BACKGROUND SOIL COMPILATION REPORT

BMI COMPLEX AND COMMON AREAS
CLARK COUNTY, NEVADA

Prepared for:
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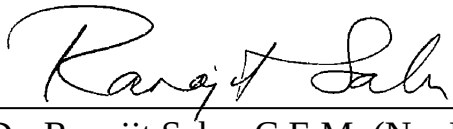
I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been provided in a manner consistent with the current standards of the profession and to the best of my knowledge comply with all applicable 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.



April 2, 2010

Dr. Ranajit Sahu, C.E.M. (No. EM-1699, Exp. 10/07/2011) Date
BRC Project Manager

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ABBREVIATION AND ACRONYM LIST

bgs	below ground surface
BMI	Basic Management, Inc.
BRC	Basic Remediation Company
DBSA	Daniel B Stevens & Associates
DOE	U.S. Department of Energy
DVSR	Data Validation Summary Report
Environ	Environ International Corporation
ERM	ERM-West, Inc.
NDEP	Nevada Division of Environmental Protection
Neptune	Neptune and Company, Inc.
QA/QC	quality assurance/quality control
Qal	Quaternary alluvium
QAPP	Quality Assurance Project Plan
SOP	standard operating procedure
TIMET	Titanium Metals Corporation
UMCf	Upper Muddy Creek formation
USEPA	U.S. Environmental Protection Agency

1.0 INTRODUCTION

On behalf of Basic Remediation Company (BRC), ERM-West, Inc. (ERM) has prepared this Background Soil Compilation Report applicable to the Basic Management, Inc. (BMI) Complex and Common Areas in Clark County, Nevada. Figure 1 shows features associated with the BMI Complex and Common Areas, and depicts the areas for which BRC has taken responsibility for remediation based on the *Settlement Agreement and Administrative Order on Consent: BMI Common Areas, Phase 3* (AOC3; boundary shown on Figure 1). For portions of the AOC3 area (*i.e.*, those areas denoted with blue shading) the Nevada Division of Environmental Protection (NDEP) has granted No Further Action Determinations (NFADs) for Site soils.[1] For the remaining portions of the AOC3 area (*i.e.*, areas denoted with green shading), the characterization, remediation, and closure process for Site soils is currently underway. For the purposes of this report, these latter (green) areas, excluding the Corrective Action Management Unit (CAMU) west of Boulder Highway, are defined as the "Site" (also referred to as "Eastside").

As described in the *BRC Closure Plan* for the BMI Common Areas (BRC *et al*. 2007; hereinafter "Closure Plan") BRC will compare residual chemical concentrations in Site soils to background concentrations as part of the risk assessment that will be performed during the closure process for each sub-area at the Site (sub-area boundaries depicted on Figure 1). Soil data have been collected by BRC and others during various sampling events to establish background conditions for the Site and BMI Complex. This report presents each of the background datasets that have been collected, and that may be used by BRC for closure purposes in risk assessments for the Site, and by others in areas throughout the region depicted in Figure 1.

The purpose of this report is to compile all of the various background investigations and datasets into a single document. It does provide general descriptive summary statistics for each of the stratigraphic units and depths profiles, as presented in each of the individual background investigation reports, but it does not present any comparative statistical analyses. Evaluation of the appropriate way(s) in which to use the data will be performed on a site-specific basis. Because of this, this report provides only general discussions regarding how and where these background datasets might be used. The user of these data should evaluate and select which is

[1] The following parcels have been granted an NFAD within the Eastside property; Nevada Power Substation (March 27, 2000), Parcel 4A (May 15, 2008), Parcel 4B (November 12, 2009), and Utility Corridor (October 19, 2009).

most appropriate for their particular site. In other words, data usability is the responsibility of the user of these data and is not discussed nor evaluated in this report.

