Field Sampling Plan for:

Phase II Environmental Site Assessment for
85, 105, 125, 155, 185, and 195 North Edison Way
Reno, Nevada

For

Truckee River Flood Management Authority
Reno, Nevada

January 31, 2013

Program Coordinator:	David Friedman, NDEP Brownfields Program
Project Manager:	Phil Tousignant, Kleinfelder
Quality Coordinator:	Mary Siders, NDEP Brownfields Program

Approved by NDEP Brownfields Program Coordinator: Date:

_____ _____

David Friedman

Reviewed by: NDEP Brownfields Quality Coordinator: Date:

_____ _____

Mary Siders

TABLE OF CONTENTS

Attachments:

1 INTRODUCTION

In 2010, the Truckee River Flood Management Authority (TRFMA) acquired six parcels, addressed as 85, 105, 125, 155, 185, and 195 North Edison Way, Reno, Nevada (Site, Figure 1). The TRFMA acquired the Site as part of a flood control project. The six buildings at the Site were demolished in 2010 and the next phase of the project process is to remove the remaining building foundations and re-vegetate the Site. Plate 1 shows the Site location.

Kleinfelder has prepared this Field Sampling Plan (FSP) for assessment activities to be conducted at the Site, located in Reno, Nevada. The proposed assessment activities are being funded by the State of Nevada Brownfields Program. This FSP was prepared in accordance with the Nevada Division of Environmental Protection (NDEP) Quality Assurance Program Plan (QA Program Plan) for the Nevada Brownfields Program (NBP) (NDEP 2007).

The purpose of the assessment activities is to assess soil at the Site for the presence of total petroleum hydrocarbons (TPH) and volatile organic compound (VOCs). The data will be used for planning and soil management during excavation and removal of building foundations and subsurface infrastructure. Infrastructure present at the Site may include utilities (plumbing, electrical, gas), sanitary sewers, storm drain inlets and piping, and water supply piping.

1.1 SITE NAME OR SAMPLING AREA

The six parcels (85, 105, 125, 155, 185, and 195 North Edison Way) will be referred to as the Site throughout this FSP.

1.2 SITE OR SAMPLING AREA LOCATION

The Site is located on North Edison Way, north of Mill Street, near the south bank of the Truckee River, in Reno, Nevada (Figure 1).

1.3 RESPONSIBLE AGENCY

The responsible agency is the TRFMA, which acquired the Site as part of a flood control project.

1.4 PROJECT ORGANIZATION

The following personnel will have the primary roles for the project.

Program Coordinator:	David Friedman, NDEP Brownfields Program (775-687-9385)
Quality Coordinator:	Mary Siders, NDEP Brownfields Program (775-687-9496)
Project Manager:	Phil Tousignant, Kleinfelder (775-689-7800)
Quality Assurance Manager:	Josh Fortmann, Kleinfelder (775-689-7800)
Field Team Leader:	Rick Erdman, Kleinfelder (775-689-7800)
Health and Safety Officer:	Phil Tousignant, Kleinfelder (775-689-7800)

2 BACKGROUND

2.1 SITE OR SAMPLING AREA DESCRIPTION

The Site was previously developed for mixed-commercial use, but the structures were demolished in 2010. Concrete building pads and asphalt paved parking areas remain, but there are no structures remaining on the Site. The Site includes Washoe County Assessor Parcel Numbers (APN) 012-272-04 (48,787 square feet), -05 (65,430 square feet), -06 (43,560 square feet), -07 (43,560 square feet), -08 (43,560 square feet) and -11 (43,821 square feet).

2.2 OPERATIONAL HISTORY

The Site was developed in the early 1970's and has been occupied by a variety of commercial tenants. Businesses previously located the Site include; auto repair shops, a photo developer, construction companies, machine shops, a granite counter top manufacturer, a painter, and restaurants.

2.3 PREVIOUS INVESTIGATIONS/REGULATORY INVOLVEMENT

Phase I Environmental Site Assessments (Phase I ESAs) were completed in 2006 for 85, 105 and 195 North Edison Way (Robison Engineering Company, 2006A, 2006B 2006C). Phase I ESAs were conducted in 2007 for 125, 155 and 185 North Edison Way (Robison Engineering Company, 2007A and 2007B). The Phase I ESAs documented petroleum product and solvent use on the Site. No previous investigations or documented releases are known to have occurred at the Site.

2.4 GEOLOGICAL AND/OR METEOROLOGICAL INFORMATION

The Site is located on Quaternary floodplain deposits of the Truckee River (Qfl). This unit consists of silt, sandy silt, and clayey silt with lenses of well-rounded pebble to cobble gravel. The unit is derived from mainstream and overbank deposition by the Truckee River and includes oxbow lakes and old channels.

The depth to groundwater at the Site is estimated to be approximately 14 feet below ground surface (bgs). This is based on data available for a groundwater monitoring well located on APN 012-271-09(adjacent to the south of the Site). Localized groundwater depth may be influenced by the Site's proximity to the Truckee River and nearby water well pumping, precipitation, and irrigation patterns.

2.5 ENVIRONMENTAL AND/OR HUMAN IMPACT

Based on the historical use of TPH and solvents at the Site, there is a potential for adverse environmental impacts to soil. There are no known negative impacts to human health, since the Site is currently vacant and paved. However, potential future use of the Site may result in removal of pavement and concrete. This may expose contaminant containing soil and present a potential threat to human health.

3 PROJECT DATA QUALITY OBJECTIVES

3.1 PROJECT TASK AND PROBLEM DEFINITION

Phase I ESAs have documented the historical use of TPH and solvents at the Site. Analytical data are needed to evaluate soil for the presence and concentration of contaminants, so that TFRMA can properly plan for soil management during rehabilitation of the Site. Analytical data for soil samples collected at the Site will also help to fulfill the requirements of the Hazard Communication (Right to Know) Act (29 CFR 1910.1200).

The evaluation will begin with a passive soil gas (PSG) survey to screen the entire Site and help refine subsequent soil assessment activities. Soil samples will then be collected from the base or sidewalls from a minimum of ten test pits. If the PSG data indicates the presence of high-mass areas of TPH and/or VOCs, up to eight additional test pits may be excavated to collect additional soil samples.

3.2 DATA QUALITY OBJECTIVES (DQOS)

The DQO process (EPA 2006) is a systematic planning tool that is used to establish performance or acceptance criteria. These criteria, in turn, serve as the basis for designing a plan for collecting data of sufficient quality and quantity to support the goals of a study. The DQO process consists of seven iterative steps. The DQO process completed for this Phase II ESA is presented in Table 1 and summarized below.

Based on the Phase I ESAs performed, several businesses previously occupying the Site may have used or generated hazardous chemicals and waste. Potential contaminants of concern in Site soil include TPH, VOCs, metals, and ethylene glycol.

PSG sample modules will be installed at the Site and analyzed by Beacon Environmental Services, Inc. (Beacon) for TPH and VOCs. The PSG data will consist of mass values, which will be presented by Beacon in compound distribution maps. The

PSG data will be used as a soil screening tool to assess if an increased number of test pits and soil samples are warranted.

Soil samples will be collected from a minimum of ten and up to 18 test pits and analyzed for TPH, VOCs, Resource Conservation and Recovery Act (RCRA) metals, and ethylene glycol. Analytical results will be evaluated relative to screening levels presented in Table 2. If laboratory analysis indicates concentrations in soil exceeding the screening levels, recommendations will be made regarding additional assessment and/or remediation. If contamination is not found above screening levels, future investigation will not be recommended.

3.3 DATA QUALITY INDICATORS (DQIS)

Data quality is judged in terms of precision, accuracy, representativeness, completeness, comparability, and analytical sensitivity; referred to as the PARCCS parameters. Project data will be compared to applicable PARCCS parameters, which are discussed in further detail in Section 5.3 of the QA Program Plan (NDEP 2007).

3.4 DATA REVIEW AND VALIDATION

The QA Manager will supervise and/or perform data quality assessment tasks. Kleinfelder will review field and analytical laboratory data generated for this project, including the following:

- Field forms and chain of custody documentation;
- Laboratory batch QC frequency;
- Results of batch and field QC analyses; and
- Sample results influenced by outlier QC sample results.

3.5 DATA MANAGEMENT

Project data will be obtained and managed in accordance with Section B10 of the QA Program Plan (NDEP 2007).

3.6 ASSESSMENT OVERSIGHT

Kleinfelder will conduct at least one field audit during the life of the project. The field audit will be used to evaluate if the field personnel are following the procedures set forth in the FSP.

4 SAMPLING RATIONALE

4.1 SOIL SAMPLING

Due to the history of TPH and solvent use at the Site, a test pit excavation and soil sample collection should be performed to evaluate contaminant concentrations in soil. A minimum of ten test pits will be excavated, and the PSG data will be used to evaluate the need for additional test pit excavation and soil sample collection. Based on the results of the PSG survey, an additional eight test pits (maximum of 18 total test pits) may be excavated. If the PSG data do not identify TPH or VOC high mass areas, a minimum of ten test pits will be excavated. The locations of these ten test pits are shown on Figure 2.

Test pits 1 through 4 are located within the building footprints, at the known locations of former businesses that may have used or generated hazardous chemicals or waste. The presence of these businesses has been documented in the referenced Phase I ESAs (Robison Engineering Company, 2006A, 2006B, 2006C, 2007A, 2007B). Test pit 5 is located adjacent to a grease trap, where hazardous chemicals may have accumulated (due to illegal dumping) and/or leaked into soil. Test pits 6 through 10 are located adjacent to storm drain inlets in relative proximity to the businesses that may have used hazardous chemicals.

Up to eight additional test pits may be excavated, based on the results of the PSG survey (see Section 4.4). The additional test pits would be located within TPH or VOC high mass areas identified in the PSG survey.

