

Sampling and Analysis Plan  
for Waste Management Unit 7  
Administrative Order on  
Consent Activities

**NV Energy**  
Reid Gardner Station

**Final**  
December 2008  
20618.02



**Stanley Consultants** INC.

A Stanley Group Company  
Engineering, Environmental and Construction Services - Worldwide

## Certifications

### NVE Certification

I certify that this document and all attachments submitted to the Division were prepared under the direction or supervision of NVE in accordance with a system designed to gather and evaluate the information by appropriately qualified personnel. Based on my inquiry of the person or persons who manage the system(s) or those directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted and provided by NVE is, to the best of my knowledge and belief, true, accurate, and complete in all material respects. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Company: \_\_\_\_\_  
Date: \_\_\_\_\_

## Certified Environmental Manager Certification

I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been provided in a manner consistent with the current standards of the profession and to the best of my knowledge comply with all applicable federal, state and local statutes, regulations and ordinances. I hereby certify that all laboratory analytical data was generated by a laboratory certified by the NDEP for each constituent and media presented herein.

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EM Expiration Date: 9/30/2009

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# Section 1

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## Introduction

This Sampling Plan is being submitted to the Nevada Division of Environmental Protection (NDEP) in conformance with the Administrative Order on Consent (AOC) signed by NV Energy (NVE) and NDEP on February 22, 2008 regarding NVE's Reid Gardner Station (Station). The Station is a coal-fired electric power generation facility that produces approximately 600 MW of power from four generating units. The Station is located approximately 45 miles northeast of Las Vegas, within the Moapa Valley. The location of the site is shown on Figures 1 and 2 in Appendix A. The site was developed in 1964 and the Station became commercially operational in 1965.

This Sampling Plan specifically describes proposed soil sampling activities for Waste Management Unit 7 (WMU-7), which is located on the northeastern side of the Mesa Flyash Landfill, as shown on Figures 1 and 2 in Appendix A. WMU-7 reportedly acted as a landfill for Station municipal wastes prior to 1985. Most non-hazardous solid wastes generated in the early history of RGS (possibly as early as 1963) reportedly were disposed in this landfill.

The precise boundaries of WMU-7 are not known. However, boundaries were approximated in the *Reid Gardner Station Revised Hydrogeologic Characterization Report* by NVE, dated February 20, 2002, and the *Limited Site Characterization* by Converse Consultants dated February 15, 2006. The boundaries shown on Figures 1 and 2 in Appendix A are based on the characterization work conducted in 2005 by Converse Consultants. To better define the limits of WMU-7, eight soil borings will be advanced near or outside of the presumed boundary of the buried debris. This is discussed further in Section 4.

## Section 2

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### Background

Limited soil sampling and a ground penetrating radar (GPR) survey were conducted in the area of WMU-7 in November 2005 by Converse Consultants. The results were documented in the *Limited Site Characterization* dated February 15, 2006. The GPR survey covered an approximate area of 200 feet by 300 feet. The survey was performed continuously along north-south lines spaced 20 feet apart. Stakes were placed 25 feet apart in a north-south direction as reference points for the GPR survey output. The GPR survey indicated that the upper three feet of the surveyed area generally consists of soil and scattered debris. Large magnetic anomalies, such as metal drums, were not interpreted to be present. Optimum GPR resolution is typically obtained within 10 feet of ground surface, but can be less than five feet if adverse conditions (e.g., clayey soils and high moisture/groundwater) exist.

Also in November 2005, twelve soil borings (B-1 through B-12) were advanced in the area of WMU-7 at the locations shown on Figures 1 and 2 in Appendix A. The borings were advanced to depths ranging from approximately ten to 19 feet below ground surface (bgs) and were terminated once native geology was encountered. Debris including rags, plastic, metal, glass, and paper items was encountered in all of the borings, except B-1, B-10, and B-11, from the ground surface to approximately 11 feet bgs. Flyash discoloration was also encountered at varying depths in all of the borings. Native materials including sand, gravel, and cobbles were also encountered in all of the borings and appeared to be arranged in a manner consistent with materials used for periodic cover. Groundwater was not encountered in any of the borings.

Soil samples were collected for screening purposes from the cuttings from eight of the twelve soil borings and submitted to the laboratory to be analyzed for Total Petroleum Hydrocarbons (TPH), Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), Polychlorinated Biphenyls (PCBs), Dioxins, and RCRA Metals. Because the soil samples were not collected from specific depths, the vertical extent of contamination cannot be determined

from this sampling event. The sampling locations and analytical results are shown on Figure 1 in Appendix A and summarized in Table 1 in Appendix B.

