	10	90 - 110	10
EPA Method SW7470A											
Mercury	7439-97-6	2	MCL	0.5	0.06	-- --	30	70 - 130	20	80 - 120	20
EPA Method 1632A											
Arsenic III	7440-38-2	--	--	0.02	0.003	-- --	30	30 - 170	35	40 - 160	25
Total Inorganic Arsenic(4)	7440-38-2	10	MCL	0.02	0.003	-- --	30	80 - 120	35	60 - 140	25
Volatile Organic Compounds (µg/L)											
EPA Method SW8260B											
1,1,1,2-Tetrachloroethane	630-20-6	0.587	BCL	1	0.250	-- --	30	60 - 149	20	60 - 141	20
1,1,1-Trichloroethane	71-55-6	200	MCL	1	0.250	-- --	30	70 - 130	20	70 - 130	20
1,1,2,2-Tetrachloroethane	79-34-5	0.0752	BCL	1	0.250	-- --	30	63 - 130	30	63 - 130	25
1,1,2-Trichloroethane	79-00-5	5	MCL	1	0.250	-- --	30	70 - 130	25	70 - 130	20
1,1-Dichloroethane	75-34-3	2.7	BCL	1	0.250	-- --	30	65 - 130	20	64 - 130	20
1,1-Dichloroethene	75-35-4	7	MCL	1	0.250	-- --	30	70 - 130	20	70 - 130	20
1,1-Dichloropropene	563-58-6	--	--	1	0.250	-- --	30	64 - 130	20	70 - 130	20
1,2,3-Trichlorobenzene	87-61-6	7	RSL	1	0.400	-- --	30	60 - 140	20	60 - 140	20
1,2,3-Trichloropropane	96-18-4	0.00224	BCL	2.5	0.400	-- --	30	60 - 130	30	63 - 130	20

TABLE 6. GROUNDWATER ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)[2]	Method Detection Limit (MDL)[2]	QUALITY CONTROL LIMITS[3]					
						Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
1,2,4-Trichlorobenzene	120-82-1	70	MCL	1	0.400	-- --	30	60 - 140	20	60 - 140	20
1,2,4-Trimethylbenzene	95-63-6	14.6	BCL	1	0.250	-- --	30	70 - 130	25	70 - 135	20
1,2-Dibromo-3-Chloropropane	96-12-8	0.2	MCL	5	0.500	-- --	30	48 - 140	30	52 - 140	30
1,2-Dibromoethane (EDB)	106-93-4	0.05	MCL	1	0.250	-- --	30	70 - 131	25	70 - 130	20
1,2-Dichlorobenzene	95-50-1	600	MCL	1	0.250	-- --	30	70 - 130	20	70 - 130	20
1,2-Dichloroethane	107-06-2	5	MCL	1	0.250	-- --	30	56 - 146	20	57 - 138	20
1,2-Dichloroethene	540-59-0	130	RSL	1		-- --	30	-			
1,2-Dichloropropane	78-87-5	5	MCL	1	0.250	-- --	30	69 - 130	20	67 - 130	20
1,3,5-Trimethylbenzene	108-67-8	334	BCL	1	0.250	-- --	30	70 - 130	20	70 - 136	20
1,3-Dichlorobenzene	541-73-1	80.7	BCL	1	0.250	-- --	30	70 - 130	20	70 - 130	20
1,3-Dichloropropane	142-28-9	667	BCL	1	0.250	-- --	30	70 - 130	25	70 - 130	20
1,4-Dichlorobenzene	106-46-7	75	MCL	1	0.250	-- --	30	70 - 130	20	70 - 130	20
2,2-Dichloropropane	594-20-7	--	--	1	0.400	-- --	30	69 - 138	25	68 - 141	25
2-Butanone	78-93-3	6,860	BCL	10	2.50	-- --	30	48 - 140	40	44 - 150	35
2-Chlorotoluene	95-49-8	667	BCL	1	0.250	-- --	30	70 - 130	20	70 - 130	20
4-Chlorotoluene	106-43-4	667	RSL	1	0.250	-- --	30	70 - 130	20	70 - 130	20
Benzene	71-43-2	5	MCL	1	0.250	-- --	30	66 - 130	20	68 - 130	20
Bromobenzene	108-86-1	85.2	BCL	1	0.250	-- --	30	70 - 130	20	70 - 130	20
Bromochloromethane	74-97-5	83.4	RSL	1	0.250	-- --	30	70 - 130	25	70 - 130	20
Bromodichloromethane	75-27-4	0.133	BCL	1	0.250	-- --	30	70 - 138	20	70 - 132	20
Bromoform	75-25-2	3.19	BCL	1	0.400	-- --	30	59 - 150	25	60 - 148	25
Bromomethane	74-83-9	8.53	BCL	5	0.250	-- --	30	62 - 131	25	64 - 139	20
Carbon tetrachloride	56-23-5	5	MCL	1	0.250	-- --	30	60 - 150	25	60 - 150	25
Chlorobenzene	108-90-7	100	MCL	1	0.250	-- --	30	70 - 130	20	70 - 130	20
Chloroethane	75-00-3	20,900	BCL	5	0.400	-- --	30	68 - 130	25	64 - 135	20
Chloroform	67-66-3	0.219	BCL	5	0.250	-- --	30	70 - 130	20	70 - 130	20
Chloromethane	74-87-3	188	BCL	2.5	0.250	-- --	30	39 - 144	25	47 - 140	25
cis-1,2-Dichloroethene	156-59-2	66.7	MCL	1	0.250	-- --	30	70 - 130	20	70 - 133	20
cis-1,3-Dichloropropene	10061-01-5	--	--	1	0.250	-- --	30	70 - 133	20	70 - 133	25
Dibromochloromethane	124-48-1	0.8	BCL	1	0.250	-- --	30	70 - 148	25	69 - 145	20

TABLE 6. GROUNDWATER ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source(1)	Practical Quantitation Limit (PQL)(2)	Method Detection Limit (MDL)(2)	QUALITY CONTROL LIMITS(3) Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike/LCS %R	Blank Spike/LCS RPD
Dibromomethane	74-95-3	8.16	BCL	1	0.250	-- --	30	70 - 130	25	70 - 130	20
Dichlorodifluoromethane	75-71-8	202	BCL	5	0.400	-- --	30	25 - 142	30	29 - 150	30
Ethyl tert-butyl ether (ETBE)	637-92-3	--	--	1	0.250	-- --	30	70 - 130	25	60 - 136	20
Ethylbenzene	100-41-4	700	MCL	1	0.250	-- --	30	70 - 130	20	70 - 130	20
Hexachlorobutadiene	87-68-3	0.197	BCL	1	0.250	-- --	30	10 - 150	20	10 - 150	20
Isopropyl benzene	98-82-8	3,340	BCL	1	0.250	-- --	30	70 - 132	20	70 - 136	20
m,p-Xylene	179601-23-1	10,000	MCL	2	0.500	-- --	30	70 - 133	25	70 - 130	20
Methylene chloride	75-09-2	5	MCL	5	0.880	-- --	30	52 - 130	20	52 - 130	20
Naphthalene	91-20-3	0.165	BCL	5	0.400	-- --	30	60 - 140	30	60 - 140	25
n-Butylbenzene	104-51-8	1,670	BCL	1	0.400	-- --	30	61 - 149	20	65 - 150	20
n-Propylbenzene	103-65-1	1,280	BCL	1	0.250	-- --	30	66 - 135	20	67 - 139	20
o-Xylene	95-47-6	10,000	MCL	1	0.250	-- --	30	70 - 133	20	70 - 130	20
p-Isopropyltoluene	99-87-6	834	BCL	1	0.250	-- --	30	70 - 130	20	70 - 132	20
sec-Butylbenzene	135-98-8	3,340	BCL	1	0.250	-- --	30	67 - 134	20	70 - 138	20
Styrene	100-42-5	100	MCL	1	0.250	-- --	30	29 - 150	35	70 - 134	20
tert-Butylbenzene	98-06-6	3,340	BCL	1	0.250	-- --	30	70 - 130	20	70 - 130	20
Tetrachloroethylene (PCE)	127-18-4	5	MCL	1	0.250	-- --	30	70 - 137	20	70 - 130	20
Toluene	108-88-3	1,000	MCL	1	0.250	-- --	30	70 - 130	20	70 - 130	20
trans-1,2-Dichloroethene	156-60-5	100	MCL	1	0.250	-- --	30	70 - 130	20	70 - 130	20
trans-1,3-Dichloropropene	10061-02-6	--	--	1	0.250	-- --	30	70 - 138	25	70 - 132	20
Trichloroethylene (TCE)	79-01-6	5	MCL	1	0.250	-- --	30	70 - 130	20	70 - 130	20
Trichlorofluoromethane	75-69-4	10,000	BCL	5	0.250	-- --	30	60 - 150	25	60 - 150	20
Vinyl chloride	75-01-4	2	MCL	1	0.250	-- --	30	50 - 137	30	59 - 133	30
4-Bromofluorobenzene (Surr)	460-00-4	--	--	--	--	77 - 126	--	-- --	--	-- --	--
Dibromofluoromethane (Surr)	1868-53-7	--	--	--	--	76 - 132	--	-- --	--	-- --	--
Toluene-d8 (Surr)	2037-26-5	--	--	--	--	80 - 128	--	-- --	--	-- --	--