This revision of the Background Compilation Report, Revision 1, incorporates comments received from the NDEP, on Revision 0 of the report, dated January 2010. The NDEP comments and BRC's response to these comments are included in Appendix A. Also included in Appendix A is a redline/strikeout version of the text showing the revisions from the January 2010 version of the report. An electronic version of the entire report, including original format files (MS Word and MS Excel) of all text and tables, as well as an electronic version of the background dataset are included in Appendix B.

2.0 BACKGROUND SOIL SAMPLING EVENTS

The areal extent of the Eastside and other Company properties in the Henderson area is fairly large (more than 3,700 acres), and the geologic strata vary across this region. As seen in Figure 2, the AOC3 area and adjacent BMI industrial complex are situated at the base of the River Mountains to the east and the McCullough Range to the southwest, which suggests that the soils in this area are derived from these two different sources.

This assumption is corroborated by the identification of "Pediment and fan deposits of the River Mountains" to the east and "Pediment and fan deposits of Henderson" to the south and west in regional geologic maps of the area (Nevada Bureau of Mines and Geology [NBMG] 1980). The mineralogical composition of the latter materials, which are noted in the geologic map as being derived from the McCullough Range, is "predominantly…dacite clasts," whereas the River Mountain-derived sediments are "dominantly…dacite clasts with locally high concentrations of basalt, tuff, and sedimentary clasts" (NBMG 1980). Given these differences, it follows that naturally-occurring background conditions vary across the Eastside and BMI Complex depending on the underlying geologic strata of a given area. Figure 3, which superimposes a recent aerial photograph over a soils map reproduced from the U.S. Department of Agriculture (USDA) Soil Survey Geographic (SSURGO) database, illustrates the variation in soil types across the entire area.

Given these geologic/soil composition variations, BRC and others undertook multiple field investigations to gather background data associated with a variety of geologic conditions in the Eastside and BMI Complex vicinity. The goal was to collect data pools suitable for use in background comparisons that would be performed in risk assessments for individual sub-areas within the Eastside and BMI Complex properties, This section discusses the following four field investigations during which background soil data relevant to the Eastside and BMI Complex were collected:

- A shallow background soil sampling event conducted in 2003 by Environ International Corporation (Environ) for the City of Henderson;
- A shallow background soil sampling event jointly conducted in 2005 by BRC and the Titanium Metals Corporation (TIMET);
- A supplemental shallow background soil sampling event conducted in 2008 by BRC; and
- A deep background soil sampling event conducted in 2008 by BRC.

These events are briefly described in the following sub-sections, and the associated sampling locations are depicted on Figures 2 and 3. For presentation clarity, the sample location identifiers included on these figures have been truncated for several of the sampling events, eliminating the naming convention prefix assigned during the associated event. For reference and to enable the reader to locate location-specific data in the database excerpt, the prefixes assigned during these events are provided in the Figure legends. For example, the green circular symbol on Figure 3 that is labeled "12" corresponds to sample location "BRC-BKG-12," which was collected during the 2005 BRC/TIMET investigation.

The detection frequencies for metals and radionuclides[2] evaluated during each of these investigations are presented in Table 1. It should be noted that for consistency with the *Background Shallow Soil Summary Report* (BRC and TIMET 2007), Table 1 combines the datasets derived from the 2003 City of Henderson investigation and the 2005 BMI/TIMET investigation. Even though the associated data represent the results of two separate studies, the conclusions of the 2007 BRC/TIMET report were that these datasets were comparable and could be combined for further statistical evaluation and comparisons. Detailed descriptions of the scope of work, sampling procedures, results, and data and statistical evaluations are provided in the associated reports listed in each section.

2.1 2003 CITY OF HENDERSON SAMPLING EVENT

During this sampling event, Environ collected samples from eight locations southwest of the Site (Figures 2 and 3, locations BG01 through BG08, yellow circular symbols), in accordance with a March 2002 work plan submitted to NDEP. These sample locations are presumed reflective of sediments derived from McCullough Range and/or the River Mountains[3] as follows:

McCullough Range Source
- BG01
- BG02
- BG03

River Mountain Source
- BG05
- BG06
- BG07
- BG08

Mixed Source
- BG04

[2] With NDEP concurrence, the project list of analytes was reduced in 2007 from 35 radionuclides to the following eight: uranium-238, uranium-233/234, thorium-230, and radium-226 (Uranium-238 Decay Chain), thorium-232, radium-228, and thorium-228 (Thorium-232 Decay Chain) and uranium-235/236 (Uranium-235 Decay Chain). Only these radionuclides are included in this Background Soil Compilation Report (and electronic dataset).