4.2 PSG SAMPLING

The PSG sample locations (shown on Figure 3) were established using judgmental sampling to capture the perimeter of the Site, the building footprints, and storm drain utilities. The PSG survey will be performed prior to test pit excavation to assess TPH and VOC mass in soil vapor to evaluate the need for additional test pits. The PSG data are used as a cost-efficient, qualitative screening tool. Beacon will provide a color

contoured compound mass distribution map that may indicate areas of relatively higher mass. There are no established screening levels for PSG mass values, and they cannot be directly correlated to concentrations of a given analyte in soil.

Kleinfelder will discuss the PSG data with NDEP to evaluate whether additional test pits (up to eight) are warranted to assess soil at the locations of any identified high mass areas.

5 REQUEST FOR ANALYSES

5.1 ANALYSES NARRATIVE

All soil samples will be transported to Alpha Analytical Laboratories, Inc. (Alpha), located in Sparks, Nevada. The total number of soil samples collected will depend on the final number of test pits (between 10 and 18) and the number of soil samples collected from each test pit (up to a maximum of two).

Each soil sample will be analyzed for:

- TPH by EPA Method 8015;
- VOCs by EPA Method SW8260B;
- Resource Conservation and Recovery Act (RCRA) metals by EPA Method 300; and
- Ethylene glycol by modified EPA Method 8015.

The PSG modules will be shipped to Beacon for analysis. A total of 36 PSG sample modules (including two field blanks) will be submitted for analysis. The PSG sample modules will be analyzed for TPH (C5-C9 and C9-C15 range hydrocarbons) and VOCs by EPA method 8260C. A PSG survey analytical report, including contaminant mass distribution maps, will then be provided by Beacon.

5.2 ANALYTICAL LABORATORY

Alpha (for soil samples) and Beacon (for PSG samples) will generate all laboratory data. Alpha and Beacon procedures will conform with general laboratory quality control information is included in Section B 5.2 of the QA Program Plan. Regularly scheduled analyses of known duplicates, standards and spiked samples are routine aspects of laboratory data validation and reporting procedures. Data not meeting laboratory quality

control standards will be flagged accordingly. Sample reanalysis will be considered as a possible corrective action, if appropriate.

6 FIELD METHODS AND PROCEDURES

6.1 FIELD EQUIPMENT

6.1.1 List of Equipment Needed

A list of equipment needed for the PSG survey can be found in the *Beacon Field Kit Guide*, included as Appendix A of this FSP.

A list of equipment for soil sampling can be found in the standard operating procedures referenced in Appendix E of the QA Program Plan.

Field screening equipment will consist of a photoionization detector (PID) with a 10.6 electron volt (eV) lamp.

6.1.2 Calibration of Field Equipment

The PID will be the only instrument subject to calibration. The PID will be calibrated to 100 parts per million by volume (ppmv) of hexane using the manufacturer's instructions.

6.2 FIELD SCREENING

During excavation of the test pits, soil will be screened using a PID. A portion of each soil sample collected will be placed in a plastic bag and warmed inside a vehicle for approximately 10 minutes. After warming, a PID reading will be obtained from the head space in the bag. The ppmv readings will be recorded in field documentation.

Soil samples will also be screened using visual and olfactory methods. Any discoloration and/or petroleum odors will also be recorded in field documentation.

6.3 SOIL SAMPLING

Soil samples will be collected by personnel trained and experienced in collecting shallow soil samples for laboratory analysis. Soil samples will be collected using a stainless steel trowel from the test pit sidewalls, if safely accessible, or from the backhoe bucket. Soil samples will be placed in clean, laboratory provided glass jars. For the VOC analysis, a core-type sample container (Encore™ or equivalent) sample container will be utilized.

If no evidence of contamination is encountered (based on field screening), the test pit will be terminated at an approximate depth of 5 feet bgs. In this case, only one soil sample would be collected for analysis from the maximum depth of the test pit. If evidence of contamination is encountered, the test pit may be excavated to a maximum depth of 10 feet bgs to assess vertical extent. If the test pit extends beyond 5 feet bgs, two soil samples will be collected for analysis. The first soil sample would be collected from approximately 5 feet bgs and the second soil sample would be collected from the maximum depth excavated. However, the depth of the first soil sample may be adjusted to ensure that a soil sample be submitted from soil exhibiting the highest PID readings.

6.4 PSG SAMPLING

Installation of the PSG sample modules will be completed in accordance with Beacon's Field Kit Guide for Passive Soil-Gas Investigations (Appendix B). A portable generator will be used to power an electric rotary hammer, equipped with a 1.5-inch diameter drill bit to an initial depth of 12 inches bgs. Using a 0.75-inch diameter drill bit, the sample hole will then be advanced from 12-inches bgs to a total depth of approximately 34 inches bgs. Soil cuttings accumulated in the sample hole will be cleaned out using a wet-dry "shop-vac". A 1-inch diameter, 12-inch long metal sleeve will then be inserted into the 1.5-inch diameter portion of the sample hole until the top of the metal sleeve is approximately 0.5-inch bgs. Once the metal sleeve has been inserted, the sample module vial will be suspended, open end down, approximately 6 to 8-inches bgs. The metal sleeve will be covered with a patch of aluminum foil, and the sample hole will then be sealed with a 1-inch thick layer of grout.

Following installation of the PSG sample modules, Kleinfelder will survey each of the approximate 34 PSG sample locations using a Trimble Global Positioning System (GPS) unit, with a minimum of 0.1 foot accuracy. The GPS data will be provided to Beacon for use in the development of compound distribution maps.

The sample modules will be retrieved after a minimum of a 14-day exposure period. Each sample module will be capped, labeled with the sample number, date and time of installation and retrieval. Once the sample module has been retrieved and packaged, the sample hole will be filled with non-shrink grout.

6.5 DECONTAMINATION PROCEDURES

The decontamination procedures that will be followed are in accordance with approved SOPs referenced in Appendix E of the QA Program Plan. All equipment that comes into contact with potentially contaminated soil will be decontaminated prior to and after each sample collection. All sampling devices used, including trowels, will be decontaminated according to the following procedures:

1. Wash with liquinox and potable water.
2. Triple-rinse with potable water.
3. Final rinse using deionized/distilled water.

7 SAMPLE CONTAINERS, PRESERVATION AND STORAGE

7.1 SOIL SAMPLES

Soil samples will be collected in clean 4-oz glass jars provided by Alpha. Soil will also be collected using an Encore™ (or equivalent) container for VOC analysis. Immediately after collection, the samples will be chilled to 4° Celsius and stored in an iced cooler. The samples will also be placed in individual, sealable plastic bags. The coolers will be transported to Alpha under chain-of-custody protocol at the end of each field day.

7.2 PASSIVE SOIL GAS SAMPLES

PSG samples are collected using the PSG sample modules provided by Beacon. The PSG sample modules remain in individual, clean glass vials at all times. The glass vial is sealed using a storage cap, which is replaced by a screen mesh cap during deployment. Upon retrieval, the glass vial is again sealed using the storage cap. The PSG sample modules will then be placed in a storage box provided by Beacon, and shipped to Beacon under chain-of-custody protocol (once all sample modules have been retrieved).

8 DISPOSAL OF RESIDUAL MATERIALS

Investigative derived waste (IDW) is not anticipated to be generated, since the test pits will be backfilled with excavated soil.

9 SAMPLE DOCUMENTATION AND SHIPMENT

9.1 FIELD NOTES

All field activities will be documented on standardized Daily Field Forms. The following information will be recorded:

- Team members and their responsibilities;
- Time of arrival/entry on site and time of site departure;
- Other personnel on site;
- Deviations from sampling plans, site safety plans, and FSP procedures;
- Changes in personnel and responsibilities with reasons for the changes;
- Sample name, locations and descriptions, and;
- Weather conditions during field activities.

9.2 LABELING

All samples collected will be labeled in a clear and precise manner for proper identification in the field and for tracking in the laboratory. The samples will have pre-assigned, identifiable, and unique nomenclature.

Soil samples will be labeled as follows:

TP1-5'

- TP1: represents the test pit from which the soil sample has been collected
- 5': represents the depth at which the sample was collected (5 feet bgs)

PSG samples will be labeled as follows:

PSG-1

- PSG: represents “passive soil gas survey” sample
- 1: represents the PSG sample number/location, which will be mapped on the compound distribution maps prepared by Beacon.

9.3 SAMPLE CHAIN-OF-CUSTODY FORMS AND CUSTODY SEALS

Chain-of-custody forms will be provided by Alpha (for soil samples) and Beacon (for PSG sample modules). The chain-of-custody forms will include the laboratory identification number, sample location, sample media, parameter list (abbreviation for the list of analytes to be performed), sample date/time, and site ID. In addition, there are spaces for signatures of the persons relinquishing and receiving samples.

Custody seals will not be utilized for soil samples transported to Alpha. Custody seals, provided by Beacon, will be utilized on the shipping containers for PSG modules.

9.4 PACKAGING AND SHIPMENT

Soil samples stored in iced coolers will be transported to Alpha at the end of each field day.

PSG sample modules will be packaged using shipping containers provided by Beacon, and send via overnight delivery to Beacon in Bel Air, Maryland.

10 QUALITY CONTROL

10.1 FIELD QUALITY CONTROL SAMPLES

10.1.1 Assessment of Field Contamination (Blanks)

Field contamination is usually assessed through the collection of different types of blanks. The purpose for collecting field quality control samples such as trip blanks, rinsate blanks, and field duplicates are outlined in Sections B5 1.3 through B5 1.5 in the QA Program Plan.