TABLE 6. GROUNDWATER ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)[2]	Method Detection Limit (MDL)[2]	QUALITY CONTROL LIMITS[3]					
						Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
EPA Method SW8260B SIM											
1,2,3-Trichloropropane	96-18-4	0.00224	BCL	0.005	0.0035	-- --	30	55 - 135	30	60 - 130	20
1,4-Dioxane	123-91-1	0.672	BCL	2	0.5	-- --	30	70 - 130	30	70 - 125	30
Dibromofluoromethane (Surr)	1868-53-7	--	--	--	--	80 - 120	--	-- --	--	-- --	--
Semivolatile Organic Compounds (µg/L)											
EPA Method SW8270C, SW8270D											
1,2,4-Trichlorobenzene	120-82-1	70	MCL	1.00	0.200	-- --	30	45 - 120	20	44 - 120	20
1,2-Dichlorobenzene	95-50-1	600	MCL	0.500	0.200	-- --	30	40 - 120	25	43 - 120	25
1,2-Diphenylhydrazine (as Azobenzene)	103-33-3	0.14	BCL	1.00	0.200	-- --	30	60 - 120	25	59 - 124	25
1,3-Dichlorobenzene	541-73-1	80.7	BCL	0.500	0.200	-- --	30	35 - 120	25	41 - 120	25
1,4-Dichlorobenzene	106-46-7	75	MCL	0.500	0.200	-- --	30	35 - 120	25	41 - 120	25
1-Methylnaphthalene	90-12-0	1.1	RSL	10	3.5	-- --	30	55 - 120	30	60 - 140	35
2,4,5-Trichlorophenol	95-95-4	3,340	BCL	2.00	0.300	-- --	30	55 - 120	30	20 - 138	30
2,4,6-Trichlorophenol	88-06-2	6.11	BCL	1.00	0.100	-- --	30	55 - 120	30	20 - 139	30
2,4-Dichlorophenol	120-83-2	100	BCL	2.00	0.200	-- --	30	55 - 120	25	21 - 132	20
2,4-Dimethylphenol	105-67-9	667	BCL	2.00	0.500	-- --	30	40 - 120	25	51 - 120	25
2,4-Dinitrophenol	51-28-5	66.7	BCL	5.00	1.00	-- --	30	40 - 120	25	20 - 134	25
2,4-Dinitrotoluene	121-14-2	0.217	BCL	5.00	2.00	-- --	30	65 - 120	25	54 - 121	20
2,6-Dinitrotoluene	606-20-2	0.0448	BCL	5.00	2.00	-- --	30	65 - 120	20	54 - 121	20
2-Chloronaphthalene	91-58-7	2,670	BCL	0.500	0.100	-- --	30	60 - 120	20	54 - 120	20
2-Chlorophenol	95-57-8	167	BCL	1.00	0.100	-- --	30	45 - 120	25	20 - 122	25
2-Methylnaphthalene	91-57-6	36	RSL	1.00	0.100	-- --	30	55 - 120	20	55 - 120	20
2-Methylphenol	95-48-7	1,670	BCL	2.00	0.300	-- --	30	50 - 120	25	47 - 120	20
2-Nitroaniline	88-74-4	334	BCL	5.00	2.00	-- --	30	65 - 120	25	46 - 126	20
2-Nitrophenol	88-75-5	--	--	2.00	0.200	-- --	30	50 - 120	25	21 - 132	25
3,3'-Dichlorobenzidine	91-94-1	0.149	BCL	5.00	1.00	-- --	30	45 - 135	25	25 - 135	25
3-Methylphenol + 4-Methylphenol	106-44-5	--	--	5.00	1.00	-- --	30	50 - 120	25	50 - 120	20
3-Nitroaniline	99-09-2	--	--	5.00	2.00	-- --	30	60 - 120	25	42 - 122	25

TABLE 6. GROUNDWATER ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source(1)	Practical Quantitation Limit (PQL)(2)	Method Detection Limit (MDL)(2)	QUALITY CONTROL LIMITS(3)					
						Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
4,6-Dinitro-2-methylphenol	534-52-1	--	--	5.00	1.00	-- --	30	45 - 120	25	22 - 147	25
4-Bromophenyl phenyl ether	101-55-3	--	--	1.00	0.100	-- --	30	60 - 120	25	58 - 120	25
4-Chloro-3-methylphenol	59-50-7	1,400	RSL	2.00	0.200	-- --	30	60 - 120	25	46 - 123	25
4-Chloroaniline	106-47-8	0.336	BCL	2.00	1.00	-- --	30	55 - 120	25	52 - 120	25
4-Chlorophenyl phenyl ether	7005-72-3	--	--	0.500	0.100	-- --	30	65 - 120	25	50 - 122	20
4-Nitroaniline	100-01-6	3.8	RSL	5.00	2.00	-- --	30	55 - 125	25	46 - 126	20
4-Nitrophenol	100-02-7	267	BCL	5.00	2.00	-- --	30	45 - 120	30	20 - 151	30
Acenaphthene	83-32-9	2,000	BCL	0.500	0.100	-- --	30	60 - 120	25	57 - 120	20
Acenaphthylene	208-96-8	6.22	BCL	0.500	0.100	-- --	30	60 - 120	25	60 - 120	20
Aniline	62-53-3	11.8	BCL	10.0	0.750	-- --	30	35 - 120	30	53 - 120	30
Anthracene	120-12-7	100,000	BCL	0.500	0.100	-- --	30	65 - 120	25	62 - 120	20
Benzidine	92-87-5	--	--	10.0	5.00	-- --	30	30 - 160	35	20 - 168	35
Benzo[a]anthracene	56-55-3	0.0328	BCL	5.00	1.00	-- --	30	65 - 120	20	62 - 120	20
Benzo[a]pyrene	50-32-8	0.2	MCL	2.00	0.200	-- --	30	55 - 130	25	58 - 103	25
Benzo[b]fluoranthene	205-99-2	0.0921	BCL	2.00	0.300	-- --	30	55 - 125	25	46 - 125	25
Benzo[g,h,i]perylene	191-24-2	1,000	BCL	5.00	1.00	-- --	30	45 - 135	30	52 - 136	25
Benzo[k]fluoranthene	207-08-9	0.921	BCL	0.500	0.100	-- --	30	55 - 125	30	61 - 127	20
Benzoic acid	65-85-0	133,000	BCL	10.0	4.00	-- --	30	25 - 125	30	20 - 120	30
Benzyl alcohol	100-51-6	3,340	BCL	5.00	1.00	-- --	30	40 - 120	30	50 - 120	20
bis (2-chloroisopropyl) ether	108-60-1	1,330	BCL	0.500	0.100	-- --	30	45 - 120	25	45 - 120	20
Bis(2-chloroethoxy)methane	111-91-1	59	RSL	0.500	0.200	-- --	30	50 - 120	25	57 - 120	20
Bis(2-chloroethyl)ether	111-44-4	0.0133	BCL	0.500	0.0500	-- --	30	50 - 120	25	54 - 120	20
Bis(2-ethylhexyl) phthalate	117-81-7	6	MCL	5.00	2.00	-- --	30	65 - 130	25	57 - 124	20
Butyl benzyl phthalate	85-68-7	35.4	BCL	5.00	2.00	-- --	30	55 - 130	25	57 - 129	20
Chrysene	218-01-9	9.21	BCL	0.500	0.100	-- --	30	65 - 120	25	63 - 109	20
Dibenz(a,h)anthracene	53-70-3	0.00921	BCL	0.500	0.200	-- --	30	45 - 135	30	56 - 124	25
Dibenzofuran	132-64-9	33.4	BCL	0.500	0.200	-- --	30	65 - 120	25	59 - 109	20
Diethyl phthalate	84-66-2	26,700	BCL	1.00	0.200	-- --	30	55 - 120	30	44 - 131	30
Dimethyl phthalate	131-11-3	334,000	BCL	0.500	0.100	-- --	30	30 - 120	30	33 - 140	30
Di-n-butyl phthalate	84-74-2	3,340	BCL	2.00	0.500	-- --	30	60 - 125	25	60 - 126	20
Di-n-octyl phthalate	117-84-0	200	RSL	5.00	1.00	-- --	30	65 - 135	20	56 - 117	20

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QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source(1)	Practical Quantitation Limit (PQL)(2)	Method Detection Limit (MDL)(2)	QUALITY CONTROL LIMITS(3) Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike/LCS %R	Blank Spike/LCS RPD
Fluoranthene	206-44-0	1,330	BCL	0.500	0.100	-- --	30	60 - 120	25	64 - 120	20
Fluorene	86-73-7	1,330	BCL	0.500	0.100	-- --	30	65 - 120	25	52 - 120	20
Hexachlorobenzene	118-74-1	1	MCL	1.00	0.100	-- --	30	60 - 120	25	60 - 105	20
Hexachlorobutadiene	87-68-3	0.197	BCL	2.00	0.500	-- --	30	40 - 120	25	34 - 120	25
Hexachlorocyclopentadiene	77-47-4	50	MCL	5.00	2.00	-- --	30	25 - 120	30	23 - 120	30
Hexachloroethane	67-72-1	0.392	BCL	3.00	0.500	-- --	30	35 - 120	25	34 - 120	25
Indeno[1,2,3-cd]pyrene	193-39-5	0.0921	BCL	2.00	0.400	-- --	30	40 - 135	30	59 - 128	25
Isophorone	78-59-1	70.8	BCL	1.00	0.200	-- --	30	50 - 120	25	50 - 120	20
Naphthalene	91-20-3	0.165	BCL	1.00	0.0500	-- --	30	55 - 120	25	52 - 120	20
Nitrobenzene	98-95-3	0.14	BCL	1.00	0.200	-- --	30	55 - 120	25	52 - 120	25
N-Nitrosodi-n-propylamine	621-64-7	0.0096	BCL	2.00	0.200	-- --	30	45 - 120	25	60 - 120	20
N-Nitrosodiphenylamine	86-30-6	13.7	BCL	1.00	0.200	-- --	30	60 - 120	25	58 - 120	20
Octachlorostyrene	29082-74-4	--	--	20	6.5	-- --	30	60 - 140	30	60 - 140	30
Pentachlorophenol	87-86-5	1	MCL	2.00	1.00	-- --	30	24 - 121	25	20 - 137	25
Phenanthrene	85-01-8	6.22	BCL	0.500	0.100	-- --	30	65 - 120	25	62 - 120	20
Phenol	108-95-2	10,000	BCL	1.00	0.100	-- --	30	40 - 120	25	20 - 120	25
Pyrene	129-00-0	1,000	BCL	0.500	0.100	-- --	30	55 - 125	25	54 - 120	25
2,4,6-Tribromophenol (Surr)	118-79-6	--	--	--	--	40 - 120	--	-- --	--	-- --	--
2-Fluorophenol (Surr)	367-12-4	--	--	--	--	30 - 120	--	-- --	--	-- --	--
Nitrobenzene-d5 (Surr)	4165-60-0	--	--	--	--	45 - 120	--	-- --	--	-- --	--
Terphenyl-d14 (Surr)	1718-51-0	--	--	--	--	37 - 144	--	-- --	--	-- --	--
Phenol-d6	13127-88-3	--	--	--	--	35 - 120	--	-- --	--	-- --	--
EPA Method SW8315A											
Formaldehyde	50-00-0	0.432	BCL	10	5	-- --	30	50 - 150	20	50 - 150	20
Polyaromatic Hydrocarbons (µg/L)											
EPA Method SW8270C SIM											
Acenaphthene	83-32-9	2,000	BCL	0.20	0.10	-- --	30	60 - 120	25	60 - 120	20
Acenaphthylene	208-96-8	6.22	BCL	0.20	0.10	-- --	30	60 - 120	25	60 - 120	20
Anthracene	120-12-7	100,000	BCL	0.20	0.10	-- --	30	65 - 120	25	65 - 120	20
Benzo(a)anthracene	56-55-3	0.0328	BCL	0.20	0.10	-- --	30	65 - 120	20	65 - 120	20