[3] This distinction between the various presumed sources was not made at the time of the 2003 study, but was done as part of the 2007 report for the 2005 BRC/TIMET background investigation (see Section 2.2).

Samples from (1) the 0 to 1 foot bgs interval; and (2) a deeper interval (ranging from 3 to 4 feet bgs) were collected from each boring. Sixteen (16) independent samples were collected during this event.[4] Sample analyses consisted of a suite of 24 metals[5] and 18 radionuclides. The scope and results of this field investigation were presented in Appendix E of *Risk Assessment for the Water Reclamation Facility Expansion Site, Henderson, Nevada* (Environ 2003*).*

As summarized in the report for the BRC/TIMET 2005 Shallow Soil Sampling Event (see Section 2.2 below), a quality assurance/quality control (QA/QC) review was conducted on this dataset by Neptune and Company, Inc. (Neptune; consultant for NDEP) upon direction by NDEP. It was not possible to conduct a full validation, as the analytical laboratory reports contained only QC summaries, and did not contain raw data, instrument calibration data, instrument reporting criteria, or internal standard data. Metals data were reviewed in accordance with the U.S. Environmental Protection Agency (USEPA) guidance document *U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (USEPA 2004a). Neptune used professional judgment and analytical method requirements for the radionuclide QA/QC review. The QA/QC review determined that the Environ dataset was usable for the intended purpose (*i.e.*, as background data) with the exception of the hexavalent chromium and radium-224, -226, and -228 data.

2.2 2005 SHALLOW BACKGROUND SOIL SAMPLING EVENT

This sampling event was conducted in accordance with the *Background Soil Sampling Workplan for BMI Common Areas and Complex Vicinity* (ERM and Tetra Tech 2005), which was approved with comments by the NDEP on May 27, 2005. That work plan was prepared and implemented jointly by BRC and TIMET, whose properties were located near each other and had similar geology and soil types. Since that time, TIMET has sold their property within the Eastside (the TIMET Ponds sub-area) to BRC. The scope and results of this field investigation, including a statistical analysis of the results, were presented in *Background Shallow Soil Summary Report – BMI Complex and Common Areas Vicinity* (BRC/TIMET 2007).

The general scope of work included the collection of soil samples from 11 locations on undeveloped properties upgradient of the Site (Figures 2 and 3, location IDs BRC-BKG-01 through -09, -11, and -12; green circular symbols). These samples were analyzed for metals and

[4] A field duplicate sample was also collected during this event, but was not included in the dataset.
[5] This suite of metals is a subset of those included in the list of Site-Related Chemicals that was subsequently established for the project (BRC *et al*. 2007).

radionuclides. With the exception of location BRC-BKG-12, all of these locations are presumed reflective of sediments derived from the McCullough Range. BRC-BKG-12 is located at the junction of McCullough and River derived sediments. Three borings were advanced at each location, and samples representative of (1) the 0 to 0.5 foot bgs interval; (2) the 4 to 6 foot bgs interval; and (3) the 9 to 11 foot bgs interval were collected from each boring. A total of 104 independent samples[6] and three split samples were collected during this event.

Sample analyses consisted of a full suite of metals (43 individual constituents, including all the metals in the current Site-Related Chemical list) and radionuclides (35 isomers). These analytes and methods were consistent with the BRC and TIMET site-related chemicals list and analytical program previously established for the BMI Common Areas project (BRC *et al*. 2007) and the TIMET site (Tetra Tech 2004). All radionuclide analyses underwent full dissolution preparatory methods.

