SEMS-RM DOCID # 100029752

Sampling and Analysis Plan

APN 525-171-009-000
Loop Road, Hoopa, California

Prepared for:

Hoopa Valley Tribe Department of Natural Resources

January 2021

019227

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QA/QC: RMR___
Reference: 019227

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Distribution List

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Acronyms and Abbreviations

ACM	asbestos containing material
APN	Assessor's parcel number
ASTM	ASTM International
BGS	below ground/grade surface
BIA-PR	Bureau of Indian Affairs-Pacific Region
CAC	Certified Asbestos Consultant
CARB	California Air Resources Board
CFR	Code of Federal Regulations
COCs	constituents of concern
DECRMS	Division of Environmental, Cultural Resource Management and Safety
DFRs	daily field reports
EPA	U.S. Environmental Protection Agency
ESA	environmental site assessment
Eurofins	Eurofins EMLab P&K
HCHWP	Humboldt County Hazardous Waste Program
HVFP	Hoopa Valley Tribal Fisheries Program
IDW	investigation-derived waste
MQO	measurement quality objective
NR	no reference
PG	professional geologist
PLM	polarized light microscopy
PPE	personal protective equipment
PT	precision testing
QA/QC	quality assurance/quality control
QAM	quality assurance manual
QAO	quality assurance officer
RPD	relative percent difference
S_1	sample
S_2	duplicate
SAP	sampling and analysis plan
SOP	Standard Operating Procedure
TP-#	test pit-number
USA	Underground Service Alert

1.0 Introduction

This sampling and analysis plan (SAP) has been prepared for a portion of the property located west of Highway 96 and east of Loop Road (site) in Hoopa, California (Figure 1). The property is further defined as Humboldt County Assessor's parcel number (APN) 525-171-009-000. This SAP describes protocols and procedures that will be implemented for characterization of potential asbestos containing materials (ACM) and asbestos impacts to soil associated with historical disposal of building materials at the site. A Phase I environmental site assessment (ESA) completed by the Bureau of Indian Affairs, Pacific Region (BIA-PR) Division of Environmental, Cultural Resource Management and Safety (DECRMS) in May 2019 (BIA-PR, 2019), identified tile fragments in the northwestern, southwestern, and southeastern portions of the site that are suspected to contain Chrysotile asbestos based on preliminary laboratory analysis. The Phase I ESA recommended further investigation to determine the extent of suspect ACM at the site.

This SAP is intended to characterize suspect ACM building materials and evaluate potential asbestos impacts to soil resulting from historical dumping of construction materials at the site. Soil and building materials characterization data from this investigation will be used to evaluate remediation options for the site. This SAP provides procedures designed to ensure quality assurance/quality control (QA/QC) in the collection and reporting of data that are scientifically valid, representative of field conditions, and are legally defensible.

1.1 Site Location

The subject site is located west of Highway 96 and east of Loop Road in Hoopa, in the County of Humboldt, California. One parcel comprises the site and is identified by the Humboldt County Assessor as APN 525-171-009-000. The site is located immediately north of the Hoopa Valley Elementary School. The approximate elevation of the site varies from approximately 99 feet to 103 feet above mean sea level.