TABLE 6. GROUNDWATER ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)[2]	Method Detection Limit (MDL)[2]	QUALITY CONTROL LIMITS[3]					
						Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
Benzo(a)pyrene	50-32-8	0.2	MCL	0.20	0.10	-- --	30	55 - 130	25	55 - 130	25
Benzo(b)fluoranthene	205-99-2	0.0921	BCL	0.20	0.10	-- --	30	55 - 125	25	55 - 125	25
Benzo(g,h,i)perylene	191-24-2	1,000	BCL	0.20	0.10	-- --	30	45 - 135	30	45 - 135	25
Benzo(k)fluoranthene	207-08-9	0.921	BCL	0.20	0.10	-- --	30	55 - 125	30	50 - 125	20
Chrysene	218-01-9	9.21	BCL	0.20	0.10	-- --	30	65 - 120	25	65 - 120	20
Dibenz(a,h)anthracene	53-70-3	0.00921	BCL	0.20	0.10	-- --	30	45 - 135	30	50 - 135	25
Fluoranthene	206-44-0	1,330	BCL	0.20	0.10	-- --	30	60 - 120	25	60 - 120	20
Fluorene	86-73-7	1,330	BCL	0.20	0.10	-- --	30	65 - 120	25	65 - 120	20
Indeno(1,2,3-cd)pyrene	193-39-5	0.0921	BCL	0.20	0.10	-- --	30	40 - 135	30	45 - 135	25
Naphthalene	91-20-3	0.165	BCL	0.20	0.10	-- --	30	55 - 120	25	55 - 120	20
Phenanthrene	85-01-8	6.22	BCL	0.20	0.10	-- --	30	65 - 120	25	65 - 120	20
Pyrene	129-00-0	1,000	BCL	0.20	0.10	-- --	30	55 - 125	25	55 - 125	25
2-Fluorobiphenyl (Surr)	321-60-8	--	--	--	--	50 - 120	--	-- --	--	-- --	--
Nitrobenzene-d5	4165-60-0	--	--	--	--	45 - 120	--	-- --	--	-- --	--
Terphenyl-d14	1718-51-0	--	--	--	--	17 - 100	--	-- --	--	-- --	--
Organophosphorus Pesticides (µg/L)											
EPA Method SW8141A											
Atrazine	1912-24-9	--	--	10.0	0.293	-- --	30	49 - 116	50	49 - 116	50
Bolstar	35400-43-2	--	--	1.0	0.314	-- --	30			61 - 108	
Chlorpyrifos	2921-88-2	33.4	BCL	1.5	0.360	-- --	30	35 - 124	34	35 - 124	34
Coumaphos	56-72-4	--	--	1.0	0.135	-- --	30	39 - 126	43	39 - 126	43
Demeton, Total	8065-48-3	--	--	3.0	0.209	-- --	30	31 - 123	50	31 - 123	50
Diazinon	333-41-5	23.4	BCL	0.5	0.147	-- --	30	46 - 115	40	46 - 115	40
Dichlorvos	62-73-7	0.232	BCL	0.5	0.162	-- --	30	33 - 151	49	33 - 151	49
Dimethoate	60-51-5	44	RSL	1.5	0.449	-- --	30	36 - 127	50	36 - 127	50
Disulfoton	298-04-4	1.33	BCL	1.0	0.322	-- --	30	36 - 115	40	36 - 115	40
EPN	2104-64-5	0.089	RSL	1.2	0.149	-- --	30	54 - 138	50	54 - 138	50
Ethoprop	13194-48-4	--	--	1.5	0.177	-- --	30	51 - 120	36	51 - 120	36
Ethyl Parathion	56-38-2	200	BCL	1.0	0.144	-- --	30	25 - 175	40	25 - 175	40
Famphur	52-85-7	--	--	1.0	0.179	-- --	30	43 - 146	88	43 - 146	88

TABLE 6. GROUNDWATER ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source(1)	Practical Quantitation Limit (PQL)(2)	Method Detection Limit (MDL)(2)	QUALITY CONTROL LIMITS(3) Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike/LCS %R	Blank Spike/LCS RPD
Fensulfothion	115-90-2	--	--	2.5	0.544	-- --	30	36 - 124	62	36 - 124	62
Fenthion	55-38-9	--	--	2.5	0.154	-- --	30	34 - 120	41	34 - 120	41
Malathion	121-75-5	667	BCL	2.0	0.133	-- --	30	41 - 134	28	41 - 134	28
Merphos	150-50-5	0.6	RSL	5.0	0.174	-- --	30	10 - 123	50	10 - 123	50
Methyl parathion	298-00-0	8.34	BCL	4.0	0.141	-- --	30	42 - 130	30	42 - 130	30
Mevinphos	7786-34-7	--	--	6.2	0.460	-- --	30	10 - 229	40	10 - 229	40
Phorate	298-02-2	3	RSL	1.2	0.154	-- --	30	36 - 115	40	36 - 115	40
Ronnel	299-84-3	1,670	BCL	10.0	0.116	-- --	30	33 - 126	39	33 - 126	39
Simazine	122-34-9	--	--	10.0	0.223	-- --	30	27 - 186	31	27 - 186	31
Stirphos (Tetrachlorovinphos)	22248-79-9	--	--	3.5	0.124	-- --	30	27 - 131	40	27 - 131	40
Sulfotepp	3689-24-5	7.1	RSL	1.5	0.168	-- --	30	48 - 123	40	48 - 123	40
Thionazin	297-97-2	--	--	1.0	0.312	-- --	30	48 - 115	40	48 - 115	40
Trichloronate	327-98-0	--	--	1.5	0.242	-- --	30	14 - 118	38	14 - 118	38
Chlormefos (Surr)	24934-91-6	--	--	--	--	49 - 171	--	-- --	--	-- --	--
Triphenylphosphate (Surr)	115-86-6	--	--	--	--	60 - 154	--	-- --	--	-- --	--
Organochlorine Pesticides (µg/L)											
EPA Method SW8081A, SW8081B											
2,4'-DDE	3424-82-6	--	--	0.1	0.02	-- --	30	45 - 125	30	50 - 120	30
4,4'-DDD	72-54-8	0.0631	BCL	0.005	0.004	-- --	30	50 - 125	30	55 - 120	30
4,4'-DDE	72-55-9	0.198	BCL	0.005	0.003	-- --	30	45 - 125	30	50 - 120	30
4,4'-DDT	50-29-3	0.198	BCL	0.01	0.004	-- --	30	50 - 125	30	55 - 120	30
Aldrin	309-00-2	0.000889	BCL	0.005	0.0015	-- --	30	35 - 120	30	40 - 115	30
alpha-BHC	319-84-6	0.0107	BCL	0.005	0.0025	-- --	30	40 - 120	30	45 - 115	30
beta-BHC	319-85-7	0.0374	BCL	0.01	0.004	-- --	30	50 - 120	30	55 - 115	30
delta-BHC	319-86-8	10	BCL	0.005	0.0035	-- --	30	50 - 120	30	55 - 115	30
Dieldrin	60-57-1	0.0042	BCL	0.005	0.002	-- --	30	50 - 120	30	55 - 115	30
Endosulfan I	959-98-8	--	--	0.005	0.003	-- --	30	50 - 120	30	55 - 115	30
Endosulfan II	33213-65-9	--	--	0.005	0.0020	-- --	30	50 - 125	30	55 - 120	30
Endosulfan Sulfate	1031-07-8	--	--	0.01	0.003	-- --	30	55 - 125	30	60 - 120	30
Endrin	72-20-8	2	MCL	0.005	0.0020	-- --	30	50 - 120	30	55 - 115	30

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Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)[2]	Method Detection Limit (MDL)[2]	QUALITY CONTROL LIMITS[3] Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike/LCS %R	Blank Spike/LCS RPD
Endrin aldehyde	7421-93-4	--	--	0.010	0.0020	-- --	30	45 - 125	30	50 - 120	30
Endrin Ketone	53494-70-5	--	--	0.01	0.007	-- --	30	50 - 125	30	55 - 120	30
gamma-BHC	58-89-9	0.2	MCL	0.01	0.003	-- --	30	40 - 120	30	45 - 115	30
gamma-chlordane	57-74-9	2	MCL	0.10	0.080	-- --	30	60 - 140	30	60 - 140	30
Heptachlor	76-44-8	0.4	MCL	0.01	0.003	-- --	30	40 - 120	30	45 - 115	30
Heptachlor epoxide	1024-57-3	0.2	MCL	0.005	0.0025	-- --	30	50 - 120	30	55 - 115	30
Methoxychlor	72-43-5	40	MCL	0.005	0.0035	-- --	30	55 - 125	30	60 - 120	30
Toxaphene	8001-35-2	3	MCL	0.500	0.2500	-- --	30	60 - 140	30	60 - 140	30
DCB Decachlorobiphenyl (Surr)	2051-24-3	--	--	--	--	45 - 120	--	-- --	--	-- --	--
PCBs as Congeners (µg/L)[6]											
EPA Method 1668A											
Total PCBs	1336-36-3	0.5	MCL	0.000002	EDL[5]	-- --	30	-- --	--	-- --	--
3,4,4',5-TeCB (PCB-81)	70362-50-4	0.0004	RSL	0.00000002	EDL[5]	-- --	30	50 - 150	50	50 - 150	50
2,3',4,4',5-PeCB (PCB-118)	31508-00-6	0.004	RSL	0.00000002	EDL[5]	-- --	30	50 - 150	50	50 - 150	50
3,3',4,4',5-PeCB (PCB-126)	57465-28-8	0.0000012	RSL	0.00000002	EDL[5]	-- --	30	50 - 150	50	50 - 150	50
3,3',4,4',5,5'-HxCB (PCB-169)	32774-16-6	0.000004	RSL	0.00000002	EDL[5]	-- --	30	50 - 150	50	50 - 150	50
DeCB (PCB-209)	2051-24-3	0.5	RSL	0.0000002	EDL[5]	-- --	30	50 - 150	50	50 - 150	50
PCBs as Aroclors (µg/L)											
EPA Method SW8082											
Aroclor 1260	11096-82-5	0.00493	BCL	0.500	0.2500	-- --	30	55 - 125	25	60 - 120	25