The data were subjected to a data review consisting of full validation for 10 percent of the dataset, and partial validation for the remaining 90 percent. The results of that data review were presented in *Background Shallow Soil Summary Report – BMI Complex and Common Areas Vicinity* (BRC/TIMET 2007); approved by NDEP on July 7, 2007. Metals data were validated in accordance with the USEPA guidance document *U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (USEPA 2004a) and *Region 9 Superfund Data Evaluation/Validation Guidance* (USEPA 2001). USEPA has not standardized the validation of radionuclide data. Radionuclide validation was conducted using several documents, including the USEPA document *Multi-Agency Radiological Laboratory Analytical Protocols Manual (MARLAP)* (USEPA 2004b) the U.S. Department of Energy (DOE) reference document *Evaluation of Radiochemical Data Usability* (DOE 1997), and QC requirements and criteria summarized in the applicable methods.

2.3 2008 SUPPLEMENTAL SHALLOW BACKGROUND SOIL SAMPLING EVENT

This sampling event was conducted in accordance with the *Supplemental Background Shallow Soil Sampling and Analysis Plan – BMI Complex and Common Areas Vicinity, Clark County,*

[6] This sampling approach (11 locations, 3 borings at each, and 3 samples from each boring) would have resulted in a total of 99 samples. However, at location BRC-BKG-05, after collecting shallow soil samples a subsurface obstruction was encountered and the location was moved (step-out locations BRC-BKG-5AR, -5BR, and -5CR are not shown on the figures given the scale). The shallow samples from the initial BRC-BKG-05 sampling location (4 samples) were submitted for analysis as well as the samples from the step-out location. In addition, a fourth sample was collected from BRC-BKG-04, boring C. These extra five samples raised the tally to 104 samples.

Nevada (BRC 2008), which was approved by the NDEP in March 2008. The purpose of this investigation was to collect and analyze data for metals and radionuclides in background shallow soils that are comparable to site soils in geologic units not covered by the 2005 background dataset described above, specifically, sediments derived from the River Mountains. This supplemental background study was primarily undertaken because background comparisons for arsenic (using the then-available datasets) performed for both the Mohawk and Parcel 4B sub-areas indicated that arsenic was present at concentrations higher than background. However, there is no history of arsenic contamination at these sites; therefore, the supplemental shallow sampling was performed to explore the possibility that the eastern part of the site exhibits different background levels of arsenic and, potentially, other metals. The supplemental shallow soil background sampling event specifically targeted the lithologic units defined as "Pediment and fan deposits of the River Mountains" depicted as being located in the eastern-most corner of the Common Areas[7] in the NBMG geologic map (NBMG 1980). This part of Eastside is close to the northern part of the River Mountains range. The scope and results of this field investigation, including a statistical analysis of the results, were presented in *2008 Supplemental Shallow Soil Background Report - BMI Common Areas (Eastside), Clark County, Nevada* (BRC and ERM 2009a).

The scope of work included the collection of soil samples from 10 sampling locations adjacent to Lake Mead Parkway, on the south side of the roadway across from the Site. These 10 locations are shown on Figures 2 and 3 (location IDs BRC-BKG-R01 through -R10; orange circular symbols). Samples representative of (1) the 0 to 0.5 foot bgs interval; (2) the 4 to 6 foot bgs interval; and (3) the 9 to 11 foot bgs interval were collected from each boring. A total of 33 independent samples, including field duplicates, were collected during this event. The report entitled *Supplemental Shallow Background Data Set* (GES 2008), describes the drilling and sampling procedures, including detailed boring logs for each drilling location.

Sample analyses included a full suite of metals (38 individual metals[8]) and eight radionuclides (radium-226, radium-228, thorium-228, thorium-230, thorium-232, uranium-233/234, uranium-235/236, and uranium-238). These analytes and methods are consistent with the BRC site-related chemicals list and analytical program established in the *BRC Quality Assurance Project Plan* (QAPP; BRC and ERM 2009). All radionuclide analyses underwent full dissolution preparatory

[7] These units fall within the Mohawk sub-area and the eastern portion of Parcel 4B.
[8] As seen in Table 1, chloride, fluoride, nitrate, nitrite, and sulfate were included in the BRC/TIMET analytical suite, but were omitted from subsequent background investigations.

methods. All preparatory methods and analyses are consistent with the 2005 BRC/TIMET background dataset.