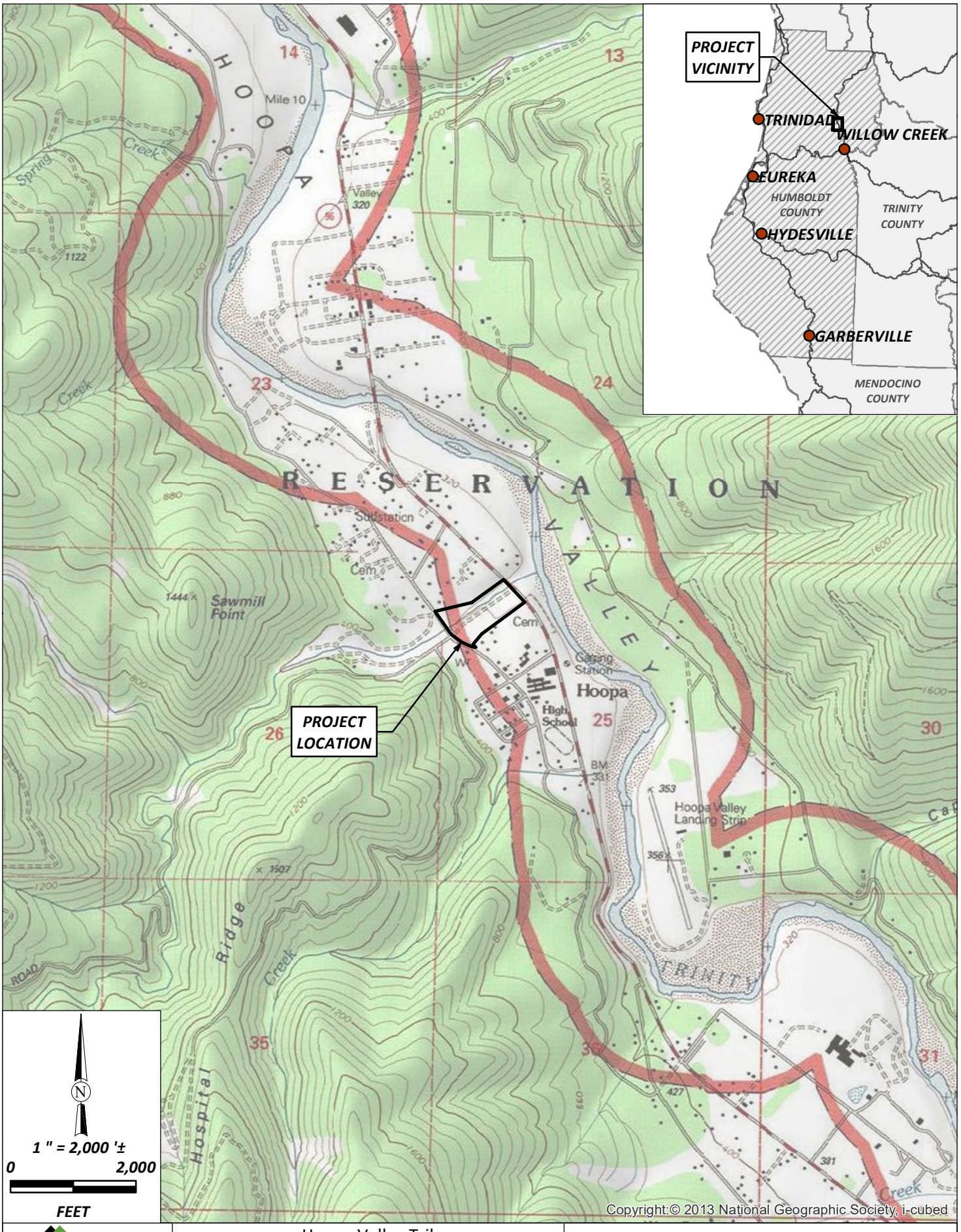
1.2 Project Roles

The United States Environmental Protection Agency (EPA) is providing project oversight. The Hoopa Valley Tribe Department of Natural Resources is undertaking the site investigation activities described in this SAP. SHN has developed this SAP and will be providing project oversight, coordination, sampling, and reporting services.

1.3 Project Organization

Table 1. Key Project Personnel Contact Information and Responsibilities APN 525-171-009-000, Hoopa, California

Title	Name	Phone Number Email Address	Responsibilities
Environmental Protection Agency (EPA) Project Manager	Eric Byous	(415) 972-3531 Byous.Eric@epa.gov	Project oversight



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SHN	Hoopa Valley Tribe Supply Creek Sampling and Analysis Plan Hoopa, California	Project Location Map SHN 019227
November 2020	Figure1_ProjectLocationMap	Figure 1

Table 1. Key Project Personnel Contact Information and Responsibilities
APN 525-171-009-000, Hoopa, California

Title	Name	Phone Number Email Address	Responsibilities
Project Manager	Ken Norton, Director of Land Management, Hoopa Valley Tribe Department of Natural Resources	(530) 625-5515 kenpnorton@gmail.com	Project planning and management
Contractor Project Manager	Anna Gower SHN	(707) 441-8855 agower@shn-engr.com	Oversight of project planning, implementation, budgeting, communication with client, and funding entity
Contractor Quality Assurance Officer (QAO)	Roland Rueber, PG SHN	(707) 845-5909 rrueber@shn-engr.com	Oversight of planning and execution of approved work scope, and assurance of attainment of data quality objectives
Certified Asbestos Consultant	Mitch Edwards, CAC	(925)-689-9737 mitch@sensibleinc.net	Oversight of procedures for sampling asbestos containing building materials and report review
Contractor Field Team Leader	Mike Palmer SHN	(530) 515-7487 mpalmer@shn-engr.com	Oversight of field implementation of approved work scope, troubleshooting
Laboratory Quality Assurance Officer	Allie Peregoy Eurofins EMLab P&K (Eurofins)	(858) 354-1379 Allie.Peregoy@eurofinset.com	Eurofins quality assurance

2.0 Background

2.1 Site and Sampling Area Description

The investigation area is a portion of an approximately 15-acre parcel located in tribal lands within Hoopa, California. The location of the proposed Phase II ESA activities is less than two acres. The site is generally vacant and vegetated with grasses and some mature trees. A reported wastewater infrastructure in the northern portion of the site is surrounded by an existing chain link fence. A project location and site map are included as Figures 1 and 2, respectively. The location of the proposed test pits is shown on Figure 3.

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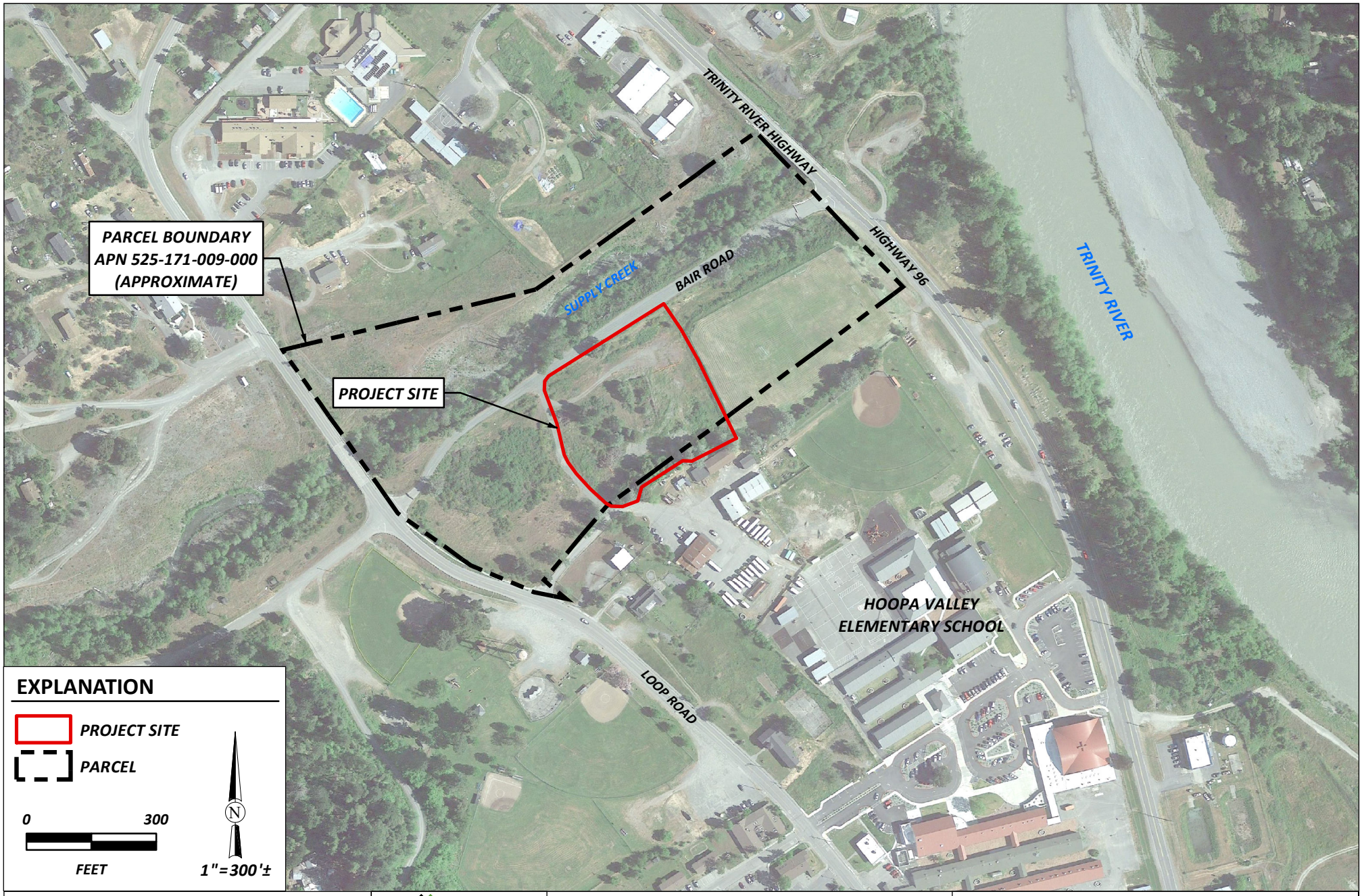