TABLE 6. GROUNDWATER ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
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Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)[2]	Method Detection Limit (MDL)[2]	QUALITY CONTROL LIMITS[3] Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike/LCS %R	Blank Spike/LCS RPD
Dioxins/Furans (pg/L)[6]											
EPA Method SW8290 or SW8280											
2,3,7,8- TCDD	1746-01-6	30	MCL	10	EDL[5]	-- --	30	72 - 144	20	72 - 144	20
OCDF	39001-02-0	--	--	100	EDL[5]	-- --	30	65 - 145	20	65 - 145	20
OCDD	3268-87-9	--	--	100	EDL[5]	-- --	30	80 - 129	20	80 - 129	20
1,2,3,4,6,7,8-HpCDF	67562-39-4	--	--	50	EDL[5]	-- --	30	81 - 135	20	81 - 135	20
1,2,3,4,6,7,8-HpCDD	35822-46-9	--	--	50	EDL[5]	-- --	30	81 - 132	20	81 - 132	20
1,2,3,4,7,8,9-HpCDF	55673-89-7	--	--	50	EDL[5]	-- --	30	72 - 140	20	72 - 140	20
1,2,3,4,7,8-HxCDF	70648-26-9	--	--	50	EDL[5]	-- --	30	86 - 126	20	86 - 126	20
1,2,3,4,7,8-HxCDD	39227-28-6	--	--	50	EDL[5]	-- --	30	65 - 144	20	65 - 144	20
1,2,3,6,7,8-HxCDF	57117-44-9	--	--	50	EDL[5]	-- --	30	79 - 137	20	79 - 137	20
1,2,3,6,7,8-HxCDD	57653-85-7	--	--	50	EDL[5]	-- --	30	78 - 137	20	78 - 137	20
1,2,3,7,8,9-HxCDF	72918-21-9	--	--	50	EDL[5]	-- --	30	72 - 145	20	72 - 145	20
1,2,3,7,8,9-HxCDD	19408-74-3	--	--	50	EDL[5]	-- --	30	74 - 142	20	74 - 142	20
1,2,3,7,8-PeCDF	57117-41-6	--	--	50	EDL[5]	-- --	30	79 - 137	20	79 - 137	20
1,2,3,7,8-PeCDD	40321-76-4	--	--	50	EDL[5]	-- --	30	79 - 125	20	79 - 125	20
2,3,4,6,7,8-HxCDF	60851-34-5	--	--	50	EDL[5]	-- --	30	80 - 138	20	80 - 138	20
1,2,3,6,7,8-HxCDF	57117-44-9	--	--	50	EDL[5]	-- --	30	79 - 137	20	79 - 137	20
2,3,7,8-TCDF	51207-31-9	--	--	10	EDL[5]	-- --	30	73 - 150	20	73 - 150	20
Organic Acids (µg/L)											
Lab SOP by Liquid Chromatography/Electrospray/Mass SpectrometrySOP No. WS-LC-0013, Rev 3.1											
4-Chlorobenzenesulfonic acid	98-66-8	33,400	BCL	1	0.097	-- --	30	60 - 127	20	60 - 127	20
4-Bromobenzenesulfonic Acid (Surr)	79326-93-5	--	--	--	--	63 - 123	--	-- --	--	-- --	--
EPA Method SW8270C											
Phthalic Acid[7]	88-99-3	66,700	BCL	400	5.84	-- --	30	-- --	--	-- --	--
2-fluorobiphenyl (Surr)	321-60-8	--	--	--	--	29 - 120	--	-- --	--	-- --	--

TABLE 6. GROUNDWATER ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)[2]	Method Detection Limit (MDL)[2]	QUALITY CONTROL LIMITS[3] Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
Total Petroleum Hydrocarbons (mg/L)											
EPA Method SW8015B											
Gasoline Range Organics (C6-C10)	TPH-gasoline	--	--	0.05	0.025	-- --	30	65 - 140	20	80 - 120	20
4-Bromofluorobenzene (Surr)	460-00-4	--	--	--	--	80 - 120	--	-- --	--	-- --	--
Diesel Range Organics (C10-C28)	TPH-diesel	--	--	0.05	0.025	-- --	30	40 - 120	30	40 - 115	25
Oil Range Organics (C29-C40)	TPH-oil	--	--	0.05	0.025	-- --	30	40 - 120	30	40 - 115	25
n-Octacosane (Surr)	630-02-4	--	--	--	--	45 - 120	--	-- --	--	-- --	--
Methane (mg/L)											
Method RSK 175											
Methane (FID)	74-82-8	--	--	0.005	0.000626	-- --	30	-- --	--	80 - 120	20
Methane (TCD)	74-82-8	--	--	1.00	0.500	-- --	30	-- --	--	80 - 120	20
Dissolved Hydrogen (nM)											
Dissolved Hydrogen AM20GAx											
Hydrogen	1333-74-0	--	--	1.90	0.490	-- --	30	-- --	--	80 - 120	20
Others (μg/L)											
SM 2320B											
Alkalinity as $CaCO_3$	ALK_TOT_CACO3	--	--	20000	8450	-- --	30	-- --	--	80 - 120	20
Bicarbonate as HCO_3^-	BICARBHCO3	--	--	20000	8450	-- --	30	-- --	--	-- --	--
Carbonate	3812-32-6	--	--	20000	8450	-- --	30	-- --	--	-- --	--
Hydroxide	14280-30-9	--	--	20000	8450	-- --	30	-- --	--	-- --	--
SM 4500-NH_3 D											
Ammonia	7664-41-7	209	BCL	500	100	-- --	30	75 - 125	15	85 - 115	15
EPA Method 300.0											
Bromide	24959-67-9	--	--	500	250	-- --	30	80 - 120	20	90 - 110	20
Chloride	16887-00-6	250,000	2nd MCL	2000	520	-- --	30	80 - 120	20	90 - 110	20
Fluoride	16984-48-8	4,000	MCL	500	250	-- --	30	80 - 120	20	90 - 110	20

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Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[(1)]	Practical Quantitation Limit (PQL)[(2)]	Method Detection Limit (MDL)[(2)]	QUALITY CONTROL LIMITS[(3)]					
						Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
Nitrate as N	14797-55-8	10,000	MCL	110	55	-- --	30	80 - 120	20	90 - 110	20
Nitrite as N	14797-65-0	1,000	MCL	150	25	-- --	30	80 - 120	20	90 - 110	20
Sulfate	14808-79-8	250,000	2nd MCL	5000	594	-- --	30	80 - 120	20	90 - 110	20
Orthophosphate as PO_4	14265-44-2	--	--	500	250	-- --	30	80 - 120	20	90 - 110	20
EPA Method 300.1B											
Chlorate	7790-93-4	--	--	50	24	-- --	30	75 - 125	25	75 - 125	25
Chlorite	14998-27-7	1000	MCL	50	24	-- --	30	75 - 125	25	85 - 115	25
EPA Method 314.0											
Perchlorate	14797-73-0	23.4	BCL	4	0.95	-- --	30	80 - 120	20	85 - 115	15
EPA Method SW6860											
Perchlorate	14797-73-0	23.4	BCL	0.05	0.004	-- --	30	70 - 130	15	70 - 130	15
SM 2340B											
Hardness as $CaCO_3$	HARD	--	--	0.004	--	-- --	30	-- --	--	-- --	--
EPA Method 351.2											
Total Kjeldahl Nitrogen	7727-37-9	--	--	500	180	-- --	30	90 - 110	20	90 - 110	20
SM 4500-S^{2-} D											
Sulfide	18496-25-8	--	--	50	27	-- --	30	70 - 130	30	80 120	20
Sulfide, Dissolved	18496-25-8	--	--	50	27	-- --	30	70 - 130	30	80 120	20
EPA Method SW9014											
Cyanide	57-12-5	200	MCL	25	12.5	-- --	30	70 - 115	15	90 - 110	10
EPA Method 365.1, EPA Method 365.3, EPA Method 365.4											
Phosphorus	7723-14-0	0.667	BCL	100	35	-- --	30	75 - 125	20	80 - 120	20
SM 5310B											
Total Organic Carbon	7440-44-0	--	--	1000	650	-- --	30	80 - 120	20	90 - 110	20
Dissolved Organic Carbon	7440-44-0	--	--	1000	650	-- --	30	80 - 120	20	90 - 110	20
SM 2510B (µmho/cm)											
Specific Conductance	--	--	--	10.0	--	-- --	50	-- --	--	90 - 110	20
SM 2540C											
Total Dissolved Solids	10-33-3	500,000	2nd MCL	20000	20000	-- --	30	-- --	--	90 - 110	10

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Nevada Environmental Response Trust Site; Henderson, Nevada