10.1.1.1 Equipment (Rinsate) Blanks

One rinsate blank per day will be collected in the field during soil sample collection activities. The rinsate blanks will be collected by passing deionized water over the decontaminated sampling stainless steel trowel and collecting the water in appropriate sample containers. The rinsate blanks will be submitted for the same analysis as listed above for the soil samples.

10.1.1.2 Field Blanks

Two field blanks will be collected during the PSG survey at two separate locations. PSG sample modules will be exposed to ambient air, once during the installation process, and once during the removal process. This will replicate the PSG module exposure time during actual field activities. These field blanks will be submitted for analysis by Beacon.

10.1.1.3 Trip Blanks

One trip blank per cooler per day will be provided by Alpha, consisting of volatile organic analysis (VOA) vials filled with purged deionized water. These will be transported to the field and returned to the laboratory and submitted for VOC analysis by EPA Method SW8260B.

Two trip blanks will be provided by Beacon, consisting of sealed PSG sample modules. These will be kept with other PSG sample modules during installation, removals, and shipment. They will be submitted to Beacon for analysis.

10.1.1.4 Temperature Blanks

Alpha will provide temperature blanks (small water filled plastic containers) with each sample cooler. These will be used by Alpha to accurately measure temperature in the coolers once returned to the laboratory.

10.1.2 Assessment of Field Variability (Field Duplicates)

No field duplicates will be collected during soil sample collection activities, since soil is too heterogeneous to assess the precision of sample collection.

Each PSG sample module contains two sorbent units, but only one is normally used by Beacon for analysis. Analysis of the second sorbent unit will be requested from two randomly selected PSG sample modules. Analyses of these second sorbent units will serve as a field duplicates.

10.2 BACKGROUND SAMPLES

NA

11 FIELD VARIANCES

As conditions in the field may vary, it may become necessary to implement minor modifications to sampling as presented in this FSP. When appropriate, the QA Manager will be notified and a verbal approval will be obtained before implementing the changes. Modifications to the approved FSP will be documented in the sampling project report.

12 FIELD HEALTH AND SAFETY PROCEDURES

All work will be performed by following the safety procedures as outlined in the Health and Safety Plan. A copy of the Health and Safety Plan is included in Appendix B.

13 REFERENCES

NDEP, 2007. *Quality Assurance Program Plan for the Nevada Brownfields Program*, Nevada Division of Environmental Protection, May 20, 2007.

Robison Engineering Company, 2006A. *Phase I Environmental Site Assessment, 85 North Edison Way, Reno, Nevada*, Robison Engineering Company, January 18, 2006.

Robison Engineering Company, 2006B. *Phase I Environmental Site Assessment, 105 North Edison Way, Reno, Nevada*, Robison Engineering Company, March 16, 2006.

Robison Engineering Company, 2006C. *Phase I Environmental Site Assessment, 195 North Edison Way, Reno, Nevada*, Robison Engineering Company, March 16, 2006.

Robison Engineering Company, 2007A. *Phase I Environmental Site Assessment, 155 and 185 North Edison Way, Reno, Nevada*, Robison Engineering Company, February 22, 2007.

Robison Engineering Company, 2007B. *Phase I Environmental Site Assessment, 125 North Edison Way, Reno, Nevada*, Robison Engineering Company, June 7, 2007.

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TABLES

TABLE 1: DQO SUMMARY TABLE

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6	STEP 7
State the Problem	**Identify Goals and Decision Statements**	**Identify Inputs Needed**	**Define Study Boundaries**	**Develop Analytical Approach (Decision Rules)**	**Specify Acceptance Criteria (Tolerable Error Limits**	**Optimize Plan for Obtaining Data (Sampling Design)**
The site was used historically by several commercial and industrial businesses, including auto shops that may have used/generated hazardous chemicals/waste. The Phase I investigation identified TPH, VOCs, RCRA Metals and Ethylene Glycol as possible contaminants. PSG screening will be performed to guide the scope of soil assessment activities Soil samples will be collected from a minimum of ten test pits that will be excavated down to a maximum of 10 feet bgs. Additional test pits may be added depending on the PSG screening results.	Are there areas at the site where PSG screening indicates additional soil assessment is warranted? Do contaminant concentrations exceed Nevada action level (for TPH- 100 mg/Kg) or their respective screening levels (see Table 2 in the FSP)	Results of Phase I ESA Results of PSG screening Soil sample analytical results for possible contaminants. Soil samples will be collected from a minimum of 10 test pits, and up to 18 test pits (pending results of the PSG screening) Nevada action levels and other screening levels	Lateral boundaries include the Site boundaries shown on Figure 2. Vertical boundaries include subsurface soil from 0.5 feet to 10 feet deep. Temporal boundary is anticipated to be six week based on time needed to perform the PSG screening and the excavation and sampling of test pits .	If the results of the PSG screening indicate high-mass areas, additional test pits and soil sampling may be completed for these areas. There are no established screening levels for PSG mass values, and they cannot be directly correlated to concentrations of a given analyte in soil. Professional judgment will be used. If contaminant concentrations exceed the Nevada action level or screening levels, additional assessment and/or remediation may be warranted. (This step would be beyond the scope of this Field Sampling Plan and to be discussed with NDEP and TRFMA.)	The PSG data can only be used as a qualitative assessment and screening tool. Systematic random soil samples will be collected from test pit sidewalls and the concentrations compared to Nevada action levels. Each soil sample analytical result will be compared to the appropriate Nevada action level or screening level. MQOs for the analytical data are described in the QA Program Plan for the Nevada Brownfields Program.	The results of the PSG survey will be reviewed. Based on professional judgment, up to eight additional test pits may be installed to assess high-mass areas. Ten test pits will be located based on the known locations of businesses with potential use/generation of hazardous chemicals/waste, and storm drain inlets where illegal dumping may have occurred.

Notes: TPH= Total petroleum hydrocarbons VOCs= Volatile organic compounds RCRA= Resource Conservation and Recovery Act
bgs = Below ground surface DQO = Data quality objective MQO = Measurement quality objective
NDEP= Nevada Division of Environmental Protection TRFMA= Truckee River Flood Management Authority

Table 2: Analytes of Concern and Screening Levels (Soil)

Constituents	Lab Test Protocol	Screening Level*
TPH (Volatiles, Gasoline Range)	Modified EPA Method 8015	100 mg/kg **
TPH (Extractable; Diesel Range)		100 mg/kg **
TPH (Extractable; Oil Range)		100 mg/kg **
Ethylene Glycol	EPA Method 8015	120,000 mg/kg
RCRA Total (8)	EPA Method 6010/7470	
Arsenic		0.39 mg/kg
Lead		400 mg/kg
Silver		390 mg/kg
Barium		15,000 mg/kg
Cadmium		70 mg/kg
Chromium (total)		280 mg/kg
Selenium		380 mg/kg
Mercury		5.6 mg/kg
VOC	EPA Method 8260B	
Benzene		1.1 mg/kg
Toluene		5,000 mg/kg
Ethylbenzene		5.4 mg/kg
Total Xylene		630 mg/kg
Tetrachloroethene (PCE)		0.55 mg/kg
Trichloroethylene (TCE)		0.91 mg/kg
Remaining VOCs		Regional Screen Levels (RSLs) set by EPA Region 9

* Unless otherwise denoted, EPA Regional Screening Levels (Residential) have been used

** Nevada Division of Environmental Protection – Maximum Soil Screening Levels

mg/kg = milligrams per kilogram

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FIGURES

NOTE: Aerial Imagery from USGS National Map, accessed 12/31/2012.

LEGEND:

Approximate Site Boundary

N

500 250 0 500

APPROXIMATE SCALE (feet)

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DRAWN:	12/31/2012
DRAWN BY:	DFR
CHECKED BY:	DB

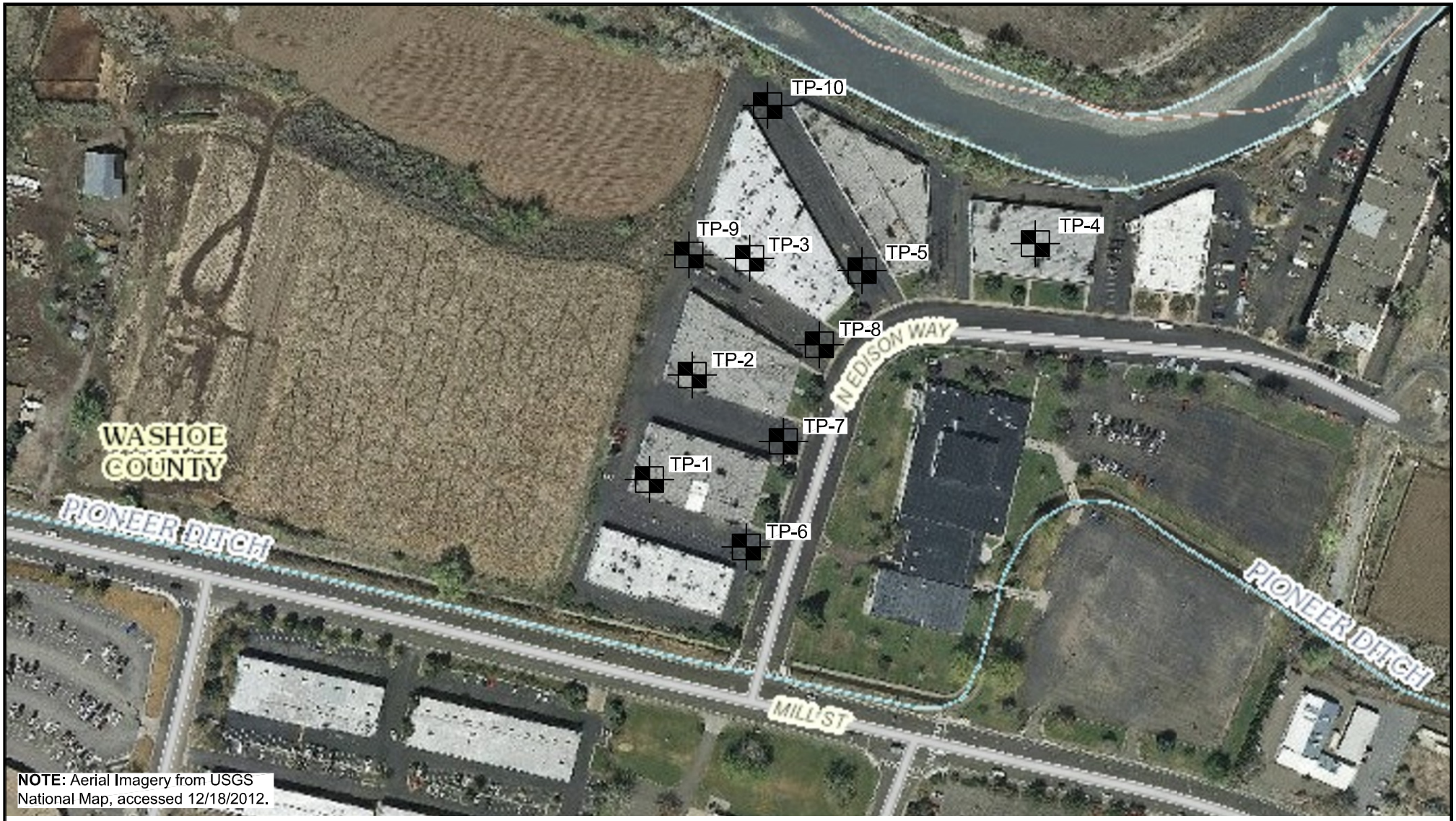
4853 LONGLEY LANE
RENO, NV 89502
(P) 775-689-7800 (F) 775-689-7810