APN - ASSESOR PARCEL NUMBER
PARCEL DATA SOURCE: HUMBOLDT COUNTY GIS, 2020
IMAGE SOURCE: GOOGLE EARTH, DATED 4/30/2019

Hoopa Valley Tribe
Supply Creek Sampling and Analysis Plan
Hoopa, California

Site Map
APN 525-171-009-000
SHN 019227

November 2020 | Figure2_SiteMap | Figure 2

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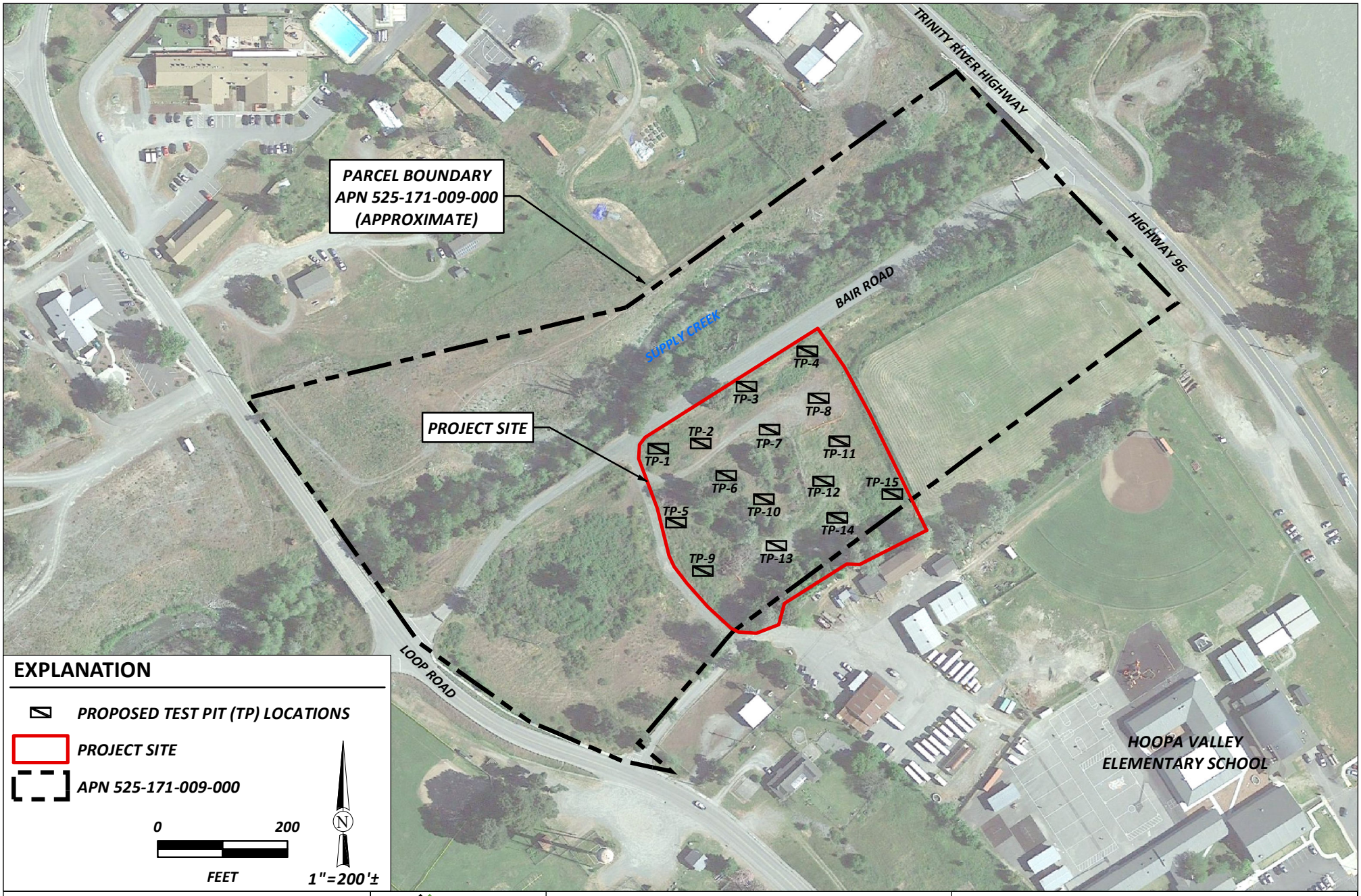

APN - ASSESOR PARCEL NUMBER
PARCEL DATA SOURCE: HUMBOLDT COUNTY GIS, 2020
IMAGE SOURCE: GOOGLE EARTH, DATED 4/30/2019

Hoopa Valley Tribe
Supply Creek Sampling and Analysis Plan
Hoopa, California

Proposed Sample Locations
APN 525-171-009-000
SHN 019227

November 2020 | Figure3_ProposedSamplingLocations | Figure 3

2.2 Site History

According to the BIA-PR Phase I ESA, the lower reaches of Supply Creek were subject to channelization to protect areas slated for future development. Channelization of Supply Creek included the construction of a berm along the south-southeastern bank of the creek. The Hoopa Valley Tribal Fisheries Program (HVFP) initiated efforts to improve stream conditions in support of salmonids production because negative impacts were observed due to the previous channelization of Supply Creek.