ANALYTES	CAS Number	Screening Level	Screening Level Source[1]	Practical Quantitation Limit (PQL)[2]	Method Detection Limit (MDL)[2]	QUALITY CONTROL LIMITS[3]					
						Surrogate	Duplicate	Matrix Spike		Blank Spike/LCS	
						%R	RPD	%R	RPD	%R	RPD
Volatile Fatty Acids (mg/L)											
Lab SOP by Ion Chromatography SOP No. BF-MB-009, Rev 3 or AM 23G											
Acetic acid	64-19-7	--	--	1.00	0.29	-- --	30	80 - 120	20	80 - 120	20
Butyric Acid	107-92-6	--	--	1.00	0.26	-- --	30	80 - 120	20	80 - 120	20
Formic acid	64-18-6	--	--	1.00	0.26	-- --	30	80 - 120	20	80 - 120	20
Hexanoic acid	142-62-1	--	--	1.00	0.37		30	80 - 120	20	80 - 120	20
Lactic acid	50-21-5	--	--	1.00	0.31	-- --	30	80 - 120	20	80 - 120	20
Pentanoic acid	109-52-4	--	--	1.00	0.37		30	80 - 120	20	80 - 120	20
Propionic acid	79-09-4	--	--	1.00	0.35	-- --	30	80 - 120	20	80 - 120	20
Pyruvic Acid	127-17-3	--	--	1.50	0.37	-- --	30	80 - 120	20	80 - 120	20
i-Hexanoic acid	646-07-1	--	--	1.00	0.37		30	80 - 120	20	80 - 120	20
i-Pentanoic acid	503-74-2	--	--	1.00	0.37	-- --	30	80 - 120	20	80 - 120	20
Radionuclides (pCi/L)											
See Table 1 for Individual Methods											
Radium-226	13982-63-3	5[8]	BCL	1.00	--	-- --	30	75 - 138	40	68 - 137	40
Radium-228	15262-20-1	5[8]	BCL	1.00	--	-- --	30	45 - 150	40	56 - 140	40
Thorium-228	14274-82-9	0.11	Other	1.00	--	-- --	30	70 - 130	40	70 - 130	40
Thorium-230	14269-63-7	0.042	Other	1.00	--	-- --	30	82 - 139	40	81 - 125	40
Thorium-232	7440-29-1	0.14	Other	1.00	--	-- --	30	70 - 130	40	70 - 130	40
Uranium-234	13966-29-5	187,000	Other	1.00	--	-- --	30	65 - 146	40	84 - 120	40
Uranium-235	15117-96-1	64.8	Other	1.00	--	-- --	30	-- --	40	-- --	40
Uranium-238	7440-61-1	10.1	Other	1.00	--	-- --	30	68 - 143	40	83 - 121	40

Notes:

Shaded PQLs and MDLs exceed the lowest screening criteria.

-- = no value

mg/L = milligrams per liter
µg/L = micrograms per liter
µmho/cm = micro mho per centimeter

TABLE 6. GROUNDWATER ANALYTES AND ANALYTICAL PERFORMANCE CRITERIA
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

Notes:
nM = Nanomolar
pCi/L = picoCurie per liter
pg/L = picogram per liter
FID = flame ionization detector
TCD = thermal conductivity detector

(1) Groundwater screening levels were selected according to the following hierarchy of criteria:
(a) Maximum Contaminant Level (MCL): Primary United States Environmental Protections Agency (USEPA) maximum contaminant level (USEPA 40 CFR Part 141).
(b) Basic Contaminant Level (BCL): Residential water basic comparison levels in NDEP August 2013 BCL Spreadsheet (NDEP 2013).
(c) Regional Screening Level (RSL): Tap water regional screening levels in USEPA Pacific Southwest, Region 9, Regional Screening Levels Chemical Specific Parameters table, Nov 2013. The screening levels were selected as the minimal values of carcinogenic screening level and noncarcinogenic screening level (USEPA 2013a).
(d) 2nd Maximum Contaminant Level (2nd MCL): National Secondary Drinking Water Regulations (USEPA, 40 CFR Part 143).
(e) Other criteria for radionuclides, including target activities for radium and thorium isotopes (NDEP, 2009) and for uranium isotopes (USEPA 2013b).

(2) PQLs and MDLs were derived from reviewing reporting limits and detection limits generally achieved by the laboratories that will be used to implement the QAPP. Actual limits reported by the laboratories may be lower based on laboratory location. Reporting limits are also sample dependent and may not be achievable due to matrix, necessary dilutions, and/or interferences.

(3) QC Limits = Quality Control Limits for %R (Percent Recovery) of spiked compounds in Laboratory Control Samples (LCS) and surrogate compounds and Relative Percent Difference (RPD) between Matrix Spike (MS) and MS Duplicate (MSD) samples and LCS and LCS duplicate (LCSD) samples. Laboratory historical control limits are subject to change as a result of periodic re-evaluation. Limits in use at the time of sample analysis are available from the laboratory. Duplicate RPDs apply to sample duplicates and field duplicates.

(4) According to the laboratory's standard operating procedure (SOP) Arsenate (Arsenic V) is determined by calculating the difference between Total Inorganic Arsenic and Arsenic III.

(5) EDL = Estimated Detection Limit. For each dioxin, furan, or PCB not detected, an EDL is calculated. The sample specific EDL is an estimate made by the laboratory of the concentration of a given chemical that would have to be present to produce a signal with a peak height of at least 2.5 times the background signal level. The estimate is specific to a particular analysis of the sample and will be affected by sample size, dilution, and so forth. Because of the toxicological significance of dioxins, the EDL value is reported for non-detected chemicals rather than reporting the MDL.

(6) Dioxins and PCB congeners shall be reported to the estimated detection limit (EDL). Dioxin toxicity equivalents (TEQ) will be calculated for the 16 dioxin and furan congeners and 12 PCB congeners with toxicity equivalent factors (TEFs) defined by the World Health Organization (Van den Berg et al. 2006) substituting half of the EDL for the congeners not detected.

(7) Phthalic acid will be run with the other SVOCs by EPA Method 8270C.

(8) The screening level listed for Radium-226 and Radium-228 is the BCL for a combination of Radium-226 and Radium-228.

Sources:

NDEP. 2009b. Guidance for Evaluating Radionuclide Data, BMI Plant Sites and Common Areas Projects, Henderson, Nevada. February 6.

NDEP. 2013. User's Guide and Background Technical Document for NDEP Basic Comparison Levels (BCLs) for Human Health for the BMI Complex and Common Areas. Revision 12, August.

USEPA. 2013a. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. November.

USEPA. 2013b. Preliminary Remediation Goals for Radionuclides. On-line calculator. http://epa-prgs.ornl.gov/cgi-bin/radionuclides/rprg_search

USEPA. National Primary Drinking Water Regulations. Code of Federal Regulations, 40 CFR Part 141.

USEPA. National Secondary Drinking Water Regulations. Code of Federal Regulations, 40 CFR Part 143.

Van den Berg et al., 2006. The 2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds. May

TABLE 7. FREQUENCY OF QA/QC SAMPLES
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

SAMPLE TYPE	FREQUENCY OF ANALYSIS
Contamination Control Samples	
Laboratory Method Blank	One per each analytical method. One in every batch of samples (not to exceed 20 samples).
Trip Blank	One per cooler/shipment if VOCs are tested; analyze for VOCs only.
Equipment Blank	One per each analytical method. One per every 20 field samples collected. EBs will not be collected when dedicated single-use equipment is used for sample collection (e.g., new bailers and filters used to collect grab groundwater samples at boring locations).
Field Blank	One per each analytical method. One per every 20 field samples collected. FBs will not be collected from soil boring locations.
Accuracy Control Samples	
Laboratory Control Samples	One per each analytical method. One in every preparation batch (not to exceed 20 samples).
Surrogate Spiked Samples(1)	For methods that use surrogate(s), the surrogate(s) will be spiked and analyzed in all samples and in all blanks.
Matrix Spike Samples(2)	Analyzed in each batch, where applicable to the method (not to exceed 20 samples).
Precision Control Samples	
Field Duplicate Sample	One per each analytical method. One per every 10 field samples collected.
Laboratory Control Sample Duplicates	One per each analytical method. One in every preparation batch (not to exceed 20 samples).
Matrix Spike Duplicate Samples(2)	Analyzed in each batch, where applicable to the method (not to exceed 20 samples).

NOTE:

(1) Not all methods use surrogates. See Tables 2, 3, 4, and 5 for specific surrogates to be used.

(2) Not all analytical methods or sample matrices have Matrix Spikes.

TABLE 8. SAMPLE PRESERVATION, CONTAINERS, AND HOLDING TIMES
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

MATRIX	ANALYTES	ANALYTICAL METHOD	PRESERVATION	CONTAINER(1)(2)	TAT	HOLD TIME(3)	
						Prior to Extraction	After Extraction
Water	Metals	EPA Method 200.7 / SW6010B, SW6010C	HNO_3 to pH <2	500 mL HDPE	10d	182d	
Water	Metals	EPA Method 200.8 / SW6020	HNO_3 to pH <2	500 mL HDPE	10d	180d	
Water	Rare Earth Metals(4)	EPA Method SW6020A	HNO_3 to pH <2; ≤6 °C	500 mL HDPE	11d	180d	
Water	Arsenic III/V	EPA Method 1632A	Cool to ≤6 °C	1L glass with Teflon-lined septum caps	10d	14d	40d
Water	Mercury	EPA Method SW7470A	HNO_3 to pH <2	500 mL HDPE	10d	28d	
Water	Hexavalent chromium	EPA Method 218.6	Cool to ≤6 °C	125 mL HDPE	10d	24-hr	
Water	Volatile Organic Compounds (VOCs)	EPA Method 8260B and 8260B SIM	HCl to pH <2; no headspace; cool to ≤6 °C	3 x 40 mL glass vials with Teflon-lined septum caps	10d	14d	
Water	Semivolatile Organic Compounds (SVOCs) and Phthalic Acid	EPA Method SW8270C, SW8270D	Cool to ≤6 °C	2 x 1 L amber glass with Teflon-lined lids	10d	7d	40d
Water	Formaldehyde	EPA Method SW8315A	Cool to ≤6 °C	1 x 1 L amber glass with Teflon-lined lids	10d	3d	3d
Water	Polyaromatic Hydrocarbons (PAHs)	EPA Method SW8270C SIM	Cool to ≤6 °C	2 x 1 L amber glass with Teflon-lined lids	10d	7d	40d
Water	Organophosphorus Pesticides	EPA Method SW8141A	Cool to ≤6 °C	2 x 1 L amber glass with Teflon-lined lids	11d	7d	40d
Water	Organochlorine Pesticides	EPA Method SW8081A, SW8081B	Cool to ≤6 °C	2 x 1 L amber glass with Teflon-lined lids	10d	7d	40d
Water	PCBs as Congeners	EPA Method 1668A	Cool to ≤6 °C	2 x 1 L amber glass with Teflon-lined lids	20d	1y	45d(7)
Water	PCBs as Aroclors	EPA Method SW8082	Cool to ≤6 °C	2 x 1 L amber glass with Teflon-lined lids	10d	7d	40d
Water	4-chlorobenzenesulfonic acid (p-CBSA)	Lab SOP by Liquid Chromatography/ Electrospray/Mass Spectrometry SOP No. WS-LC-0013, Rev 3.1	Cool to ≤6 °C	2 x 1 L amber glass with Teflon-lined lids	10d	7d	40d
Water	Volatile Fatty Acids	Lab SOP by Ion Chromatography SOP No. BF-MB-009, Rev 5	Cool to ≤6 °C	2 x 100 mL amber glass with Teflon-lined lids	10d	28d	