Site Location

Reno, Nevada

FIGURE

1



NOTE: Aerial Imagery from USGS National Map, accessed 12/18/2012.

LEGEND:

TP-1 Approximate Test Pit Location

N

200 100 0 200

APPROXIMATE SCALE (feet)

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4853 LONGLEY LANE
RENO, NV 89502
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Proposed Test Pit Locations

85, 105, 125, 155, 185, and 195
North Edison Way

Reno, Nevada

FIGURE

2

NOTE: Aerial Imagery from USGS National Map, accessed 12/18/2012.

LEGEND:

- Approximate PSG Sample Locations

N

200 100 0 200

APPROXIMATE SCALE (feet)

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Proposed PSG Sample Locations

85, 105, 125, 155, 185, and 195
North Edison Way

Reno, Nevada

FIGURE

3

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ATTACHMENT A

FIELD KIT GUIDE
FOR
PASSIVE SOIL-GAS INVESTIGATIONS
[PLEASE READ ENTIRE GUIDE BEFORE STARTING SURVEY]

I. General Information

A. BEACON is furnishing this kit to **RMT, Inc.** (RMT) specifically for use on the **Tecumseh Products site in Tecumseh, MI.** To meet the project objectives the Samplers will be retrieved **seven (7) days after installation**. Please contact BEACON following installation of the samplers at (800) 878-5510 with anticipated date when samples will arrive at BEACON's laboratory.

B. Prior to returning the Kit to BEACON, RMT should verify that the caps are tight on the Passive Soil-Gas (PSG) Samplers and that the Samplers are sealed individually in the small Sampler Bags and also in the larger Return Shipment Bag, with an adsorbent pak.

C. ***Before going to the field*** please inventory the contents of the Kit, checking them against the enclosed list to verify item counts and to become familiar with all components. (Because the components are thoroughly cleaned prior to shipment, the inventory should be conducted without opening the plastic bags.) Note that Trip Blanks are to remain sealed throughout the Survey.

D. Upon receipt of the Field Kit, BEACON requests that RMT sign and date the enclosed Chain-of-Custody Form to document receipt of the Kit. The Field Deployment Report is to be completed during the course of the survey.

E. Following completion of the survey, fill out the Chain-of-Custody Form with the following information: (i) Field Sample IDs, (ii) the name and contact phone number of the person submitting the samples, (iii) the unique number of the custody seal that will be used, and (iv) signature and date of person relinquishing samples. The Chain-of-Custody Form and Field Deployment Report are to be returned with the Field Kit to BEACON. If possible, retain photocopies for your record. Next, pack the Samplers, tools, containers, sampling caps, and requisite documentation in the Field Kit.

Note: Place the Return Shipment Bag, which contains the individually bagged PSG Samplers, in the upper tray and place the tools in the lower compartment of the Kit so they do not damage the Samplers. One trip blank should be included with each Return Shipment Bag.

Affix the tug-tight custody seal to the latch on the Field Kit, pack it in its original cardboard shipping container, and send the shipment via overnight courier (FedEx, UPS, DHL) to:

Beacon Environmental Services, Inc.
Attn: Sample Receiving
323 Williams Street, Suite D
Bel Air, MD 21014
410-838-8780

NOTE: DO NOT PACK IN THE KIT OR SHIPPING BOX STYRENE PEANUTS, NEWSPAPER, OR OTHER MATERIALS THAT COULD CONTAMINATE THE SAMPLES. PLEASE AVOID SMOKING WHILE HANDLING SAMPLERS.

II. Contents

A. This Field Kit contains the components needed for a **148**-point soil-gas survey, plus sufficient additional cartridges for **5** trip blanks (vial labeled **Trip-1 through Trip-5**, not to be opened), and **4** extra Samplers for use in the event of breakage or accidental contamination. In addition, **3** extra transport vials are provided in case a Sampler Vial breaks during retrieval. **Do not open bags until deployment.**

Code/Item		Quantity
(1)	PASSIVE SOIL-GAS SAMPLERS	**157**
(2)	EXTRA TRANSPORT VIALS	**3**
(3)	SAMPLING CAPS (in container)	**160**
(4)	CAP STORAGE CONTAINERS	**2**
(5)	TAPPING DOWELS	**1**
(6)	12″ LENGTHS OF METAL PIPE	**152**
(7)	WIRE CUTTERS	**1**
(8)	GAUZE CLOTHS	**160**
(9)	PIPE CUTTER	**1**
(10)	SCRATCH AWL	**1**
(11)	VISE GRIPS	**1**
(12)	3” x 4” PLASTIC SAMPLER BAGS (for return shipment of samples)	**160**
(13)	12” x 12” PLASTIC RETURN SHIPMENT BAG	**1**

B. In addition to the materials found in the kit, field teams will need:

- NITRILE GLOVES
- CLEAN TOWEL
- HAMMER
- ELECTRIC ROTARY HAMMER DRILL WITH:
  ½”-DIAMETER BIT WITH AT LEAST 36 INCHES OF CUTTING LENGTH and
  1¼” to 1½” DIAMETER BIT WITH AT LEAST 12 INCHES OF CUTTING LENGTH
- PIPE WRENCH (to dislodge drill bits should they become stuck)
- BALL-POINT PEN and CLIPBOARD
- PIN FLAGS, WOODEN STAKES, or OTHER LOCATION MARKERS
- FLAGGING TAPE
- BOX OF ALUMINUM FOIL

C. Additional materials necessary only for deployment through asphalt or concrete:

- DRY CONCRETE MORTAR MIX and ASSOCIATED EQUIPMENT (for temporary patching of the sample holes) including:
  SMALL PAIL, WATER, SMALL PLASTIC PUTTY KNIFE
- CHISEL or SCREWDRIVER (to remove the temporary patch)
- ASPHALT COLD PATCH or CEMENT (for final repair of the sample holes)

III. Instructions

A. GENERAL:

Deployment and retrieval of Samplers requires only one person. Separate step-by-step procedures are detailed below for sampling through vegetation or bare soils and for sampling in areas covered by asphalt, concrete, or gravel. **Keep exposure of sample cartridges to ambient air to a minimum.**

Note: Do not deploy Samplers within 10 feet of a monitoring well, penetrometer, hydropunch shaft, or other intrusive sampling apparatus that potentially creates a preferential pathway for gases.

REMEMBER: TRIP BLANKS ARE NOT TO BE OPENED.

B. SAMPLER DEPLOYMENT:

Note: Each Sampler contains two sets of adsorbent cartridges. BEACON will analyze one set per Sampler; however, the second set in each Sampler can be analyzed as a field sample duplicate. RMT will note at which locations, if any, duplicates are to be analyzed by writing separate entries corresponding to the sample location followed by the letter "D" (*i.e*, 3, 3-D, 4, 4-D) on the Chain-of-Custody Form. It is not necessary to alter the deployment pattern to have the duplicate samples analyzed. There is an additional per sample charge for analysis of any duplicates.

Vegetation or Bare Soils:

1. At each survey point, clear vegetation as necessary and, using a hammer drill and drill bit, create a 1¼"- to 1½"-diameter hole approximately 12 inches deep. Then, using the ½" drill bit, extend the hole to a three foot depth. **Note**: In areas of very organic topsoil or landscaped areas (ie, mulched areas, gardens, etc.) it is important to get beneath the organic soil layer to the underlying soil below.

2. When the holes have been drilled, take a 12-inch length of 1"-diameter metal pipe and lower it into the sample hole, being careful not to touch the inside of the pipe. Any portion of pipe above grade is cut flush with the ground surface, using the pipe cutter. With the tapping dowel and a hammer, push or tap the pipe one inch into the base of the drilled hole (see **attached figure**).