A primary component of the HVFP improvement efforts included the realignment of a road located along the south-southwestern property line of the site. Debris piles were encountered during the initial clearing of the roadbed. The debris piles reportedly included old tiles and other materials that prompted notification to the Humboldt County Hazardous Waste Program (HCHWP). HCHWP collected samples of the uncovered debris pile materials for submittal to TEM Laboratories in Berkeley, California for asbestos analysis. Laboratory analysis indicated the materials contained Chrysotile asbestos. On October 15, 2018, the HVFP recommended to the Hoopa Valley Tribal Council that the following actions be completed with respect to the suspect ACM material at the site:

1. Restrict access to the site.
2. Remove uncovered tiles.
3. Complete an assessment of the extent of suspect ACM and asbestos soil impacts at the site.

On April 17, 2019, the site property owner filed a technical assistance request with the BIA-PR for the preparation of the Phase I ESA in conformance with the ASTM International (ASTM) 1527-13 standard to initiate the process of Phase II ESA activities, which would determine the extent of the suspect ACM and potential soil impacts.

2.3 Impact on Human Health and/or the Environment

There are potential impacts to human health and/or the environment resulting from the presence of suspect ACM in the debris piles located on the site. Constituents of concern (COCs) associated with these debris piles have the potential for adverse effects to human health and the environment and are summarized below:

- Asbestos in construction materials and soil

3.0 Sampling Design and Rationale

This section presents field characterization efforts, media to be sampled, sample collection rationale, and analytical parameters. Sampling protocols for field personnel to be implemented during the SAP are provided in Appendix 1.

3.1 Soil Sampling

Rationale for the proposed soil sample locations is provided in Table 2. Proposed sample locations are presented on Figure 2.

Table 2. Proposed Soil Samples
APN 525-171-009-000, Hoopa, California

Boring Identification	Location	Sampling Rationale	Approximate Soil Sample Depths (feet BGS)[a]	Laboratory Analysis
TP-1	Northwestern corner of the site along Bair Road	Evaluate soil quality due to the presence of suspect ACM[b] at the site	0.5-1.0 and 4.0-5.0	Asbestos by CARB 435[c]
TP-2	Northwestern corner of the site along Bair Road	Evaluate soil quality due to the presence of suspect ACM at the site		
TP-3	Northern portion of the site along Bair Road	Evaluate soil quality due to the presence of suspect ACM at the site		
TP-4	Northeastern corner of the site along Bair Road	Evaluate soil quality due to the presence of suspect ACM at the site		
TP-5	Along the western property line	Evaluate soil quality due to the presence of suspect ACM at the site		
TP-6	Central portion of the site	Evaluate soil quality due to the presence of suspect ACM at the site		
TP-7	Central portion of the site	Evaluate soil quality due to the presence of suspect ACM at the site		
TP-8	Along the eastern property line	Evaluate soil quality due to the presence of suspect ACM at the site		
TP-9	Southwestern portion of the site	Evaluate soil quality due to the presence of suspect ACM at the site		
TP-10	Central portion of the site	Evaluate soil quality due to the presence of suspect ACM at the site		
TP-11	Along the eastern property line	Evaluate soil quality due to the presence of suspect ACM at the site		
TP-12	Central portion of the site	Evaluate soil quality due to the presence of suspect ACM at the site		
TP-13	Along the southern property line	Evaluate soil quality due to the presence of suspect ACM at the site		
TP-14	Along the southern property line	Evaluate soil quality due to the presence of suspect ACM at the site		
TP-15	Southeastern portion of the site	Evaluate soil quality due to the presence of suspect ACM at the site		

[a] BGS: below ground surface
[b] ACM: asbestos containing materials
[c] CARB 435: California Air Resource Board analytical method 435

3.2 Construction Materials Sampling

The rationale for sampling of construction materials is to assess the quantity of materials to be disposed of during remediation activities. Based on the BIA-PR Phase I ESA and initial observations and analytical results generated from samples collected from the debris pile, SHN anticipates that approximately 70 samples of potential ACM will be collected and submitted for laboratory analysis of asbestos. Of the 70 total samples, SHN anticipates that approximately 10 samples will be submitted for further point count analysis.

Table 3. Proposed Suspect ACM Samples
APN 525-171-009-000, Hoopa, California

Samples	Location	Sampling Rationale	Analysis
Samples 1 through 70 (identified by material)[a]	Debris piles and if encountered below the ground surface in the proposed test pits	Evaluate materials in the debris piles and in soil	Asbestos by PLM[b] Analysis[c]

[a] Sample identifications will be assigned in the field based on location collected and type of material
[b] PLM: polarized light microscopy
[c] Approximately 10 samples of the total 70 samples will be submitted for further point count analysis

4.0 Request for Analyses

4.1 Proposed Analyses

Samples collected during the site investigation will be analyzed for asbestos in soil and construction materials using the following methods:

- Soil samples will be analyzed using California Air Resources Board (CARB) Method 435, Asbestos Analysis in Soil and Rock using Polarized Light Microscopy (PLM).
- Potential ACM samples will be analyzed using EPA Method 600/R-93/116 and EPA 40 CFR (Code of Federal Regulations) App E to Sub E of Part 763.

Table 4. Sample Handling and Preservation Requirements
APN 525-171-009-000, Hoopa, California

Parameter	Method	Containers	Preservation	Maximum Holding Time
Soil				
Asbestos	CARB 435[a]	8-ounce glass jar	None	1 year
Construction Material				
Asbestos	EPA[b] Method 600/R-93/116 and EPA 40 CFR[c] App E to Sub E of Part 763	heavy-duty plastic resealable bag	None	1 year

[a] CARB: California Air Resources Board
[b] EPA: United States Environmental Protection Agency
[c] CFR: Code of Federal Regulations

4.2 Analytical Laboratory

Samples will be submitted to Eurofins EMLab P&K (Eurofins) located in South San Francisco, California, an accredited State of California laboratory. Eurofins will complete testing requirements for samples to be analyzed in accordance with the quality assurance manual (QAM) provided in Appendix 2.

5.0 Field Methods and Procedures

In addition to providing this work plan, SHN will coordinate and schedule the activities related to implementation of this investigation, including notifying Underground Service Alert (USA), and corresponding with the EPA.