TABLE 8. SAMPLE PRESERVATION, CONTAINERS, AND HOLDING TIMES
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

MATRIX	ANALYTES	ANALYTICAL METHOD	PRESERVATION	CONTAINER(1)(2)	TAT	HOLD TIME(3) Prior to Extraction	HOLD TIME(3) After Extraction
Water	Gasoline Range Organics (GROs)	EPA Method SW8015B	HCl to pH <2; no headspace; cool to ≤6 °C	3 x 40 mL glass vials with Teflon-lined septum caps	10d	14d	
Water	Diesel/Oil Range Organics (DROs/OROs)	EPA Method SW8015B	Cool to ≤6 °C	2 x 1 L amber glass with Teflon-lined lids	10d	7d	40d
Water	Methane	Method RSK 175	HCl to pH <2; no headspace; cool to ≤6 °C	3 x 40 mL glass vials with Butyl Rubber Teflon-lined septum caps	10d	14d	
Water	Dissolved Hydrogen	AM20GAx; Sample collected by "Bubble Strip" Method	Cool to ≤6 °C	40 mL amber glass vials with Teflon-lined septum caps	10d	14d	
Water	Alkalinity and Carbonate	SM 2320B	Cool to ≤6 °C	500 mL HDPE	10d	14d	
Water	Ammonia	SM 4500-NH3 D	H_2SO_4 to pH <2; ≤6 °C	500 mL HDPE	10d	28d	
Water	Inorganic anions(5)	EPA Method 300.0	Cool to ≤6 °C	500 mL HDPE	10d	28d or 48h(6)	
Water	Chlorate	EPA Method 300.1B	EDA; ≤6 °C	500 mL HDPE	10d	28d	
Water	Perchlorate	EPA Method 314.0	Cool to ≤6 °C	500 mL HDPE	10d	28d	
Water	Perchlorate	EPA Method 6860	Cool to ≤6 °C	500 mL HDPE	10d	28d	28d
Water	Hardness	SM 2340B	HNO_3 to pH <2; ≤6 °C	500 mL HDPE	10d	180d	
Water	Total Kjeldahl Nitrogen	EPA Method 351.2	H_2SO_4 to pH <2; ≤6 °C	500 mL HDPE	10d	28d	
Water	Cyanide	EPA Method SW9014	NaOH to pH >12; ≤6 °C	1 x 1L HDPE	10d	14d	
Water	Phosphorus	EPA Method 365.1, 365.3, 365.4	H_2SO_4 to pH <2; ≤6 °C	500 mL HDPE	10d	28d	
Water	Sulfide	SM 4500-S^{2-} D	4 drops of $2NZn(C_2H_3O_2)_2$ and NaOH to pH >9; cool to ≤6°C	500 mL HDPE	10d	7d	
Water	Total Dissolved Solids (TDS)	SM 2540C	Cool to ≤6 °C	500 mL HDPE	10d	7d	
Water	Total and/or Dissolved Organic Carbon	SM 5310B	HCl to pH <2; cool to ≤6 °C	1 x 1 L amber glass with Teflon-lined lids	10d	28d	
Water	Radium 226	EPA Method 903.0	None	2 x 1 L HDPE	22d	180d	
Water	Radium 228	EPA Method 904.0	None	2 x 1 L HDPE	22d	180d	
Water	Thorium 228, 230, 232 and Uranium 234, 235, and 238	DOE EML HASL 300 A-01-R (alpha spectroscopy)	None	500 mL HDPE	22d	180d	
Soil	Metals	EPA Method SW6010B, SW6010C	Cool to ≤6 °C	1 X 4 oz glass jar with Teflon-lined cap	10d	180d	

TABLE 8. SAMPLE PRESERVATION, CONTAINERS, AND HOLDING TIMES
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

MATRIX	ANALYTES	ANALYTICAL METHOD	PRESERVATION	CONTAINER(1)(2)	TAT	HOLD TIME(3)	
						Prior to Extraction	After Extraction
Soil	Metals	EPA Method SW6020	Cool to ≤6 °C	1 X 4 oz glass jar with Teflon-lined cap	10d	180d	
Soil	Rare Earth Metals(4)	EPA Method SW6020A	Cool to ≤6 °C	1 X 2 oz glass jar with Teflon-lined cap	11d	180d	
Soil	Hexavalent chromium	EPA Method SW7199	Cool to ≤6 °C	1 X 4 oz glass jar with Teflon-lined cap	10d	30d to digestion; 7d from digestion to analysis	
Soil	Mercury	EPA Method SW7471A	Cool to ≤6 °C	1 X 4 oz glass jar with Teflon-lined cap	10d	28d	
Soil	Volatile Organic Compounds (VOCs)	EPA Method 8260B and 8260B SIM	Cool to ≤6 °C	Preserved in Accordance with EPA Method 5035 (3x 40 mL glass vials w/ H_2O, 1x 40mL glass vial w/ MeOH)	10d	Frozen or preserved within 48h of collection, 14d from preservation to analysis	
Soil	Semivolatile Organic Compounds (SVOCs)	EPA Method SW8270C, SW8270D	Cool to ≤6 °C	1 X 8 oz glass jar with Teflon-lined cap	10d	14d	40d
Soil	Formaldehyde	EPA Method SW8315A	Cool to ≤6 °C	1 X 8 oz glass jar with Teflon-lined cap	10d	7d	3d
Soil	Polyaromatic Hydrocarbons (PAHs)	EPA Method SW8270C SIM	Cool to ≤6 °C	1 X 8 oz glass jar with Teflon-lined cap	10d	14d	40d
Soil	Organophosphorus Pesticides	EPA Method SW8141A	Cool to ≤6 °C	1 X 8 oz glass jar with Teflon-lined cap	10d	14d	40d
Soil	Organochlorine Pesticides	EPA Method SW8081A, SW8081B	Cool to ≤6 °C	1 X 8 oz glass jar with Teflon-lined cap	10d	14d	40d
Soil	PCBs as Congeners	EPA Method 1668A	≤6 °C, from field, lab storage < -10 °C	1 X 8 oz glass jar with Teflon-lined cap	20d	1y	45d(8)
Soil	PCBs as Aroclors	EPA Method SW8082	Cool to ≤6 °C	1 X 8 oz glass jar with Teflon-lined cap	10d	14d	40d
Soil	Dioxins/Furans	EPA Method SW8290 or SW8280A(7)	Cool to ≤6 °C	1 X 8 oz glass jar with Teflon-lined cap	15d	30d(8)	45d(8)
Soil	Gasoline Range Organics (GROs)	EPA Method SW8015B	Cool to ≤6 °C	Preserved in Accordance with EPA Method 5035	10d	Frozen or preserved within 48h of collection, 14d from preservation to analysis	
Soil	Diesel/Oil Range Organics (DROs/OROs)	EPA Method SW8015B	Cool to ≤6 °C	1 X 8 oz glass jar with Teflon-lined cap	10d	14d	40d

TABLE 8. SAMPLE PRESERVATION, CONTAINERS, AND HOLDING TIMES
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

MATRIX	ANALYTES	ANALYTICAL METHOD	PRESERVATION	CONTAINER(1)(2)	TAT	HOLD TIME(3) Prior to Extraction	HOLD TIME(3) After Extraction
Soil	Alkalinity and Carbonate	SM 2320B	Cool to ≤6 °C	1 X 4 oz glass jar with Teflon-lined cap	10d	None for soil. Use water holding time for leachates.	
Soil	Ammonia	SM 4500-NH3 D	Cool to ≤6 °C	1 X 4 oz glass jar with Teflon-lined cap	10d	None for soil. Use water holding time for leachates.	
Soil	Inorganic Anions(5)	EPA Method SW9056A, 300.0	Cool to ≤6 °C	1 X 4 oz glass jar with Teflon-lined cap	10d	None for soil. Use water holding time for leachates.	
Soil	Chlorate	EPA Method 300.1B	Cool to ≤6 °C	1 X 4 oz glass jar with Teflon-lined cap	10d	None for soil. Use water holding time for leachates.	
Soil	Perchlorate	EPA Method 314.0	Cool to ≤6 °C	1 X 4 oz glass jar with Teflon-lined cap	10d	28d	
Soil	Perchlorate	EPA Method 6860	Cool to ≤6 °C	1 X 4 oz glass jar with Teflon-lined cap	10d	28d	
Soil	Cyanide	EPA Method SW9014	Cool to ≤6 °C	1 X 4 oz glass jar with Teflon-lined cap	10d	14d	
Soil	pH	EPA Method SW9045D	Cool to ≤6 °C	1 X 4 oz glass jar with Teflon-lined cap	10d	Immediate	
Soil	Specific Conductance	SM 2510B	Cool to ≤6 °C	1 X 4 oz glass jar with Teflon-lined cap	10d	28d	
Soil	Surfactants	SM 5540C	Cool to ≤6 °C	1 X 4 oz glass jar with Teflon-lined cap	10d	None for soil. Use water holding time for leachates.	
Soil	Total and Dissolved Organic Carbon	Lloyd Kahn	Cool to ≤6 °C	1 X 4 oz glass jar with Teflon-lined cap	10d	28d	
Soil	Radium 226	EPA Method 903.0	None	1 X 500 mL HDPE	22d	180d	
Soil	Radium 228	EPA Method 904.0	None	1 X 500 mL HDPE	22d	180d	
Soil	Thorium 228, 230, 232 and Uranium 234, 235, and 238	DOE EML HASL 300 A-01-R (alpha spectroscopy)	None	1 X 50 mL HDPE	22d	180d	
Soil	Asbestos	EPA Method 540-R-97-028 modified per Berman & Kolk (2000)	None	1 X 250 mL glass with Teflon-lined cap	30d	None established for soil.	