3. Remove one of the Samplers (a glass vial containing four ***hydrophobic*** adsorbent cartridges) and unwind the retrieval wire wrapped around it. Holding the capped end of the vial in one hand, pull the wire tight (to straighten it) with the other hand. Remove the solid cap on the Sampler Vial and replace it with a Sampling Cap (a one-hole cap with a screen meshing insert). Place the solid cap in the Field Kit.

Note: At each sampling location, verify that the (black) sampling cap is on the vial before installing the Sampler.

4. Lower the Sampler, open-end down, into the metal pipe approximately four inches so that the retrieval wire sticks out of the hole. Cover the open end of the pipe with a balled up **wad** of aluminum foil, pressing it tightly on top of the pipe with the tapping dowel. Next, cover the hole to grade with local soils or sand, leaving the end of the wire exposed above the surface of the ground. Using the hammer, collapse the soils above the Sampler. **Coil the wire and lay it flat on the ground surface**. Place the solid cap in the Cap Storage Container. Clearly mark the sample location with a pin flag or wooden stake.

5. Close the Field Kit, and on the Field Deployment Report record: (a) sample-point number; (b) date/time of emplacement (to nearest minute); and (c) other relevant information (*e.g.*, soil type, vegetation, proximity to potential source areas). Mark the sample location and take detailed notes (*i.e.*, compass bearings and distances from fixed reference points).

6. Move to next location.

Concrete, Asphalt, or Gravel Covered Areas:

1. At each survey point, drill a 1¼"- to 1½"-diameter hole through the asphalt/concrete/gravel to bare soil using a rotary hammer drill or comparable equipment. This hole should be approximately 12 inches deep. **Note**: When one person is performing fieldwork, it is often more efficient to drill all sample-point holes before beginning Sampler deployment.

2. When the hole through concrete/asphalt/gravel has been completed, using the ½" drill bit, extend the hole to a three foot depth. Next, take a 12-inch length of 1"-diameter metal pipe and lower it into the sample hole, being careful not to touch the inside of the pipe. Any portion of pipe above grade is cut flush with the ground surface, using the pipe cutter. With the tapping dowel and a hammer, push or tap the pipe one inch into the base of the drilled hole (see **attached figure**).

3. Remove one of the Samplers (a glass vial containing four ***hydrophobic*** adsorbent cartridges) and unwind the retrieval wire approximately six inches from the sampler, so that a coil of wire remains at the end. Remove the solid cap on the Sampler Vial and replace it with a Sampling Cap (a one-hole cap with a screen meshing insert). Place the solid cap in the Field Kit.

Note: At each sampling location, verify that the (black) sampling cap is on the vial before installing the Sampler.

4. Lower the Sampler, open-end down, into the metal pipe approximately four inches.

   If sampling through asphalt or concrete, bend the end of the wire over the top of the pipe so that the coil of wire hangs over the top and outside of the pipe. Next, plug the top of the hole with a wad of aluminum foil. Using the tapping dowel, push down the aluminum foil so it forms a seal on the metal pipe and rests ¼" below the surfacing. Cover the hole to grade with a **¼" thick** concrete patch. [**Note**: A ¼" thick patch is all that is required. If it is thicker it will be difficult to remove during retrieval.] Next, place the solid cap in the Cap Storage Container.

   If sampling through gravel, extend the retrieval wire out of the pipe and plug the pipe with a wad of aluminum foil. Using the tapping dowel, push down the aluminum foil so it forms a seal on the metal pipe. Bend the wire over the aluminum foil plug and while the wire is extended out of the hole, cover the aluminum foil with local soil or sand. **Coil the wire and lay it flat on the ground surface.** Next, place the solid cap in the Cap Storage Container.

   If a hole deeper than 12 inches is created, it will be necessary to use more than one wad of aluminum foil. In these situations, extend the wire out of the pipe. While holding onto the wire, plug the top of the pipe and hole loosely with as many wads as needed. Before inserting the last wad of foil, bend the wire so it rests below the uppermost wad of foil. This will make it easy to retrieve the Sampler during retrieval.

5. Close the Field Kit, and on the Field Deployment Report record: (a) sample-point number; (b) date and time of emplacement (to nearest minute); (c) type of surfacing and approximate thickness; and (d) other relevant information (*e.g.*, surfacing material, proximity to potential source areas). Be sure to mark the sample location and take detailed notes (*i.e.*, compass bearings and distances from fixed reference points).

6. Move to next location.

C. SAMPLER RETRIEVAL:

Prior to retrieving samples, seal each Trip Blank in a 3"x4" Sampler Bag, and place the bagged Trip Blank in a separate larger bag marked "Return Shipment Bag." One trip blank should be included with each Return Shipment Bag. Stow the sampler blocks, with the Transport vials and extra samplers, in the lower compartment of the kit. The sampler blocks are to be returned to BEACON's lab along with the samples.

Note: Each Sampler contains two sets of adsorbent cartridges. BEACON will analyze one set per Sampler; however, the second set in each Sampler can be analyzed as a field sample duplicate. RMT will note at which locations, if any, duplicates are to be analyzed by writing separate entries corresponding to the sample location followed by the letter "D" (*i.e*, 3, 3-D, 4, 4-D) on the Chain-of-Custody Form. It is not necessary to alter the deployment pattern to have the duplicate samples analyzed. There is an additional per sample charge for analysis of any duplicates.

Vegetation or Bare Soils:

1. At each sample location open the Field Kit and place it and the wire cutters within easy reach. Remove a square of gauze cloth and place it and a clean towel on the open Kit. Remove a solid cap from the Cap Storage Container and place it on the Kit, also.

2. Remove the aluminum foil plug, using vise grips and the scratch awl, if necessary, and retrieve the Sampler from the hole.

3. Holding the Sampler upright, clean the sides of the vial with the clean towel (especially close to the Sampling Cap). Remove the Sampling Cap, cut the wire from the vial with the wire cutters, and clean the vial threads completely with the gauze cloth.
   [**Note**: **Completely remove the wire to ensure the cap fits tight on the vial and no soil is returned in the field kit**.]

4. Firmly screw the solid cap on the Sampler Vial and clean the vial completely with the gauze cloth. With a **ballpoint pen** record the sample number, corresponding to the sample location, on the cap's label. [**Note**: Do not use a Sharpie marker.]

5. Return the sampling cap to the Sampling Cap container. Place the sealed and labeled Sampler Vial in the smaller 3" x 4" plastic Sampler Bag. Then place the individually bagged and labeled sampler into the larger bag labeled "Return Shipment Bag."

   Note: Each sampler must be individually bagged and placed in a Return Shipment Bag, with approximately 40 samplers and one trip blank per Return Shipment Bag.

6. On the Field Deployment Report, record: (a) date and time of retrieval (to nearest minute); and (b) any other relevant information.

7. After all samples have been retrieved, verify that the caps on each Sampler are sealed tightly and that the seals on the Sampler Bags are closed. Verify that all Samplers are stored in the Return Shipment Bag, which contains an adsorbent pak. Seal the Return Shipment Bag and place it in the upper tray of the Field Kit, and place the provided tools and materials in the lower compartment of the Field Kit.

<u>Note</u>: Please do not return the sampling caps, used pipe, or the wire with the Field Kit as they could bias the samplers. Return *all* the other materials and equipment (blocks, extra samplers, tools, containers, *etc.*).

<u>Asphalt, Concrete, or Gravel:</u>

1. At each sample point covered by gravel, clear away the soil or sand to expose the aluminum-foil plug. For those locations covered by asphalt or concrete, use a small chisel and hammer to remove the concrete patch to expose the aluminum foil.

2. Next, open the Field Kit and place it and the wire cutters within easy reach. Remove a square of gauze cloth and place it and a clean towel on the open Kit. Remove a solid cap from the Cap Storage Container and place it on the Kit, also.

3. While securely holding onto the retrieval wire, remove the aluminum-foil plug, using the scratch awl, as necessary. Holding the Sampler upright, clean the sides of the vial with the clean towel (especially close to the Sampling Cap). Remove the Sampling Cap, cut all the wire from the vial with the wire cutters, and clean the vial threads completely with gauze cloth.
   [**Note**: **Completely remove the wire to ensure the cap fits tight on the vial and no soil is returned in the field kit**.]

4. Firmly screw the solid cap on the Sampler Vial and clean the vial completely with the gauze cloth. With a **ballpoint pen** record the sample number, corresponding to the sample location, on the cap's label. [**Note**: Do not use a Sharpie marker.]

5. Return the sampling cap to the Sampling Cap container. Place the sealed and labeled Sampler Vial in the smaller 3" x 4" plastic Sampler Bag. Then place the individually bagged and labeled sampler into the larger bag labeled "Return Shipment Bag."

   Note: Each sampler must be individually bagged and placed in a Return Shipment Bag, with approximately 40 samplers and one trip blank per Return Shipment Bag.

6. On the Field Deployment Report, record: (a) date and time of retrieval (to nearest minute); and (b) any other relevant information. Return the sampling cap to the Sampling Cap container.

7. After all samples have been retrieved, verify that the caps on each Sampler are sealed tightly and that the seals on the Sampler Bags are closed. Verify that all Samplers are stored in the Return Shipment Bag, which contains an adsorbent pak. Seal the Return Shipment Bag and place it in the upper tray of the Field Kit, and place the provided tools and materials in the lower compartment of the Field Kit.

<u>Note</u>: Please do not return the sampling caps, used pipe, or the wire with the Field Kit as they could bias the samplers. Return *all* the other materials and equipment (blocks, extra samplers, tools, containers, *etc.*).