Field personnel will wear appropriate personal protective equipment (PPE) when working onsite. PPE for sampling activities will comprise of durable outerwear (such as, long pants and a long-sleeved shirt, steel-toed boots, disposable nitrile gloves, and a high visibility vest). Samples will be collected and analyzed in conformance with methods and analyses presented in Sections 3.0, 4.0, and 5.0 of this SAP. Sample tracking and shipping will be performed in conformance with information presented in Section 6.0 of this SAP.

5.1 Field Equipment

5.1.1 List of Equipment

Equipment to be used during the field program will consist of dedicated single-use disposable items, select hand tools, and mechanized equipment. Sample containers will be clean laboratory-supplied containers or new heavy-duty plastic resealable bags. Table 5 presents proposed field and sampling equipment for this project.

Table 5. Field and Sampling Equipment
APN 525-171-009-000, Hoopa, California

Description of Equipment	Material	Dedicated
Backhoes/excavator	Steel/metal	No
Trowel	Stainless steel	No
Sample Containers	Glass and plastic	Yes
Decontamination Equipment	Distilled water, Liquinox, bucket, and scrubbing device (sponge/brush)	Yes

Boring completion and soil sample collection will use:

- Rubber-tired backhoe or track-mounted excavator
- Stainless steel trowel
- Laboratory-supplied containers
- heavy-duty plastic resealable bags

5.1.2 Calibration of Field Equipment

There is no equipment proposed for use on this project that requires calibration.

5.2 Field Program Standard Operating Procedures

Procedures to be followed during implementation of the field program are outlined in the SHN standard operating procedures (SOPs) provided in Appendix 1.

5.2.1 Soil Sampling

To evaluate the extent of potential asbestos impacts in subsurface soils at the site test pits, shown in Figure 3, are proposed for completion to approximately 5 feet below ground surface (BGS) using rubber-tired backhoe or track-mounted excavator. Soil sample collection depths are proposed for an interval from approximately 6 to 12-inches BGS and are intended to evaluate soils at or near the surface where suspect ACM has been deposited at the site. A second soil sampling interval is proposed from approximately 4 - 5 feet BGS.

A clean stainless-steel trowel will be used for placement of sample material in laboratory-supplied containers. Soil samples will be placed in an appropriate shipping container, shipped to the analytical laboratory under chain-of-custody documentation, and analyzed for the constituents shown in Section 4.1: Proposed Analyses. Soil samples will be described in general accordance with the Unified Soil Classification System under the direction of a licensed professional geologist. Following completion of sampling, the test pits will be backfilled with the removed soil and tamped with the equipment bucket.

5.2.2 Construction Material Sampling

Approximately 70 samples are proposed for collection from the debris piles and subsurface soil at the site. Suspect ACM material that is visible within the debris piles at the site will be collected and submitted for laboratory analysis. As there is evidence of debris piles containing suspect ACM at the property, samples of construction materials that may be present BGS will be collected and submitted for laboratory analysis. Table 5 presents equipment anticipated for use in ACM sample collection. Suspect ACM samples will be collected in heavy-duty plastic resealable bags. Suspect ACM samples will be placed in an appropriate shipping container, shipped to the analytical laboratory under chain-of-custody documentation, and analyzed for constituents shown in Section “4.1: Proposed Analyses.”

5.3 Decontamination Procedures

The backhoe/excavator bucket will be cleaned prior to use on site. Residual material will be removed, and the equipment will be decontaminated between each test pit location. Small equipment that requires onsite cleaning will be cleaned using a triple wash system, comprised of a Liquinox® solution wash, followed by two distilled water rinses.

Decontamination of sampling equipment will be conducted consistently to ensure the quality of samples collected. Equipment that contacts potentially contaminated materials will be decontaminated. Decontamination will occur prior to and after each use of non-dedicated equipment.

Equipment will be decontaminated in a pre-designated area at the site on plastic sheeting. Cleaned small equipment will be stored in plastic bags. Sampling equipment to be stored more than a few hours will be covered.

6.0 Sample Containers, Preservation, Packaging, and Shipping

The number and type of sample containers, volumes, and preservatives are listed in Table 4. Containers that are supplied by the laboratory and will not be rinsed prior to sample collection.

6.1 Soil Samples

Soil samples for analysis from test pits will be collected from a sample bowl using a trowel and placed into 8-ounce glass jars. The quantity and size of soil jar for each required analysis is provided in Table 4

6.2 Construction Materials Samples

Construction materials in the debris piles and if encountered in test pits will be placed into heavy-duty plastic resealable bags.

6.3 Packaging and Shipping

Sample containers will be placed in a strong-outside shipping container. The following outlines the packaging procedures that will be followed. Samples will be delivered by SHN personnel to Eurofins.

1. Label sample containers using indelible ink.
2. Double seal sample containers in heavy-duty plastic resealable bags. Write the sample numbers on the outside of the plastic bags with indelible ink.
3. Place samples in a sturdy cooler lined with a large plastic trash bag. Enclose the appropriate chain-of custody forms in a re-closeable plastic bag affixed to the underside of the cooler lid.
4. Samples will be delivered to Eurofins by a commercial shipping company.

7.0 Sample Documentation

7.1 Field Notes

This section presents the methods of documentation of fieldwork, personnel involved with field efforts, site conditions, activities performed, and other observations.

7.1.1 Daily Field Reports

Daily field reports (DFRs) will be completed by SHN field personnel during performance of this work. At a minimum, the following information will be recorded during collection of each sample:

- Sample location and description
- Map sketch showing sample location and measured distances
- Sampler's name
- Date and time of sample collection
- Type of sample
- Sampling equipment used

- Field observations and details related to analysis or integrity of samples (for example, weather conditions, noticeable odors, colors, and so on)
- Preliminary sample descriptions

In addition to the sampling information, the following specific information will be recorded in the DFR for each day of sampling:

- Team members and their responsibilities
- Time of arrival/entry on site and time of site departure
- Other personnel on site
- Summary of meetings or discussions with project-related personnel
- Deviations from sampling plans, site safety plans, and procedures
- Changes in personnel and responsibilities with reasons for the changes
- Levels of safety protection

7.1.2 Photographs

Photographs will be taken at the sampling locations. For each photograph taken, the following information will be written in the logbook or recorded in a separate field photography log:

- Time, date, location, and weather conditions
- Description of the subject photographed
- Name of person taking the photograph

7.2 Sample Labeling

Samples collected will be labeled in a clear and precise way for proper identification in the field and laboratory tracking. An example of the sample label is included in Appendix 4. Each sample will have a pre-assigned, identifiable, and unique number. At a minimum, sample labels will contain the following information: test pit identification, date and time of collection, analytical parameter(s), and method of preservation, if applicable.