TABLE 8. SAMPLE PRESERVATION, CONTAINERS, AND HOLDING TIMES
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

MATRIX	ANALYTES	ANALYTICAL METHOD	PRESERVATION	CONTAINER(1)(2)	TAT	HOLD TIME(3)	
						Prior to Extraction	After Extraction
Soil Gas	Volatile Organic Compounds (VOCs)	EPA Method TO-15 and TO-15 SIM	None	SUMMA canister	5d	30d	
Soil Gas	Helium	ASTM D1946	None	SUMMA canister	5d	30d	

Notes:

ASTM = American Society for Testing and Materials
DOE = Department of Energy
HDPE = high-density polyethylene
HASL = Health and Safety Laboratory
EML = Environmental Measurements Laboratory
EPA = United States Environmental Protection Agency
SIM = Single Ion Monitoring
SM = Standard Method
TAT = Turnaround Time

EDA = Ethylene Diamine
HCL = Hydrochloric Acid
H_2SO_4 = Sulfuric Acid
HNO_3 = Nitric Acid
NaOH = Sodium Hydroxide

d = day(s)
h = hours
mL = milliliters
L = liter
oz = ounces
y = year

(1) Additional volume will be collected for MS/MSD samples.
(2) Laboratory may provide alternate containers as long as the containers meet the requirements of the method and allow the collection of sufficient volume to perform the analysis.
(3) Holding time begins from date of sample collection. Leachate holding times must conform to water holding time or the requirements of EPA Method 1312.
(4) Niobium, palladium, sulfur and/or total uranium.
(5) Fluoride, chloride, bromide, sulfate, ortho-phosphate as PO_4, nitrite, and nitrate.
(6) 28 days for fluoride, chloride, bromide, and sulfate; 48 hours for nitrate, nitrate, and orthophosphate.
(7) With proper storage, hold times for unextracted and extracted PCBs and dioxins/furans can be extended to one year. The hold times listed here correspond to those listed in the laboratory's standard operating procedure (SOP).

Immediate means within 15 minutes from sampling or field test.

TABLE 9. CALIBRATION AND MAINTENANCE OF FIELD EQUIPMENT
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

INSTRUMENT	TASK	FREQUENCY
Organic Vapor Meter(1)	(a) Inspect and calibrate (b) Charge batteries	(a) Daily (b) Each night prior to operation
Particulate monitor(2)	(a) Inspect and calibrate (b) Charge batteries	(a) Daily (b) Each night prior to operation
Asbestos monitor(3)	(a) Inspect and calibrate (b) Charge batteries	(a) Daily (b) Each night prior to operation
Conductivity, Dissolved Oxygen, Oxygen Reduction Potential, pH, and Temperature Meter(4)	(a) Inspect and calibrate (b) Charge batteries	(a) Daily (b) Each night prior to operation
Turbidity Meter(5)	(a) Inspect and calibrate (b) Test batteries	(a) Daily (b) Each night prior to operation
Alkalinity Test Kit(6)	(a) Inspect kit integrity (b) Perform accuracy check	(a) Daily prior to testing (b) Before using for first time
Ferrous Iron Test Kit(7)	(a) Inspect kit integrity	(a) Daily prior to testing
Sulfide Test Kit(8)	(a) Inspect kit integrity	(a) Daily prior to testing
Water Level Indicator(9)	(a) Inspect (b) Test batteries (c) Calibrate	(a) Daily (b) Each night prior to operation (c) Annually with steel tape
Low flow adjustable-rate sampling pump(10)	(a) Change bladder (b) Change tubing(11)	(a) Each sample location (b) Each sample location
Low flow adjustable-rate sampling pump	(a) Inspect (b) Calibrate	(a) Individually prior to operation (b) Factory calibrated prior to shipment to site
Pressure Transducers(12)	(a) Inspect data log (b) Check batteries and o-rings (c) Perform depth and drift tests (d) Calibrate	(a) Daily (b) Prior to installation (c) Prior to installation (d) Factory calibrated prior to shipment to site

Notes:

(1) MiniRAE 2000 Photoionization Detector with 10.6 eV lamp or similar

(2) DataRAM pDR-1000AN or similar

(3) Gilian BDX II Personal Abatement Air Sampler or similar

(4) YSI 556 MPS or similar

(5) HACH 2100P Turbidity Meter or similar

(6) HACH Digital Titrator or similar

(7) HACH, CHEMetrics, or similar. Method based on ASTM D 1068-77.

(8) HACH, CHEMetrics, or similar. Method based on USEPA Method 376.2 and Standard Method 4500-S^{2-}D.

(9) Solinst Water Level Indicator or similar having gradations marked at 0.01-foot intervals.

(10) QED Sample Pro or similar

(11) Teflon® or Teflon®-lined

(12) In-Situ Level Troll 500 vented water level/temperature monitor or similar

TABLE 10. ANALYTICAL LABORATORY CALIBRATION FREQUENCIES
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

Laboratory Analysis	Instrumentation	QUALITY CONTROL CHECK(1) Initial Calibration Type/Frequency	Continuing Calibration Verification Type/Frequency
Volatile Organic Compounds (VOCs) by EPA 8260B	Gas Chromatography/ Mass Spectrometry	Minimum five points on an as-needed basis with daily verification before sample analysis.	Analyze a CCV standard at the beginning of each 12-hour analytical shift before any samples are analyzed.
Semivolatile Organic Compounds (SVOCs) by EPA Method 8270C, 8270D	Gas Chromatography/ Mass Spectrometry	Minimum five points on an as-needed basis with daily verification before sample analysis.	Analyze a CCV standard at the beginning of each 12-hour analytical shift before any samples are analyzed.
Organochlorine Pesticides by EPA Method 8081A, 8081B	Gas Chromatography	Minimum five point calibration prior to analysis.	Standard analyzed prior to each 12-hour shift, at least once every 20 samples, and at the end of the sequence.
PCBs as Aroclors by EPA Method 8082	Gas Chromatography	Minimum five point calibration on an as-needed basis with daily verification before sample analysis.	Standard analyzed prior to each 12-hour shift, at least once every 20 samples, and at the end of the sequence.
Gasoline Range Organics by EPA Method 8015B	Gas Chromatography	Minimum five point calibration prior to analysis.	Standard analyzed after every 10 sample-injections or 12 hours, which ever is sooner and at the end of the sequence.
Diesel Range Organics by EPA Method 8015B	Gas Chromatography	Minimum five point calibration prior to analysis.	Standard analyzed prior to each 12-hour shift, at least once every 20 samples, and at the end of the sequence.
Metals by EPA Method 6010B, 6010C	Inductively Coupled Plasma Atomic Emission Spectrometry	Minimum two point and a blank calibration daily prior to analysis.	Standard analyzed at a minimum after every 10 samples and end of the sequence.
Metals by EPA Method 6020	Inductively Coupled Plasma/ Mass Spectrometry	Four point (three standard + blank) calibration daily prior to analysis.	Standard analyzed after every 10 samples.
Rare Earth Metals by EPA Method 6020A	Inductively Coupled Plasma/ Mass Spectrometry	Four point (three standard + blank) calibration daily prior to analysis.	Standard analyzed after every 10 samples.
PCBs as Congeners by EPA Method 1668A	High-Resolution Gas Chromatography/High-Resolution Mass Spectrometry	Minimum five point calibration prior to analysis.	Standard analyzed at the beginning of and after each 12-hour shift.
Organophosphorus Pesticides by EPA Method 8141A	Gas Chromatography	Minimum five point calibration prior to analysis.	Standard analyzed at the beginning of and after each 12-hour shift.
Dioxins/Furans by EPA Method 8290	High-Resolution Gas Chromatography/High-Resolution Mass Spectrometry	Minimum five point calibration prior to analysis.	Standard analyzed at the beginning of and after each 12-hour shift.
Mercury by EPA Method 7471A and 7470A	Cold-Vapor Atomic Absorption Spectroscopy	Minimum three points plus a blank daily prior to analysis	Standard analyzed after every 10 samples and end of the sequence.
Inorganic Anions by EPA Method 300.0 and 300.1	Ion Chromatography	Minimum three points plus a blank on an as needed basis with daily verification before sample analysis.	Standard analyzed after every 10 samples and end of sequence.
Hexavalent Chromium by EPA Method 7199	Ion Chromatography	Minimum three points plus a blank on an as needed basis with daily verification before sample analysis.	Standard analyzed at least once every 10 samples and end of the sequence.

		QUALITY CONTROL CHECK[1]	
Laboratory Analysis	**Instrumentation**	**Initial Calibration Type/Frequency**	**Continuing Calibration Verification Type/Frequency**
Perchlorate by EPA Method 314.0	Ion Chromatography	Minimum five points plus a blank on an as needed basis with daily verification before sample analysis.	Standard analyzed after every 10 samples and end of the sequence.
Perchlorate by EPA Method 6860	Ion Chromatography/Mass Spectrometry/Mass Spectrometry	Minimum six point calibration prior to analysis.	Standard analyzed at beginning of the sequence (if ICAL not performed), after every 10 samples, and end of the sequence.
Volatile Fatty Acids by Lab SOP by Ion Chromatography	Ion Chromatography	Minimum five points plus a blank at a minimum of once every six months.	Standard analyzed at least once every 10 samples and end of the sequence.
Total Kjeldahl Nitrogen by EPA Method 351.2	Spectrophotometry	Minimum three points plus a blank on an as needed basis with daily verification before sample analysis.	Standard analyzed at least once every 10 samples and end of the sequence.
Surfactants by SM 5540C	Spectrophotometry	Minimum five points plus a blank on an as needed basis with daily verification before sample analysis.	Standard analyzed at least once every 10 samples and end of the sequence.
Phosphorus by EPA Method 365.1, 365.3, and 365.4	Spectrophotometry	Minimum three points plus a blank on an as needed basis with daily verification before sample analysis.	Standard analyzed at least once every 10 samples and end of the sequence.
Cyanide by EPA Method 9014B	Spectrophotometry	Minimum three points plus a blank on an as needed basis with daily verification before sample analysis.	Standard analyzed at least once every 10 samples and end of the sequence.
Sulfide by EPA Method 4500-S^{2-} D	Spectrophotometry	Minimum six points plus a blank on an as needed basis with daily verification before sample analysis.	Standard analyzed at least once every 10 samples and end of the sequence.
Alkalinity by SM 2320B	Titration	Minimum three points on an as needed basis with daily verification before sample analysis.	Standard analyzed at least once every 10 samples and end of the sequence.
4-chlorobenzenesulfonic acid by EPA 8321A	Liquid Chromatography/ Electrospray/Mass Spectrometry	Minimum five point calibration daily prior to analysis.	Standard analyzed at the beginning of and after each 12-hour shift.
Formaldehyde by EPA Method 8315A	High-Performance Liquid Chromatography- Ultraviolet Detection	Minimum five point calibration daily prior to analysis.	Standard analyzed at least once every 10 samples, not to exceed 12 hours, and end of the sequence.
Specific Conductance by EPA Method 120.1/SM 2510B	Conductivity Bridge with platinum electrode	Two point calibration daily prior to analysis	Standard analyzed after every 10 samples and end of the sequence.
Ammonia by SM 4500-NH_3	Determined Potentiometrically with an Ion Selective Ammonia Electrode	Minimum five points plus a blank on an as needed basis with daily verification before sample analysis.	Standard analyzed at least once every 10 samples and end of the sequence.
Total Organic Carbon and Dissolved Organic Carbon by SM 5310B	Non-Dispersive Infrared Analyzer	Minimum three points plus a blank on an as needed basis with daily verification before sample analysis.	Standard analyzed daily.
pH by EPA Method 9045C	Electrometric	Standard analyzed on an as needed basis with daily verification before sample analysis.	Standard analyzed after every 10 samples and end of the sequence.