The analytical results for total TPH were compared to the applicable soil action level of 100 milligrams per kilogram (mg/kg) pursuant to Nevada Administrative Code (NAC) 445A.2272. TPH concentrations in soil samples collected from B-6 (344 mg/kg), B-7 (161 mg/kg), B-8 (195 mg/kg), and B-9 (633 mg/kg) contained total TPH concentrations in excess of the total TPH soil action level.

Although dioxins were detected in all soil samples analyzed, none of the concentrations were in excess of the Agency for Toxic Substances & Disease Registry (ATSDR) Toxicity Equivalent (TEQ) for dioxin of 50 nanograms per kilogram (ng/kg). The highest concentration of total 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) equivalents was detected in B-7 at 45 ng/kg.

The results for all other analyses were compared to United States Environmental Protection Agency (USEPA) Region VI Medium Specific Screening Levels (MSSLs) per NDEP guidance letters dated April 21, 2008 and July 8, 2008. As noted in Table 1, several VOCs and SVOCs were detected in soil samples analyzed in 2005; however, the concentrations were below their respective MSSLs.

PCBs, specifically Aroclor 1254, were detected in one soil sample (B-7) at a concentration of 170 micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ). This is below the respective MSSLs for Industrial Soils.

All soil samples were analyzed for the eight RCRA metals. Arsenic, barium, cadmium, chromium, lead, mercury, and selenium were detected in one or more samples each while silver was not detected in any of the soil samples. Barium, cadmium, chromium, lead, mercury, and selenium were all detected at concentrations below their respective MSSLs for Industrial Soils. Arsenic was detected in every soil sample, except B-4, at concentrations ranging from 6.2 mg/kg to 11 mg/kg, above the MSSL for Industrial Soils.

Additional background information for the Station is available in the May 2008 Final Generic Quality Assurance Project Plan (QAPP).

### Data Quality Objectives

Because the GPR Survey and screening soil samples indicate the presence of buried debris and contaminant concentrations above screening levels for industrial soils, additional soil sampling is proposed. The purpose of this soil sampling effort is to confirm the boundaries of the buried debris in the area and delineate the horizontal and vertical extent of contamination above action levels in the WMU-7 area. These data will be used to evaluate the risk to human health and the environment in the WMU-7 area and to evaluate remedial alternatives.

Data quality objectives including data quality indicators, data review and validation, data management, and assessment oversight outlined in Sections A7.0 and C of the QAPP will be used.

### Sampling Rationale

To better define the limits of WMU-7, eight soil borings will be advanced near or outside of the presumed boundary of the buried debris, (S-1 through S-8 as shown on Figure 2 in Appendix A). These borings will be advanced until native geology is encountered or 30 feet bgs, whichever is shallower.

If buried debris is encountered in any of these soil borings, an additional soil boring will be advanced 50 feet away. This process will be continued until buried debris is not encountered in the soil boring or there are physical limitations to advancing additional soil borings. No soil samples will be collected from these borings and submitted for laboratory analysis.

Twelve soil borings are proposed within the WMU-7 area to a maximum depth of 30 feet bgs, or five feet into the native geology beneath the buried debris (whichever is shallower), at the approximate locations shown on Figure 2 in Appendix A (SB-1 through SB-12). The sample locations were chosen based on the results of the GPR Survey and the soil sampling activities conducted by Converse Consultants in 2005. The previous results show locations where buried debris was found and where contaminants were detected above screening levels. The proposed sample locations were selected to delineate the areal extent of contaminant concentrations above screening levels. The locations were also selected to confirm contaminant concentrations previously detected within the WMU-7 area. If the boundary of the buried debris described above is found to be significantly different than the presumed boundary, the sampling locations may be adjusted in the field. The boring depths were selected to allow for sampling of the native geology underlying the buried debris to evaluate whether contamination extends deeper than the area of the buried debris. In addition, surface soil sampling is included to gather data for calculating risks from direct contact with surface soils. The deeper soil samples will allow for calculating risks to workers from deeper contact with soil, such as from construction activities. Groundwater evaluation is not proposed as part of this investigation. Site-wide groundwater

issues will be addressed via separate investigations. Each soil sample will be analyzed for parameters discussed in Section 5 of this report.

### Request for Analyses

The initial soil borings to confirm the extent of buried debris in the area will not be submitted to a laboratory for chemical analysis. All additional soil samples collected at the site to determine vertical and lateral extent of contamination will be analyzed, where practicable, for parameters present on the Preliminary Site Related Chemicals (SRC) Document submitted to NDEP in November 2008. A table showing the proposed analyses is included in Appendix D.