7.3 Sample Chain-Of-Custody Forms

Sample delivery and shipments will be accompanied by a chain-of-custody record. A copy of the form is found in Appendix 4. Form(s) will be completed and sent with the samples for each laboratory and delivery/shipment.

The chain-of-custody form will identify shipment contents and maintain custodial integrity of the samples. A sample is considered to be in someone's custody if they maintain physical possession, locked up, or kept in a secured area that is restricted to authorized personnel. Until the samples are shipped, the custody of the samples will be the responsibility of SHN field personnel. The sampling team leader or designee will sign the chain-of-custody form in the “relinquished by” box and note the date and time.

8.0 Disposal of Residual Materials

In the process of collecting environmental samples, the field team will generate different types of potentially contaminated investigation derived waste (IDW) that include the following:

- Used personal protective equipment (PPE)
- Disposable sampling equipment
- Decontamination fluids

The EPA's National Contingency Plan requires that management of IDW generated during sampling comply with applicable or relevant and appropriate requirements to the extent practicable. The sampling plan will follow the "Office of Emergency and Remedial Response Directive 9345.3-02" (May 1991), which provides guidance for the management of IDW. In addition, other legal and practical considerations that may affect the handling of IDW will be considered.

- Used PPE and disposable equipment will be double bagged and placed in a municipal refuse dumpster. These wastes are not considered hazardous and can be sent to a municipal landfill. PPE and disposable equipment to be disposed of that can still be reused will be rendered inoperable before disposal in the refuse dumpster.
- Decontamination fluids generated during the sampling event will be stored onsite in a United Nations 1A2, 55-gallon drum. Pending results of the sample testing, the water will be transported to a licensed facility permitted to accept the material.

9.0 Project and Data Quality Objectives

9.1 Project Task and Problem Definition

The project involves evaluating the presence or absence of asbestos in site soil and construction debris to assist in an evaluation of risks to human health and the environment and identifying potential redevelopment options.

9.2 Project Activities

The scope of work is designed to provide the information needed to meet project objectives, and include:

- Coordination and USA notification
- Field program implementation
    - Install test pits for collection of soil samples.
    - Collect sample collection of ACM located within site debris piles and at depth, if applicable, in proposed test pits.
    - Submit the soil and ACM samples for laboratory analysis.
    - Conduct a global positioning system survey to locate each test pit.
    - Dispose of investigation-derived waste at a facility licensed to accept the materials as classified.
- Reporting—Prepare a report of findings including the results of the field investigation, data analysis, and recommendations if necessary.

9.3 Data Quality Objectives

Quality assurance objectives for the soil quality assessment at the site are intended to provide guidance for collecting and evaluating data that represent site conditions. Table 6 presents project goals for data quality objectives.

Table 6. Quality Assurance Goals for Laboratory Analyses
APN 525-171-009-000, Hoopa, California

Laboratory Measurements	Quality Assurance Goal	Accuracy Goal	Completeness (percent)
Soil			
Asbestos by CARB[a] 435	Varies	98%	90
Construction Materials			
Asbestos by EPA[b] Method 600/R-93/116 and EPA 40 CFR[c] App E to Sub E of Part 763	Varies	98%	90

[a] CARB: California Air Resources Control Board
[b] EPA: United States Environmental Protection Agency
[c] CFR: Code of Federal Regulations

The parameters used to evaluate data quality and their definitions are:

- Representativeness: The degree to which data is characteristic of environmental conditions through:
    - Precision: A measurement of the degree of agreement of replicate data, which is quantitatively assessed, based on the relative percent difference (RPD) or standard deviation.
    - Accuracy: The agreement of a measurement with an accepted reference or true value.
    - Completeness: The amount of valid data obtained from a prescribed measurement system throughout the project as compared with that expected and required to meet the project goals.
- Comparability of data throughout the project will be attained by recording field and laboratory data in consistent units.

Soil and ACM samples will be submitted to the laboratory for analysis described in Section 4.0. Required laboratory sample containers, sample preservation, and sample hold times for each analytical method are also described in Section 4.0.

9.4 Measurement Quality Objectives

Measurement quality objectives (MQO) shall be maintained through data review and validation. Data validity will be measured in terms of precision, accuracy, and completeness.

9.5 Data Review and Validation

The quality assurance officer (QAO) will perform a Tier 1A level data validation. Tier 1A level data validation may include, but is not limited to:

- Review of the data package for completeness
- Review of chain-of-custody forms for consistency with laboratory reported information, signatures, sample condition upon receipt by the laboratory, and sample preservation
- Review of holding times
- Review of quality control summaries
- Random checks of reported results against raw data
- Random checks of raw data for interference problems or system control problems

If comparison of data to QA/QC objectives indicates anomalies, the laboratory will be instructed to review the submitted data and SHN will review the methods used to collect and handle the samples. If anomalies remain, the laboratory may be asked to re-analyze samples. The quality assurance manuals for the analytical laboratories present procedures for reviewing and validating data (Appendix 2). The methods for assessing field and laboratory data are discussed below.

9.6 Data Assessment

As discussed in Section 9.3, data validity will be measured in terms of precision, accuracy, and completeness. The ways in which these three parameters will be evaluated for project data are described below.

9.6.1 Precision

For data generated by the laboratory, data precision will be estimated by comparing analytical results from duplicate samples. The comparison will be made by calculating the RPD given by:

$$RPD = \frac{[S_1 - S_2]}{(S_1+S_2)/2} \times 100$$

Where: RPD: Relative Percent Difference
S_1: Sample
S_2: Duplicate

9.6.2 Accuracy

There is no recovery, spike, or background concentration in bulk asbestos analysis by PLM for soil or ACM. The laboratory derives its accuracy data from participation in external proficiency testing, as well as monthly blind analyses of prior proficiency testing samples. Accuracy is determined by applying the laboratory's current PLM QC acceptance criteria as control limits for the data set.