TABLE 10. ANALYTICAL LABORATORY CALIBRATION FREQUENCIES
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

		QUALITY CONTROL CHECK[1]	
Laboratory Analysis	**Instrumentation**	**Initial Calibration Type/Frequency**	**Continuing Calibration Verification Type/Frequency**
Radium 226 by EPA Method 903.0	Gamma Spectroscopy	Annual calibration against standards with daily verification before sample analysis.	Source standard analyzed daily.
Radium 228 by EPA Method 904.0	Gamma Spectroscopy	Annual calibration against standards with daily verification before sample analysis.	Source standard analyzed daily.
Uranium 234, 235, 238, and Thorium 228, 230, 232 by Method HASL 300 modified	Alpha Spectroscopy	Annual calibration against standards with daily verification before sample analysis.	Source standard analyzed daily.

Notes:

ASTM = American Society for Testing and Materials

EPA = United States Environmental Protection Agency

HASL = Health and Safety Laboratory

SM = Standard Method

(1) These Quality Control checks are to be considered the minimum frequency and scope of checks and calibrations to be performed. Laboratories may have more stringent requirements as part of their Standard Operating Procedures.

TABLE 11. DATA VALIDATION QUALIFIERS AND REASON CODES
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

Data Validation Qualifiers for Organics

Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
NJ	The analyte has been “tentatively identified” or “presumptively” as present and the associated numerical value is the estimated concentration in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
C	The target Pesticide or Aroclor analyte identification has been confirmed by Gas Chromatography/Mass Spectrometry (GC/MS).
X	The target Pesticide or Aroclor analyte identification was not confirmed when GC/MS analysis was performed.

Data Validation Qualifiers for Inorganics

Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

Data Validation Reason Codes

Reason	Explanation
a	qualified due to low abundance (radiochemical activity)
ba	blank contamination above PQL
bb	blank contamination below PQL
be	qualified due to equipment blank contamination
bf	qualified due to field blank contamination
bl	qualified due to lab blank contamination
bt	qualified due to trip blank contamination
bp	qualified due to pump blank contamination (wells w/o dedicated pumps, when contamination is detected in the Pump Blk)
br	qualified due to filter blank contamination (aqueous Hexavalent Chromium and Dissolved sample fractions)
brr	better result reported
c	qualified due to calibration problems
cp	qualified due to insufficient ingrowth (radiochemical only)
dc	duel column confirmation %D exceeded
e	concentration exceeded the calibration range

TABLE 11. DATA VALIDATION QUALIFIERS AND REASON CODES
QUALITY ASSURANCE PROJECT PLAN
Nevada Environmental Response Trust Site; Henderson, Nevada

Data Validation Reason Codes

Reason	Explanation
fd	qualified due to field duplicate imprecision
h	qualified due to holding time exceedance
i	qualified due to internal standard areas
k	qualified as Estimated Maximum Possible Concentrations (dioxins and PCB congeners)
l	qualified due to LCS recoveries
ld	qualified due to lab duplicate imprecision (matrix duplicate, MSD, LCSD)
m	qualified due to matrix spike recoveries
nb	qualified due to negative lab blank contamination (nondetect results only)
nd	qualified due to non-detected target analyte
o	other
orr	other result reported
p	qualified due to quantitation during shipping
pH	sample preservation not within acceptance range
q	qualified due to quantitation problem
s	qualified due to surrogate recoveries
sd	serial dilution did not meet control criteria
sp	detected value report >SQL <PQL
st	sample receipt temperature exceeded
t	qualified due to elevated helium tracer concentrations
vh	volatile headspace detected in aqueous sample containers submitted for VOC analysis
x	qualified due to low % solids
z	qualified due to ICS results

Sources:
USEPA. 2017. National Functional Guidelines for Inorganic Superfund Methods Data Review. OLEM 9355.0-135. EPA-540-R-2017-001. January.
USEPA. 2017. National Functional Guidelines for Organic Superfund Methods Data Review. OLEM 9355.0-136. EPA-540-R-2017-002. January.

APPENDIX A
PROJECT ORGANIZATION/ROLES AND RESPONSIBILITIES

Appendix A. QAPP Project Organization/Roles and Responsibilities

Organization	Name	Project Role/Title
Nevada Division of Environmental Protection	Weiquan Dong, PhD	NDEP Remedial Project Manager
Nevada Environmental Response Trust	Steve Clough, PG, CEM	NERT Remediation Director
Ramboll	John M. Pekala, PG, CEM	Project Manager
Ramboll	Christopher M. Stubbs, PhD, PE	Project Quality Assurance/Quality Control Officer
Ramboll	Greg Kinsall, PG	Field Task Leader
Ramboll	Elizabeth Miesner, MPH	Health Risk Assessment Task Leader
Ramboll	Craig Knox	Analytical Task Leader\Database Administrator
Ramboll	Kristin Drucquer	Data Validation Coordinator
Tetra Tech	Dan Pastor, PE	Project Manager
Tetra Tech	Gina Heaton	Project Quality Assurance/Quality Control Officer
Tetra Tech	Kyle Hansen, CEM	Field Task Leader
Tetra Tech	Valerie Bogle	Database Administrator
Tetra Tech	Maureen McMyler	Data Validation Coordinator
Eurofins Air Toxics	Kelly Buettner	Laboratory Project Manager
Eurofins Environment Testing America	Mary Charlson	Laboratory Project Manager
Pace Analytical National Center for Testing and Innovation	Jared Starkey	Laboratory Project Manager
Silver State Analytical Laboratories, Inc.	Stephen West	Laboratory Project Manager
EMSL Analytical Inc.	Daniel Kocher	Laboratory Project Manager
Geotechnical & Environmental Services	Robert Thomsen	Laboratory Project Manager
Integrated Geosciences Laboratories	Emeka Anazodo	Laboratory Project Manager

Organization	Name	Project Role/Title
Microbial Insights	Jennifer Amos	Laboratory Project Manager
Laboratory Data Consultants	Stella Cuenco	Data Validation Project Manager
Neptune and Company	Phil Conley	Data Validation Project Manager

APPENDIX B
LABORATORY QUALITY ASSURANCE MANUALS (QAMs)

[provided electronically]

APPENDIX C
LABORATORY STANDARD OPERATING PROCEDURES (SOPs)

[provided electronically]

APPENDIX D
RAMBOLL LABORATORY ELECTRONIC DATA DELIVERABLE FORMAT SPECIFICATION, EQUIS EDITION

[provided electronically]

APPENDIX E
NDEP DATA VALIDATION GUIDANCE

[provided electronically]

APPENDIX F
QAPP ADDENDA REQUIREMENTS

Appendix F. QAPP Addenda Requirements

A QAPP Addendum will be prepared for deviations to the *Quality Assurance Project Plan, Revision 6, Nevada Environmental Response Trust Site, Henderson, Nevada* (Ramboll 2020) and when new sample collection tasks need to be added to the current QAPP. The following elements are required to be updated when a new data collection task is required that is not addressed in the current QAPP or a variance to the current QAPP is identified. The table below is provided as a template to complete a QAPP Addendum. Text in [ ] provides a description of the information that should be inserted.

Title, Version and Approval/Sign-off:

Section 1. New Data Collection Task

New Data Collection Task	QAPP Update
1.1 Type of Collection Task	[List the data collection task i.e., remedial investigation, treatability, pilot study, etc.]

New Data Collection Task	QAPP Update
1.1.2 Data Quality Objectives (DQOs)	[DQOs are task-specific, and may be referenced to the task work plan] 1. State the Problem 2. Identify the Goal of the Study 3. identify the Information Inputs 4. Define the Boundaries of the Study 5. Develop the Analytical Approach 6. Specify Performance of Acceptance Criteria 7. Develop the Detailed Plan for Obtaining Data

New Data Collection Task	QAPP Update
1.1.3 Project Organization	[List individual assigned to project roles or roles not identified in the current QAPP. This can be accomplished by attaching a table to the QAPP Addendum.]
1.2 Sampling Design	[Reference task-specific work plan.]
1.2.1 Sampling Methods	[List sample collection procedures or refer to task-specific field sampling plan and or task-specific work plan. This can be accomplished by attaching a table to the QAPP Addendum.]
1.2.2 Analytical Methods	[List sample containers, preservation, and holding times. This can be accomplished by attaching a table to the QAPP Addendum.]
1.2.3 Field QC Procedures	[List any deviations for quality control requirements]

Section 2. Laboratory Requirements

Laboratory Requirements	QAPP Update
2.1 Name and Contact Information for Laboratory	[List new contact information]
2.1.1 Analytical Methods & QC Requirements	[List of any new methods]
2.2.2 Analytes, Reporting Limits, and Screening Criteria	[List new parameters or updates]
2.2.3 QAMs and SOPs	[Attach as appendix to QAPP Addendum]

Section 3. Data Validation and Usability

Validation Requirements	QAPP Update
3.1 Stage of validation and review requirements	[List NDEP validation stage required]
3.1.1 Data validation subcontractor or consultant responsible for data validation	[List subcontractor or role of person responsible for validation]

Validation Requirements	QAPP Update
3.1.2 PARCCS criteria	[List deviations for precision, accuracy, representativeness, comparability, completeness, sensitivity]
3.1.3 Validation Guidance	[List any new validation guidance criteria required]
3.1.4 Validation Qualifiers and Reason Codes	[List any new validation qualifiers and reason codes]