All of the data were subjected to a Level 3 review. In addition to the Level 3 review, 20 percent of all data collected during the course of the investigation were subjected to full Level 4 data validation. Level 3 and 4 reviews are provided in the *Data Validation Summary Report (DVSR)—2008 Supplemental Shallow Soil Background Sampling Event* (BRC and ERM 2008a; approved by NDEP on June 9, 2008). Metals data were validated in accordance with the USEPA guidance document *U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (USEPA 2004a) and the data validation standard operating procedure (SOP-40; BRC, ERM and MWH 2009). USEPA has not standardized the validation of radionuclide data. Radionuclide results for supplemental shallow background soil samples were validated in accordance with SOP-40 (BRC, ERM and MWH 2009) and the project QAPP (BRC and ERM 2009b).

2.4 2008 DEEP BACKGROUND SOIL SAMPLING EVENT

This sampling event was conducted in accordance with the *Revised Work Plan for Determination of Deep Quaternary Alluvium and Upper Muddy Creek Formation Background Soil Chemistry and Upgradient Alluvial Aquifer Conditions – BMI Common Areas and Complex Vicinity* (Daniel B Stevens & Associates [DBSA] 2007), which was approved by the NDEP on June 12, 2007. The primary purpose of this investigation was to collect and analyze data for metals and radionuclides in background deep soils that are comparable to Site soils in geologic units and depths not covered by the existing *Background Shallow Soil Summary Report* (BRC/TIMET 2007) and *2008 Supplemental Shallow Soil Background Report* (BRC and ERM 2009a) datasets, which address shallower (0 to 10 feet below ground surface [bgs]) stratigraphic intervals. The results of this field investigation, including all statistical analyses, were presented in *2008 Deep Soil Background Report - BMI Common Areas (Eastside), Clark County, Nevada* (BRC and ERM 2009c).

This deep background study was primarily undertaken because:

1) Insufficient background data exist to evaluate whether concentrations of metals and/or radionuclides in deeper Site samples statistically exceed concentrations of these constituents in background soils (*i.e.*, as would be determined from comparisons of Site data to background that will be conducted as part of the risk assessment for a given area, as discussed previously in this report); and

2) Insufficient background data exist for the Upper Muddy Creek formation (UMCf), which outcrops to the northeast of the Site. The UMCf is near the ground surface in certain areas of the Common Areas (*i.e.*, within the Western Hook sub-areas), but does not appear to outcrop within the Site. As presented in the two shallow background soil summary reports identified above (BRC/TIMET 2007; BRC and ERM 2009a), the existing datasets focused on shallow Quaternary alluvium (Qal) soils (*i.e.*, surface to 10 feet bgs) and did not include data for the UMCf.

The general scope of work included the collection of soil samples from 21 background areas upgradient of the BMI Complex and Common Areas and analysis of these samples for Site-related metals and radionuclides for determining background concentrations. These 21 locations (Figures 2 and 3; dark red circular symbols) are within map units 117, 182, and 184 with presumed source material as follows:

McCullough Range Source
- DBSA-01
- DBSA-02
- DBSA-03
- DBSA-04
- DBSA-08
- DBSA-09
- DBSA-10
- DBSA-11
- DBSA-13
- DBSA-14
- DBSA-15

River Mountain Source
- DBSA-23
- DBSA-26
- DBSA-27
- DBSA-29
- DBSA-30[9]
- DBSA-32
- DBSA-33

Mixed Source
- DBSA-17
- DBSA-20
- DBSA-21

The underlying UMCf was assumed to be the same unit across the study area, and all data collected from the UMCf were compiled into a single dataset.