Eurofins provided an example of this accuracy method in electronic correspondence dated December 23, 2020. Eurofins stated that regarding accuracy, the data set is compiled of approximately 24 months of precision testing (PT)/unknowns data. Control charting (Youden plot, line chart, or etc.) of the analyzed samples with these PT/unknowns against the applied control limits will be completed. Outliers are reviewed for further root cause/corrective action. Eurofins provided data for 62 samples, with one outlier identified, and estimated approximately 98.4% accuracy over time. A copy of the Eurofins provided accuracy data is included in Appendix 2.

Alteration or failure to meet these goals shall not be construed to indicate that the data collected is invalid. The data may be suitable for site characterization and risk assessment if the uncertainty is adequately characterized.

9.6.3 Completeness

Data generated during the site investigation effort will be evaluated for completeness, specifically, the amount of data meeting project QA/QC goals. If data generated during field operations or analytical procedures appears to be questionable as to representativeness of actual conditions, the Project Manager or Project QAO will review field and/or laboratory procedures to evaluate the cause of perceived differences from anticipated results. If data anomalies cannot be explained, re-sampling may be necessary. Goals for data completeness are presented in Table 6.

9.7 Data Management

Field task leaders are responsible for monitoring collection and reporting of field data. Field task leaders will review field measurements at the time of measurement and re-measure parameters, as necessary. Monitoring of field data will be a continuous process. An audit in the field is not anticipated given that no equipment being used will require calibration.

Field data will be recorded on field data sheets (located in Appendix 4) as they are collected and maintained in SHN's office project file. Upon delivery to SHN's office, appropriate field data will be entered into a computer database to expedite the validation and interpretation process. The Project Manager, Project QAO, or Task Leader will review field procedures if deficiencies are perceived to skew analytical outcomes.

9.8 Management of Laboratory Data

Results of laboratory analyses will be reported as specified in the laboratory's QA manual. Analytical results will be downloaded and managed by the laboratory with a computerized acquisition system. Laboratory calculations will be performed for each analytical method in conformance with acceptable laboratory standards. Each laboratory will retain QA/QC records for a minimum of six years. Copies of raw data will be available for review at the laboratory and may be requested as part of SHN's QA/QC review. Original laboratory reports will be stored in SHN's project files. SHN will enter laboratory data into a computerized database to expedite data reduction, interpretation, and reporting.

9.9 Assessment Oversight

The Project QAO shall review laboratory analytical results upon receipt of the reports. Analytical data achieving QA/QC goals will be used in the decision-making process. Data falling outside of QA/QC goals will be re-evaluated. Re-sampling and analysis may be performed to achieve QA/QC targets, if necessary.

10.0 Quality Control

10.1 Field Quality Control Samples

The EPA recommends collection of field quality control samples at a rate of one quality control sample for every 20 samples collected. Thirty (30) soil samples and 70 ACM samples are planned for collection. Two field duplicates will be collected for the soil samples and one duplicate for every 20 construction

material samples. This proposed approach will satisfy the recommended number of field quality control samples. The locations and rationale for field duplicate sample locations are provided in Section "10.1.2: Assessment of Field Variability."

10.1.1 Assessment of Field Contamination

10.1.1.1 Equipment Blanks

Not applicable.

10.1.1.2 Field Blanks

Not Applicable.

10.1.1.3 Trip Blanks

Not Applicable.

10.1.2 Assessment of Field Variability

Duplicate soil samples will be collected in the field to verify COC concentrations and evaluate concentration variability in target materials for reuse onsite or disposal at a landfill. Duplicate samples will be collected at the same time and in the same manner as the primary sample is collected, adhering to preservation, testing, and holding times. For this site investigation, duplicate samples will be collected for the COCs identified and will include the following locations:

- **Soil**: Test pits TP-6 and TP-15
- **Construction Materials:** 1 for every 20 construction materials sampled

Duplicate samples will be preserved, packaged, and sealed in the same manner as other samples of the same matrix. A separate sample number will be assigned to each duplicate and submitted blind to the laboratory.

10.2 Laboratory Quality Control Samples

The anticipated sample volume shall contain sufficient material for both routine sample analysis and additional laboratory QC analyses. Separate soil and groundwater samples for laboratory QC purposes will not be collected.

11.0 Field Variances

Given that conditions in the field may vary, it may be necessary to implement minor modifications to sampling as proposed. When appropriate, the QAO will be notified and a verbal approval will be obtained before implementing changes. Modifications to the approved plan will be documented in the sampling project report.

12.0 Reporting

Following completion of the field program, SHN will prepare and submit a report of findings. The report will include: a description of the work performed, a summary of the sampling results, analytical

laboratory reports, site maps illustrating sample locations and analytical results, and recommendations for additional work, if needed. The report will be submitted within 60 days of receipt of laboratory analytical data.

13.0 References Cited

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1 Protocols

Protocol A-1.Collection of Soil Samples-Test Pits

1.0 Introduction

This SHN protocol describes the procedures to be followed during the excavation and logging of test pits. The information gathered from the exploratory test pits will provide information about geologic conditions and/or soil quality. The procedures presented herein are intended to be of general use. If warranted, the project manager will make appropriate revisions as the work progresses. Detailed procedures in this protocol may be superceded by applicable regulatory requirements.

2.0 Excavation of Test Pits

Underground utility marking will be conducted by marking the proposed excavation in white paint at least 72 hours prior to ground disturbing activities. At least 72 hours prior to ground disturbing activities Underground Services Alert (USA) shall be contacted regarding utility service provider notification. The test pits will be completed with a rubber-tire backhoe or excavator to the proposed depth specified in the scope of work or workplan. Sampling and logging of test pit excavations greater than four feet below ground surface (BGS) shall not be completed without shoring or benching.

The SHN Project Manager will determine the specific depth of each test pit prior to excavation. The SHN field geologist/engineer/scientist will specify to the Equipment Operator the depth of soil sample collection, method of sample retrieval, and other matters pertaining to the satisfactory completion of the test pits.

The non-dedicated sampling equipment and backhoe/excavator bucket shall be thoroughly steam cleaned or washed in a water solution containing Liquinox®, followed by a water rinse on site before ground disturbing activities and at the beginning and end of each day used at the project site. Potable water from a municipal supply will be used for decontamination of excavation and sampling equipment. Decontamination rinsate shall be collected and stored for future disposal by the client in accordance with state and local regulations.