8. Fill sampling holes to grade with an asphalt cold patch or cement.

IV. Forms

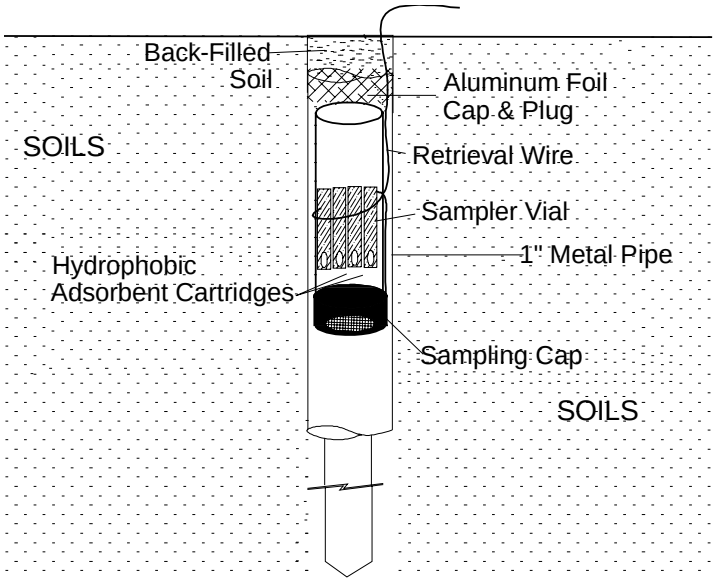
The Field Kit also contains a **Chain-of-Custody Form** and a **Field Deployment Report**.

A. The Chain-of-Custody Form is to be completed in accordance with **Section I**.

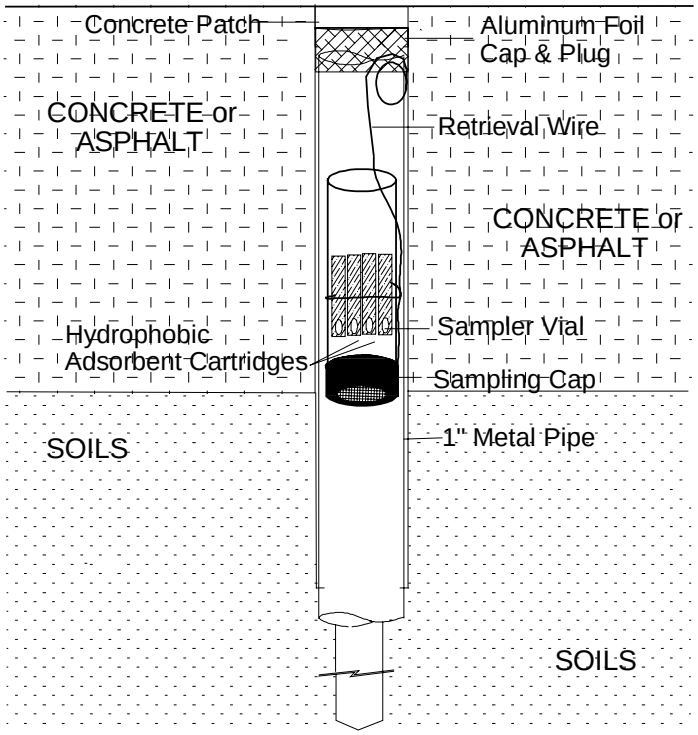
B. The Field Deployment Report is to be filled out during the Survey as indicated in **Section III**.

BEACON'S PASSIVE SOIL-GAS SAMPLER

DEPLOYMENT THROUGH SOILS



DEPLOYMENT THROUGH AN ASPHALT/CONCRETE CAP



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ATTACHMENT B

HEALTH AND SAFETY PLAN

Project No: 131379		**Date:**	January 14, 2013
Client	Truckee River Flood Management Authority	**Address:**	9390 Gateway Drive, Ste. 230, Reno, NV 89521
Site Contact:	Phil Tousignant	**Phone No.:**	775-742-4947
Job Location	85, 105, 125, 155, 185 and 195 North Edison Way, Reno, Nevada		

Work Objectives: Installation and Retrieval of passive soil gas sample modules (Beacon), followed by test pit excavation and soil sample collection.

Key Individuals:	**Project Manager:** Phil Tousignant, CEM
Site Health and Safety:	Phil Tousignant, CEM
Preparer:	Daniel Burns, CEM
Reviewer/Approver:	Josh Fortmann, CEM

Hospital/Clinic:	**Renown Regional Medical Center**		
Phone No:	775-982-4100		
Address:	1155 Mill Street, Reno NV- see map		
Paramedic 911	**Fire Dept. 911**	**Police Dept: 911**	

Emergency/Contingency Plans: Stop work, assess situation, call for assistance, apply first aid, and transport personal to hospital.

15 Minute Eyewash: _____ **Fire Extinguisher:** X **First Aid Kit:** X

Site Control Measures: Unauthorized personnel are not allowed on site or work area.

Personal Decontamination Procedures: Avoid skin, eye and mouth contact with any soil or liquid. Wash hands thoroughly with soap and water before eating/smoking.

CHEMICAL HAZARDS

SOIL AND GROUNDWATER:

Chemical Name *potential	Expected Soil/Water Concentration	Health Hazards
Petroleum	Unknown	Skin and respiratory irritant.
Volatile Organic Compounds	Unknown	Skin and respiratory irritant.

Cautions: Wash hands prior to eating or drinking.

HEALTH AND SAFETY PLAN

PHYSICAL HAZARDS

USA 1-800-227-2600

	Heat (Seasonal)	X	**Slip, Trip, Fall**	X	**Backhoe**
X	**Cold (Seasonal)**	X	**Noise**		**Drill Rig**
X	**Rain (Seasonal)**	X	**Underground Hazards**	X	**Excavations/Trench**
	Overhead Hazards				**Fog (Seasonal)**
X	**Heavy**		**Other:** Biological (i.e. scorpions, snakes, etc.)		
	equipment/vehicles				

PERSONAL PROTECTIVE EQUIPMENT R = Required A = As Needed

A	**Hard Hat**	R	**Safety Eyewear**
R	**Safety Boots: (Steel toe)**		**Respirator (Type):**
R	**Green/Orange Vest**		**Respirator Filter Type:**
A	**Hearing Protection**	A-R	**Gloves (Type): Neoprene, PVC, Nitrile**
	Tyvek Overalls		**Other:**
	5-Minute Escape Respirator		

MONITORING EQUIPMENT

	Organic Vapor Analyzer (FID)	X	**PID with lamp of:**	10.6 eV
	Oxygen Meter		**Draeger Tube:**	
	Combustible Gas Meter		**Passive Dosimeter**	
	H_2S Meter		**Air Sampling Pump**	
	W.B.G.T.		**Filter Media:**	

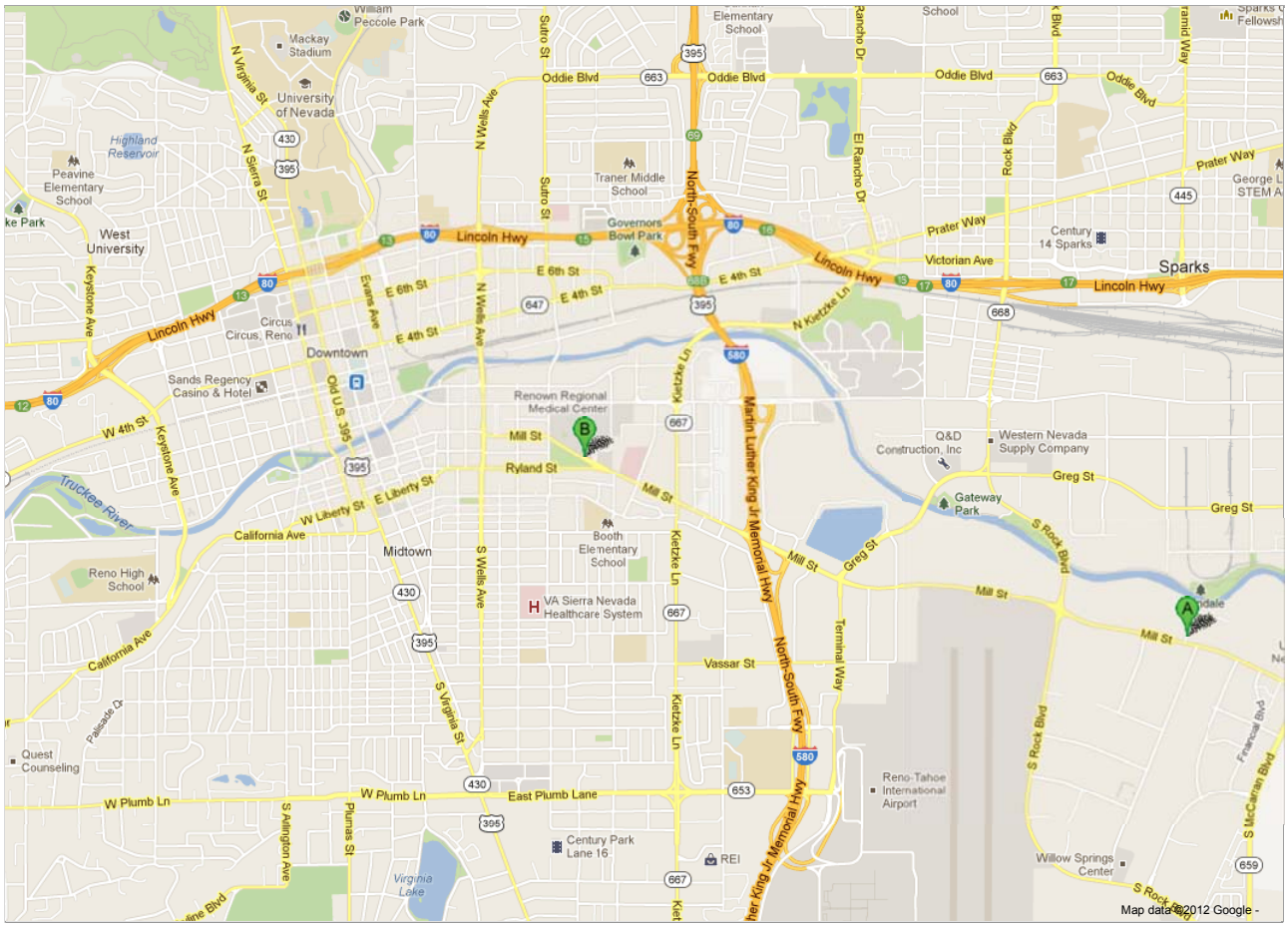
FOR ADDITIONAL SAFETY/HAZARD INFORMTION, REFER TO THE ATTACHED TASK-SPECIFIC JOB LOSS ANALYSIS FOR DRILLING SAFETY, TRENCH SAFETY, AND SAMPLING SAFETY.