[9] Original interpretation of the boring log for DBSA-30 indicated that the UMCf contact was identified based on the presence of clay at 148 feet bgs—accordingly, the 130 and 140 ft bgs samples were assigned to Qal/River. However, further scrutiny of the boring log reveals that soils overlying the clay UMCf are clayey sands with distinct clay beds, and may represent transitional UMCf. Based on this and the observed similarity in metal concentrations in the 130 ft bgs, 140 ft bgs, 150 ft bgs, and 160 ft bgs samples, data associated with the 130 ft bgs and 140 ft bgs samples were re-assigned to the UMCf dataset.

Soil samples were collected at 10-foot intervals at 21 sampling locations, from surface soil (0 to 0.5 feet bgs), to a maximum of 160 feet bgs. Of these samples, a subset was submitted for laboratory analysis. A total of 163 soil samples (79 from Qal-McCullough, 24 from Qal-Mixed, 36 from Qal-River, and 24 from UMCf) were collected and analyzed for metals and radionuclides as part of this investigation. The report entitled *Deep Background Investigation Report* (GES 2007), describes the drilling and sampling procedures, including detailed boring logs for each drilling location.

Sample analyses included a full suite of metals (38 individual metals), and eight radionuclides (radium-226, radium-228, thorium-228, thorium-230, thorium-232, uranium-233/234, uranium-235/236, and uranium-238). These analytes and methods are consistent with the BRC site-related chemicals list and analytical program previously established in the BRC QAPP (BRC and ERM 2009b). All radionuclide analyses underwent full dissolution preparatory methods. All preparatory methods and analyses are consistent with the 2005 BRC/TIMET background dataset.

All of the data were subjected to a Level 3 review. In addition to the Level 3 review, 20 percent of all data collected during the course of the investigation were subjected to full Level 4 data validation. Level 3 and 4 reviews are provided in the *Data Validation Summary Report (DVSR) - Deep Background Soil Investigation – August-October 2007 (Dataset 34c) – BMI Common Areas (Eastside), Clark County, Nevada* (BRC and ERM 2008b; approved by NDEP in June 25, 2008). Metals sample results were validated in accordance with *U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (USEPA 2004a). USEPA has not standardized the validation of radionuclide data. Radionuclide results for deep background soil samples were validated in accordance with SOP-40 (BRC, ERM and MWH 2009) and the project QAPP (BRC and ERM 2009b).

3.0 BACKGROUND SOIL DATASETS

The data generated from the background investigations listed in Section 2 have been assigned to the following datasets:

Depth Interval	Unit	Sample Locations (Event)
Shallow Qal Soil (0 to 10 ft bgs)	McCullough	BG01 through BG03 (2003 Environ dataset) BRC-BKG-01 through -09 and BRC-BKG -11 (2005 Shallow event);
	River – South[10]	BG05 through BG08 (2003 Environ dataset)
	River – North[10]	BRC-BKG-R01 through –R10 (2008 Supplemental Shallow event)
	Mixed	BG04 (2003 Environ dataset) BRC-BKG-12 (2005 Shallow event)
Deep Qal Soil (> 10 ft bgs)	McCullough	Samples from DBSA-01 through -04, DBSA-08 through -11, and DBSA-13 through -15 (2008 Deep Soil event)
	River	Samples from DBSA-23, DBSA-26 &-27, DBSA-29 & -30, and DBSA-32 & -33 (2008 Deep Soil event)
	Mixed	Samples from DBSA-17, DBSA-20 &-21 (2008 Deep Soil event)
UMCf	All Sources	Samples from DBSA-09, DBSA-11, DBSA-17, DBSA-20, DBSA-21, DBSA-23, DBSA-27, DBSA-30, DBSA-32, and DBSA-33 (2008 Deep Soil event)

To provide a general idea of the nature of the data (*e.g.*, reporting limit variations, detection frequency), descriptive summary statistics for various background datasets are presented in Tables 2 through 14. These tables represent various data combinations that could be applicable for background comparisons under different circumstances. Other groupings are also possible. Evaluation of the appropriate way(s) in which to use the data and the specific datasets to be used for a given sub-area will be performed on a sub-area-specific basis as part of each risk