### Field Methods and Procedures

The initial eight soil borings to confirm the extent of buried debris in the area will be advanced using a truck-mounted hollow-stem auger drilling machine (or equivalent). Soil samples will be continuously collected using a split spoon sampling device. Visual observations of the soil will be made to determine whether buried debris is present. The results will be recorded in the field logbook. Samples collected in these borings will not be field screened with a photo-ionization detector (PID) or submitted to a laboratory for chemical analysis.

The twelve borings to determine vertical and lateral extent of contamination will be advanced using a truck-mounted hollow-stem auger drilling machine (or equivalent). Soil samples will be continuously collected using a split spoon sampling device and field screened with a PID. In general accordance with Section B2.0 and United States Environmental Protection Agency (USEPA) Region 9 Laboratory Field Sampling Guidance Document #1205 (Soil Sampling) included in Appendix E (Standard Operating Procedures) of the generic Sampling and Analyses Plan presented in the Final Generic Quality Assurance Plan (QAPP) dated May 2008 and approved by the NDEP on July 17, 2008, soil samples will be collected as grab samples (independent, discrete samples). For the purpose of this work plan, up to three (3) discrete samples will be collected from each soil boring for laboratory analysis. One sample will be collected from the surface (within two feet of ground surface). One sample will be collected from each soil boring within the buried debris based on the Project Geologist's discretion (e.g., PID readings, visual or olfactory observations, etc.). If no buried debris is encountered, PID readings are at background levels, and there are no visual or olfactory indications of contamination, this soil sample will be collected between five to ten feet bgs. Finally, one soil sample will be collected in the native geology underneath the buried debris. Each soil sample will be analyzed for the SRC chemicals listed in Appendix D.

Soil samples will be collected using an acetate core inserted inside the split-spoon sampler. Samples to be analyzed for VOCs will be collected first as grab samples directly from the core.

The remainder of the core will be placed in a stainless steel bowl and homogenized with a stainless steel spoon. Material in the bowl will be transferred with a spoon from the bowl to the appropriate sample containers for SRC parameters listed in Appendix D. Sample containers will be filled to the top, taking care to prevent soil from remaining in the lid threads prior to being closed to prevent potential contaminant migration to or from the sample. Sample containers will be closed as soon as they are filled, chilled to 4 degrees Celsius, and processed for overnight shipment to the laboratory.

Decontamination of sampling equipment must be conducted consistently to assure the quality of samples collected. All equipment that comes into contact with potentially contaminated soil or water will be decontaminated prior to each use. Disposable equipment intended for one-time use will not be decontaminated, but will be packaged for appropriate disposal. All sampling devices used will be decontaminated in general accordance with Section B2.2.3 and USEPA Region 9 Laboratory Field Sampling Guidance Document #1230 (Sampling Equipment Decontamination) referenced in Appendix E of the Final QAPP, as summarized below:

- Non-phosphate detergent and tap water wash, using a brush if necessary to remove solid material
- Tap-water rinse
- 0.1 N nitric acid rinse
- Deionized/distilled water rinse
- Pesticide-grade solvent (reagent grade hexane) rinse
- Deionized/distilled water rinse (twice)

Equipment will be decontaminated in a designated area and the decontamination fluids will be collected for proper disposal. Clean equipment will be stored on plastic sheeting or wrapped in aluminum foil for storage prior to use.

Decontamination of equipment during the initial soil boring installations conducted to evaluate the extent of buried debris is not necessary because no samples will be collected for laboratory analysis. However, all augers and split spoons must be properly decontaminated and the drill rig will be steam cleaned prior to conducting soil borings for collecting soil samples for laboratory analysis.

## Sample Containers, Preservation, and Storage

The laboratory, ATL, will provide the appropriate sample containers and preservatives for the proposed sampling event. The sample containers, preservation, and storage will be as specified in Table 3 of the approved QAPP.

### Disposal of Residual Materials

Drill cuttings and decontamination fluids (Investigation Derived Waste –IDW) generated during drilling will be placed in drums that are visibly labeled and temporarily located on site. Off-site disposal of the IDW will be completed after the laboratory analysis results have been received. Additional analyses, if any, will be as required by the off-site disposal facility.

### Sample Documentation and Shipment

All documentation of the field activities will be as specified in Section A9.0 of the approved QAPP. Soil boring and sample locations will be recorded in the field logbook along with coordinates obtained with a handheld GPS unit as borings are completed. If possible, distances to the GPR Survey reference points will be given. The field PID screening results will be recorded in the logbook along with visual and olfactory observations. Soil boring logs will be prepared for each soil boring (including soil borings advanced to confirm the WMU-7 boundary) and included in the final report.