ONSITE SAFETY MEETING ATTENDEES

Signature	Name (Printed)/Title	Date

To see all the details that are visible on the screen, use the "Print" link next to the map.

Google



Driving directions to Renown Regional Medical Center 3D

195 N Edison Way
Reno, NV 89502

1. Head **south** on **N Edison Way** toward **Mill St** 121 ft

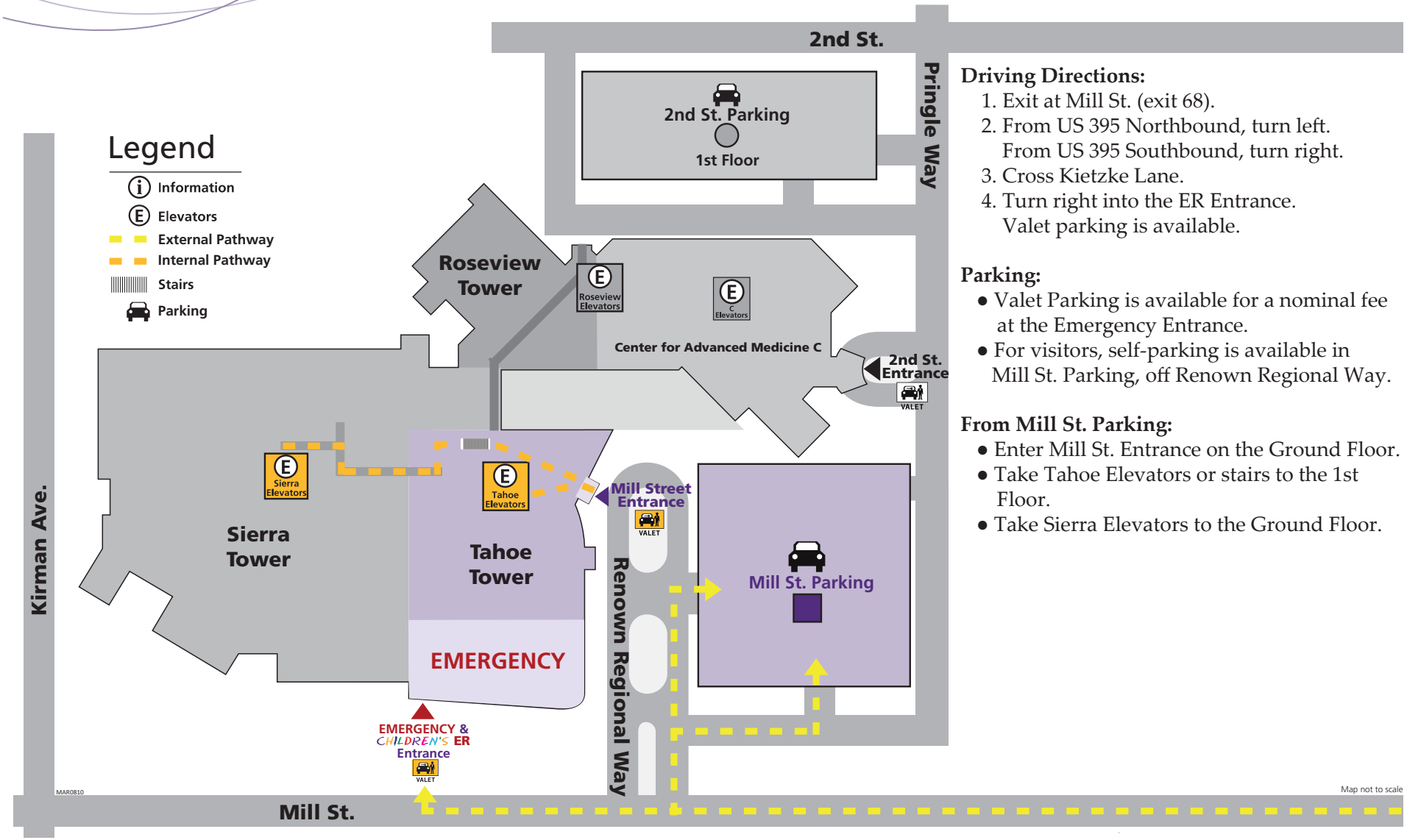
2. Turn right onto **Mill St**
Destination will be on the right 2.4 mi

Renown Regional Medical Center
1155 Mill Street
Reno, NV 89502

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Renown REGIONAL MEDICAL CENTER

Directions to the Emergency Room



Driving Directions:

1. Exit at Mill St. (exit 68).
2. From US 395 Northbound, turn left.
   From US 395 Southbound, turn right.
3. Cross Kietzke Lane.
4. Turn right into the ER Entrance.
   Valet parking is available.

Parking:

- Valet Parking is available for a nominal fee at the Emergency Entrance.
- For visitors, self-parking is available in Mill St. Parking, off Renown Regional Way.

From Mill St. Parking:

- Enter Mill St. Entrance on the Ground Floor.
- Take Tahoe Elevators or stairs to the 1st Floor.
- Take Sierra Elevators to the Ground Floor.

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Job Loss Analysis

Job Task	Portable Generator, Gasoline Powered				
Origination Date:	September 17, 2007	**Revision # 2**	**Revision Date:**	**December 10, 2012**	
Development Team:	Casey Majewski	**Review Team:**	Leslie Schultheis, David Jenkins	**Group:**	Environmental

Required Equipment for task (check specific job steps below for required PPE)

	Reflective Vest		Goggles		Supplied Air Respirator	x	Other:	LEL/CO detector, Hot work permit
	Hard Hat		Face Shield		Air Purifying Respirator		Client Specific:	
x	Steel Toed Boots		Life/Harness		Protective Clothing		Material:	
x	Safety Glasses	x	Hearing Protection	x	Gloves		Material:	Leather

Job Steps	Risks/Hazards	Quality/Safe Work Practices
1.Storage, Loading or unloading, transporting and placement of generator	Strains and sprains	Use the buddy system or mechanical means to load and unload the portable generator. Lift with load close to body, face load, feet shoulder width apart, keep back straight (don't bend over), bend knees and lift with good hand holds. Ask for help if load over 50 lbs.
	Pinch points	Don leather gloves when loading or unloading a portable generator. Be sure of adequate clearance of doors and openings to prevent getting caught between doors and the generator.
	Accumulation of hazardous vapors	Store Generators outside of occupied buildings assure that fuel line petcock is off to prevent leakage.
	Load movement during transport	Secure generator using cargo straps to prevent equipment. Assure load is tightly secured.
	Slips, Trips, and Falls	Plan the move prior to lifting making sure to remove any items that are in the planned path. Communicate to all affected site personnel your planned action.
	Spill	Inspect generator for leaks. Ensure generator is sitting up right during transportation and operation.
2. Set up	Electrical Shock	Plug appliances directly into the generator or use outdoor rated extension cords. Make sure the entire length of the extension cord is free from cuts or tears and the plug has all three prongs, especially a grounding pin. Use of Ground Fault Circuit Interrupters (GFCI) is required whenever a generator is used. Do NOT back feed power into a wall outlet.

Job Steps	Risks/Hazards	Quality/Safe Work Practices
	Inhalation of Carbon Monoxide	Generator should never be set up inside whenever possible. Use only extension cords rated for heavy duty (12 ga 3 wire are suitable). If portable generators are to be used indoors, contact your HSO to ensure adequate ventilation is provided and if necessary an air monitoring plan is designed and implemented. Air Monitoring is to include monitoring for CO as well as flammable or combustible vapors. Position Generator away from doors, windows, and intake vents of adjacent structures.
	Fire/ Explosion	Stage a 10 lb. ABC type fire extinguisher in the work area and remove all materials that present a fire hazard from the work area.
	Slips, Trips, and Falls	Ensure that extension cords do not pose a trip hazard in high traffic areas. Secure extension cords to the floor using an adhesive tape, or cord track.
	Spill	Inspect generator for leaks. Ensure the generator is started on an impervious surface prior to operation outside of a contained area. Place absorbent pads under the generator prior to startup and operation.
3. Fueling and Refueling	Fire/ Explosion	Before refueling the generator, turn it off and let it cool for a minimum of 15 minutes. Use a funnel to avoid spilling fuel onto hot engine parts always refuel in well ventilated area. Keep fuel at least 30 ft from generator during operation. Do not refuel near monitor wells or open storm drains.
	Spill	Ensure generator is placed on a level surface in a contained or impervious area. Place absorbent pads under the generator prior to fueling. Use a funnel when fueling.
4. Operation of the generator	Electrocution	Use a GFCI during operation. Assure that plugs are securely inserted into receptacle. Do NOT use multiple cords to complete run. Knot appliance with cord to prevent separation. Adhere to the manufacturers start up and shut down sequences.
	Struck by	Ensure that all guards are left in place and in working order.
	Noise	Don hearing protection (with attenuation of at least 25 dB) when working within 15 ft of generator.
	Fire/ Explosion	Complete a Hot Work Permit if potential for flammable combustible vapors exist.
	Current Overload	Assure generator is rated for potential Amperes draw.
	Spill	Place absorbent pads under the generator during operation. Inspect generator periodically for leaks while operating.