3.0 Sampling and Logging

3.1 Obtaining Samples

Soil samples will be collected at depth intervals specified by the SHN project manager. A test pit log of these samples will be made. Samples for chemical analysis will be collected in accordance with "Protocol A-2: Soil Sampling for Chemical Analysis."

All soil samples will be stored and labeled to show project number, boring number, and sampling interval denoted either by depth or sequential numbering system. Procedures for the preservation and transport of soil samples retained for chemical analysis are presented in "Protocol A-2: Soil Sampling For Chemical Analysis."

3.2 Logging of Test Pits

The observations of the field geologist/engineer will be recorded on a test pit log at the time of excavation. The operator and the field geologist/engineer will determine any changes in the field program based on significant changes in material encountered. The field geologist/engineer will observe and record changes in lithology on the test pit log.

A lithologic description will be recorded on the log using the Unified Soil Classification System (USCS) as described in American Society for Testing and Materials-International (ASTM) D 2488-90. This description will include the USCS soil type, grain sizes and estimated percentages of each, moisture content, color, plasticity for fine-grained materials, consistency or density, and any other pertinent information, such as degree of induration, calcareous content, and presence of fossils and other distinctive materials.

4.0 Field Screening

Soil samples at the test pit locations may be screened using a portable meter such as a Photoionization Detector (PID), a Lower Explosive Limit (LEL) meter, or other organic vapor meter. The meter may be used to assess the presence of Volatile Organic Compounds (VOCs) or other gases in soil samples. Procedures for field screening are described in "Protocol A-2: Soil Sampling For Chemical Analysis."

5.0 Destroying Test Pits

If appropriate, material removed from the test pit will be placed back into the pit and tamped with the equipment bucket. If the material is not suitable for reuse, it will be placed on and covered with visqueen. Samples will be collected for disposal characterization, and the material will be transported to a licensed disposal facility.

1.0 Introduction

This SHN Engineers & Geologists, Inc. (SHN) protocol describes procedures to be followed for collecting soil samples and conducting soil field screening in conjunction with the excavation of test pits. Selected soil samples will be submitted to a designated laboratory for chemical analysis. The laboratory must be certified by the California Department of Health Services (DHS) or other appropriate agency for the analyses to be performed. The procedures presented herein are intended to be of general use. As the work progresses and if warranted, appropriate revisions will be made and approved by the SHN project manager.

2.0 Excavation

The excavation of test pits will be in accordance with "Protocol A-1: Collection of Soil Samples-Test Pits."

3.0 Sample Collection

Soil samples will be collected from the test pit sidewalls (if the test pit is less than 4-feet deep and safe to enter), from a hand auger bucket, or directly from the equipment bucket. Bulk soil may be homogenized in a stainless steel bowl prior to placing into appropriate containers, except in the case where volatile compounds are being analyzed for.

3.1 Sample Containers and Preservation

Appropriate sample containers and preservatives for the analyses to be performed shall be obtained from the subcontracted analytical laboratory. Table 1 of the sampling and analysis plan lists analytical methods and the appropriate storage and handling requirements for site constituents of concern.

3.2 Sample Labeling

Sample containers shall be labeled with self-adhesive tags having the following information written in waterproof ink:

- SHN
- Project identification
- Sample number
- Date and time sample was collected
- Initials of sample collector
- Analysis Requested
- Preservative

4.0 Soil Field Screening

A portable Photoionization Detector (PID), a Lower Explosive Limit (LEL) meter, or other type of organic vapor meter, may be used to screen selected soil samples collected from the test pits. The purpose for the field screening of selected soil samples is to assess the presence of Volatile Organic Compounds (VOCs) in the soil samples. The meter measures total volatile organics in the air in parts per million (ppm) by volume in reference to a selected standard. Calibration of the meter will be performed each day prior to the soil sampling. The meter cannot specifically identify each volatile compound, but can be adjusted to be sensitive to selected VOCs.

The organic vapor meter screening method for selected soil samples consists of transferring a soil sample into a clean glass jar or plastic resealable bag. After some time has elapsed, the headspace will be quickly screened for the presence of VOCs, and the meter will be allowed to return to a zero measurement before the next reading is taken. No soil sample used for field screening will be submitted to the laboratory for chemical analysis. The meter may also be used in the test pits to periodically screen for VOCs in the air space in and around the test pit. All meter readings for soil samples and ambient air will be recorded on test pit logs or daily field record sheets. Positive readings from the meter screening may be used to assist with selection of soil samples for chemical analysis.

5.0 Documentation

5.1 Test Pit Logs

Soil samples collected from test pits will be recorded on the a test pit log. These logs provide a means of uniquely identifying and tracking the samples. When sampling is completed, all original test pit logs and daily field record sheets will be placed in the project file.

5.2 Chain-Of-Custody Procedures

After samples have been collected and labeled, they will be maintained under chain-of-custody procedures. These procedures document the transfer of custody of samples from the field to the laboratory.

A chain-of-custody record will be completed for each sample sent to the laboratory for analysis. Information contained on the form will include:

- Name of sampler
- Sample I.D.
- Date and time sampled
- Number of sample bottles
- Sample Matrix (soil, water, or other)
- Analyses requested

- Remarks, including any preservatives, special conditions, specific quality control measures, or electronic data requests
- Turnaround time and person to receive lab report
- Project number
- Signatures of all people assuming custody
- Signatures of field sampler

The field sampler will sign the chain-of-custody record and will record the time and the date at the time of transfer to the laboratory or an intermediate person. A set of signatures is required for each relinquished/received transfer, including transfer within SHN. The original imprint of the chain-of-custody record will accompany the sample containers. A duplicate copy will be placed in the SHN project file.

6.0 Equipment Cleaning

The sampler, brass or stainless steel liners, spatula, and any tools used during soil sampling will be thoroughly cleaned before and after each use. All soil will be removed from the tools and parts and the tools will be steam-cleaned or washed in a water solution containing Liquinox®, followed by a water rinse, then by a distilled water rinse. Water used in the decontamination of equipment and all well purge water will be contained in 50-gallon plastic drums or 5-gallon buckets. The water will be transported to the SHN purge water storage facility to await proper disposal, if the constituents in the water are included in SHN's disposal permit with the City of Eureka. All decontamination water containing non-permitted constituents will be temporarily stored at the job site, until proper disposal arrangements are made.

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