Sample handling and shipment will be as specified in Section B3.0 of the approved QAPP.

## Quality Control

Quality control measures will be taken in accordance with the Final QAPP dated May 2008 and approved by the NDEP on July 17, 2008. Discussion regarding the collection of Quality Control Samples (e.g. equipment blanks, duplicate samples, etc.) as well as the data validation process is discussed in more detail below.

### 10.1 Quality Control Samples

In accordance with the approved QAPP, the following Quality Control (QC) requirements pertain to soil samples.

AOC Implementation Activity	Agency	Frequency of Activity
Field Split	NDEP	Discretionary upon request of NDEP per Section B5.2.2.4 of the QAPP
Field Blank	Ninyo & Moore	1 per day or 5% of primary field samples (whichever is less) as specified in Section B5.2.2.1 of the QAPP
Equipment Rinsate Blank	Ninyo & Moore	1 per day or 5% of primary field samples (whichever is less) as specified in Section B5.2.2.1 of the QAPP
Blind & Field Replicate Sample	Ninyo & Moore	Not applicable soil sample analysis as specified in Section B5.2.2.3 of the QAPP
Trip Blank	Ninyo & Moore /ATL	One trip blank will be included with each shipping container transporting samples for VOC analysis as specified in Section B5.2.2.2 of the QAPP
Lab Reagent Blank	ATL	As specified in Section B5.3.7 of the QAPP
Method Blank	ATL	As specified in Section 6.2 of the ATL Quality Assurance Program Plan provided in Appendix C of the QAPP
Matrix Spike/Matrix Spike Duplicate	ATL	As specified in Section 6.2 of the ATL Quality Assurance Program Plan provided in Appendix C of the QAPP
Lab Control Sample	ATL	As specified in Section 6.2 of the ATL Quality Assurance Program Plan provided in Appendix C of the QAPP
General Bottle Control	ATL	Certified by Manufacturer

## 10.2 Data Usability/Validation

Per the request of NDEP and as stated in Section D2.0 of the approved QAPP, NV Energy will request a Tier 3 data package from the laboratory for 100% of the data generated from the background sampling activities. Data validation by a third party will be conducted in accordance with the NDEP Data Verification and Validation Requirements. Upon receipt of the data package(s), 100% of the data will be reviewed by a third party for the following components (where applicable):

- Completeness check
- Chain of custody (signatures, sample conditions, preservatives, sample handling/filtering)
- Holding times
- Random checks (10% - 20%) of initial and continuing calibration
- Review of quality control summaries including negative control (blanks) and positive control (LCS) along with sample specific controls (replicates, matrix spikes, surrogates, tracers/yields)
- Overall assessment

In addition to this 100% review, at least 10% of the data will be validated to the level of raw data. This validation will include the following items:

- 100% validation of initial and continuing calibration, including GC/MS tuning (data reporting forms)
- Random recalculation (10% - 20%) of reported results versus raw
- 100% validation of interference check sample (data reporting forms), ICP serial dilution (data reporting forms), GC/MS instrument performance check, reporting limits (ensure they include appropriate sample weights, moisture, dilution)
- Internal standards, compound identification, and tentatively identified compounds (TICs) (where appropriate)
- Random check (5%) of integration and mass spectrum matches (where available and appropriate)
- Overall assessment

Level 3 data validation is outlined in Section D2.0 and Appendix F of the approved QAPP. Due to the nature of the analysis, soil data for asbestos will not be validated by a third party validator.

## Section 11

### Field Variances

As conditions in the field may vary, it may be necessary to make minor modifications to the Sampling and Analysis Plan in the field. When appropriate, the QA Officer will be notified and verbal approval will be obtained before implementing the changes. Modifications to the approved Sampling and Analysis Plan will be documented in the WMU-7 Sampling Report.

### Field Health and Safety Procedures

A site-specific health and safety plan will be prepared for the WMU-7 soil sampling activities that is consistent with the General Health and Safety Plan dated March 2008 and accepted by NDEP on March 31, 2008. Field sampling activities will be conducted in accordance with this site-specific health and safety plan.

## Appendix A

### Site Figures

## Appendix B

### 2005 Sampling Data

Appendix C

USEPA Region 6 Human Health Medium-Specific  
Screening Levels 2008

## Appendix D

### Preliminary Site Related Chemicals List