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Job Loss Analysis

Job Task	General Site Activities			
Publish Date:	**September 16, 2011**		**Origination Date:**	**June 30, 2006**
Group	Environmental; Materials	**Category**	General	
Development Team:	Jessica Hudson-Scientist, Danielle Digironimo-H&S Manager	**Latest Review Team:**	Chadd Fry-Scientist, Jenny Meyer-Senior H&S Manager	

Minimum Required Equipment (check all that apply)

X	Reflective Vest		Goggles		Supplied Air Respirator		Other:		
X	Hard Hat		Face Shield		Air Purifying Respirator		Cartridge:		
X	Steel Toed Boots		Life/Harness		Protective Clothing		Material:		
X	Safety Glasses		Hearing Protection	X	Gloves		Material:	Leather	
							Client Specific:		

Job Steps	Risks/Hazards	Quality/Safe Work Practices
1. Working in or around Noisy Equipment	Noise induced hearing loss/communication loss	Hearing protection must be donned when working around operating equipment if levels are greater than 85dBA. Typically when normal communication cannot be carried on at a distance of 3 feet, hearing protection is required. Establish hand signals for major activities (e.g., stop, dump, caution, go, etc.) Evaluate the need for dual hearing protection based upon equipment ratings and environmental conditions.
2. Working in Hot/Cold Environments	Heat/Cold stress	Implement a Heat/Cold Stress Program applicable to environmental conditions and use of PPE. Program should include; taking frequent breaks, buddy system, condition appropriate food/beverage consumption and getting wok done earlier or later in the day to avoid hottest/coldest parts of the day.
3. Working outdoors	Insect bites	Use insect repellants containing DEET for maximum protection.
	Poisonous Snake bites	Be alert, avoid approaching; wear snake chaps if high probability of poisonous snake inhabitation
	Encountering other wildlife	Be alert; do not approach; stay safe distance away; do not startle
	Contact with poisonous/irritating vegetation	Learn to recognize hazardous plants and avoid contact. If identified warn others of location.
	Sunburn	Use sunscreen with a minimum of 15 SPF
4. Working in Traffic Areas	On-Site traffic hazard, being hit by vehicles or equipment run over	Follow Traffic Control Devises and Traffic Flow Diagram. Set up work zones and direct traffic around areas where work will be performed.
	Pedestrian/unauthorized visitor entry to work area.	Notify all pedestrians that this is a work zone by delineating work zone and keeping watch. Delineate work area with snow fence or ridged barrier and/or caution tape to restrict access.

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Job Loss Analysis

Job Task	General Site Activities		
Publish Date:	**September 16, 2011**	**Origination Date:**	**June 30, 2006**
5. Moving vehicles and equipment	Hit by/striking another vehicle, property, or person	Use spotters when backing up vehicles and equipment. Spotters are required when backing, but they may be necessary for forward moving vehicles too. Inspect the work area by walking around the vehicle and equipment to identify any potential striking hazards. Insure back up alarms are functioning properly if vehicle or equipment is so equipped	
6. Working With Hand Tools	Misuse of hand tools could result in slips, trips, falls, abrasions, eye injuries and other common injuries.	Ensure proper training has been conducted prior to using a piece of equipment. Ensure proper inspection of said equipment prior to use. Mark all faulty equipment with red tag and remove from use until fixed. Wear appropriate PPE as required for the type of tool used.	
		Follow all housekeeping procedures and work zone delineation.	
	Hand abrasions, lacerations	Wear gloves appropriate to task--leather work gloves for general tasks, Nitrile gloves when handling contaminated materials, and cut resistant gloves when dealing with cut hazards associated with sharp/jagged objects.	
7. Working With and Sampling For Hazardous Chemicals/Materials	Cross-contamination of vehicles, persons, or belongings.	Follow the decontamination procedure listed in Section 12.0 in the Site H&S Procedure Manual.	
		Wear appropriate PPE at all times (listed above). Level D is the standard, upgrade when necessary to Level C. Contact H&S Officer before going to Level C.	
8. Working with Direct Reading Instruments.	Faulty readings/equipment	Ensure proper training has been conducted prior to using any DR Instruments. Such training includes proper equipment inspections and calibration.	
9. Walking/working surfaces	Slips/falls	Keep walking paths clear of debris/materials/equipment; ensure walking surfaces clear of ice, snow, or other slippery materials (i.e. oils, greases)	
	Trip hazards	Cover open holes/openings immediately; install well covers after sampling; level ruts or uneven ground as soon as possible	
	Being struck by sharp objects	If walking through undeveloped or highly developed areas of a Site with limited line of sight of the ground, move slowly and continuously check where you are stepping.	
10. Lifting/Carrying/Moving materials or objects	Hand abrasions, lacerations	Wear gloves appropriate to task--leather work gloves for general tasks, Nitrile gloves when handling contaminated materials, and Kevlar gloves when handling sharp/jagged objects.	
	Back Injuries	Do not lift objects >50 lbs. without assistance; use safe lifting/back safety techniques; use mechanical devices to aid or handle loads as much as possible	
11. Document Task Activity	Unable to prove through records that task performed as required	Complete task documentation legibly and in a timely manner	
12. Personnel trained/certified/qualified to perform task	Work is invalid as performed by person not trained/certified/qualified to perform task	Ensure have the correct certification and training to perform the assigned task	
13. Perform task according to approved plan/procedure	Perform wrong test/job function	Review work plan or other directing document before performing task	
	Miss a step or make a mistake while performing activity	Have copy of procedure/standard available while performing task	

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Job Loss Analysis

Job Task	General Site Activities		
Publish Date:	September 16, 2011	Origination Date:	June 30, 2006

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Job Loss Analysis

Job Task	Soil Sampling		
Publish Date:	April 20, 2007	Origination Date:	February 27, 2006
Group	Environmental	Category	
Development Team:	Daniel Raines	Latest Review Team:	Ann Harris, Jesse Vollick, Danielle DiGironimo, Sarah Burke

Minimum Required Equipment (check all that apply)

X	Reflective Vest		Goggles		Supplied Air Respirator		Other:		
X	Hard Hat		Face Shield		Air Purifying Respirator		Cartridge:		
X	Steel Toed Boots		Life/Harness		Protective Clothing		Material:		
X	Safety Glasses	X	Hearing Protection	X	Gloves		Material:	Nitrile, leather, kevlar	
							Client Specific:		

Job Steps	Risks/Hazards	Quality/Safe Work Practices
1. Preparing for soil sampling activity	Work-zone safety	Traffic flow/Work area positioning, signs, flags, cones and caution tape to define Work area. Barricades as needed.
		Leather gloves to protect against sign/equipment pinch-points.
		Hard Hat required if potential for overhead hazard exists
	Bottle ware safety (glass and preservatives)	Kevlar gloves when handling any Bottle ware
		Safety glasses to be worn at all times to protect against preservatives and debris. Nitrile gloves to prevent dermal contact.
	Excavation/trench hazards	Keep safe distances from Excavation/trench edges
	Heavy equipment locations	Keep safe distance from Heavy equipment pinch-points
		Make sure Heavy equipment operators are aware of activities at all times
2. Bottle ware Preparation	Cuts/Lacerations (glass Bottle ware)	Don Kevlar gloves under chemical resistant gloves
	Dermal/Eye burns (preservatives)	Nitrile gloves
		safety glasses
		Face shield (as necessary)
3. Observation of activities **(If activities are ongoing)	Noise	Hearing protection as required
	Debris	Safety glasses
		Face shield (as necessary)
	Pinch-Points (Machinery movement)	Make sure heavy equipment operators are aware of activities at ALL times
		**Refer to appropriate/alternate JSA for each separate ongoing activity!
4. Accessing soil sampling equipment (Split-Spoon or Stock-pile sample – Utilize applicable practices)	Dermal/Eye chemical exposure	Nitrile gloves (change as required/handling new material or sample)
		Safety glasses
		Face shield (as necessary)

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Job Loss Analysis

Job Task	Soil Sampling		
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	Cross-contamination	Leather gloves; Kevlar gloves	
		Notify ALL personnel in work area of intended movements within work area	
		Coordinate specific process for sample collection with heavy equipment operator	
	Movement within work area; Back-strain (Lifting/bending)	Utilize proper bending/lifting practices	
		Heavy objects require multiple personnel to lift	
	**Macrocore® opening	**Approved Macrocore® opening-tool only! (Internal blades with guard) Do not pull tool toward your body!	
	Pinch-points	Awareness of hand placement at all times	
5. Collection of Soil Sample	Abrasion/Laceration	Nitrile gloves (frequent changes) over top of Kevlar gloves	
	dermal/Eye chemical exposure	Safety glasses	
		Face shields (as necessary)	
	Cross-contamination	Notify ALL personnel in work area of intended movements within work area	
6. Securing Site/Departure (**If applicable to job)	pinch-points	Leather gloves	
	Traffic	Collection of traffic control equipment should be collected using caution while moving around the site	
	Back-strain	Proper lifting techniques	
	Equipment security	**All equipment is secured appropriately and at proper distances form excavations/trenches	
	Excavation/trench security	**Safe work-area delineation surrounding remaining excavations/trenches	
Document Task Activity	Unable to prove through records that task performed as required	Complete task documentation legibly and in a timely manner	
Personnel trained/certified/qualified to perform task	Work is invalid as performed by person not trained/certified/qualified to perform task	Ensure have the correct certification and training to perform the assigned task	
Perform task according to approved plan/procedure	Perform wrong test/job function	Review work plan or other directing document before performing task	
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