[10] As discussed in the 2008 supplemental background report, there were distinct differences observed between the 2005 and 2008 shallow River datasets. Although it may be appropriate to perform comparisons of background to Site data using either the 2008 (North) River or the 2005 (South) River datasets, given the proximity of the 2008 River dataset to the Site, this is considered the more appropriate dataset for comparison purposes. Future use of the 2005 (South) River dataset is considered unlikely. Therefore, this dataset is not included in the general descriptive summary statistics in Tables 2 through 14.

assessment for closure purposes. The dataset groupings reflected in the summary tables are as follows:

Table 2	All Qal data, a 284-sample dataset combining data from all three Qal units (McCullough, Mixed and River) and all depths;
Table 3	Shallow Qal data, a 145-sample dataset combining data from all three Qal units (McCullough, Mixed and River) from depths of 0 to 10 feet bgs;
Table 4	Deep Qal data, a 139-sample dataset combining data from all three Qal units (McCullough, Mixed and River) from depths greater than 10 feet bgs;
Table 5	UMCf data, a 24-sample dataset combining all UMCf data from all locations, regardless of Qal association of shallower units;
Tables 6, 7, and 8, respectively	Datasets generated for each Qal unit, all depths (a 180-sample McCullough dataset, a 35-sample Mixed dataset, and a 69-sample River dataset);
Tables 9, 10, and 11, respectively	Datasets generated for each Qal unit, shallow data (0 to 10 feet bgs) (a 101-sample McCullough dataset, a 11-sample Mixed dataset, and a 33-sample River dataset); and
Tables 12, 13, and 14, respectively	Datasets generated for each Qal unit, deep data (>10 feet bgs) (a 79-sample McCullough dataset, a 24-sample Mixed dataset, and a 36-sample River dataset).

Appendix B contains an electronic version of all background data collected for the project. As noted in Section 1, the user of these data should evaluate and select which is most appropriate for their particular site. In other words, data usability is the responsibility of the user of these data and is not discussed nor evaluated in this report (except as noted in footnote 10).

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FIGURES

N

Las Vegas Wash Extent

CITY OF HENDERSON LANDFILL

Western Hook Development

Western Hook Open Space

CITY OF HENDERSON BIRD VIEWING PRESERVE

CITY OF HENDERSON WATER RECLAMATION FACILITY

CITY OF HENDERSON NORTHERN RIB PONDS

WESTON HILLS DEVELOPMENT

TUSCANY DEVELOPMENT

Galleria North

Historic Ditches

SUNSET ROAD

Sunset North

Upper Ponds

Mohawk

Utility Corridor

Spray Wheel

First Eight Rows

TIMET Ponds

Parcel 4B

Parcel 5/6

Trade Effluent Ponds

Staging

CITY OF HENDERSON SOUTHERN RIB

Southern RIBs

Parcel 9

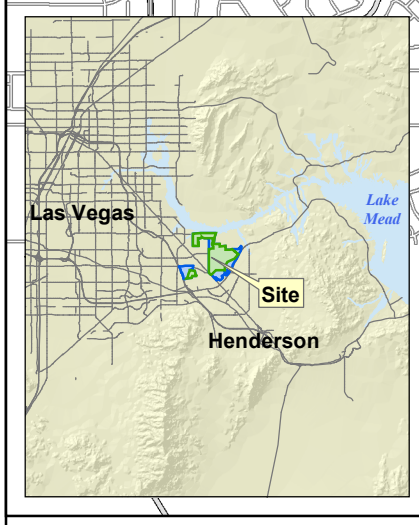
CORRECTIVE ACTION MANAGEMENT UNIT (CAMU)

BMI Siphon

Parcel 4A

LAKE MEAD PARKWAY

Industrial Facilities



2,000 1,000 0 2,000

Feet

Site Soil Boundary

Site AOC3 Boundary

Eastside Sub-Areas

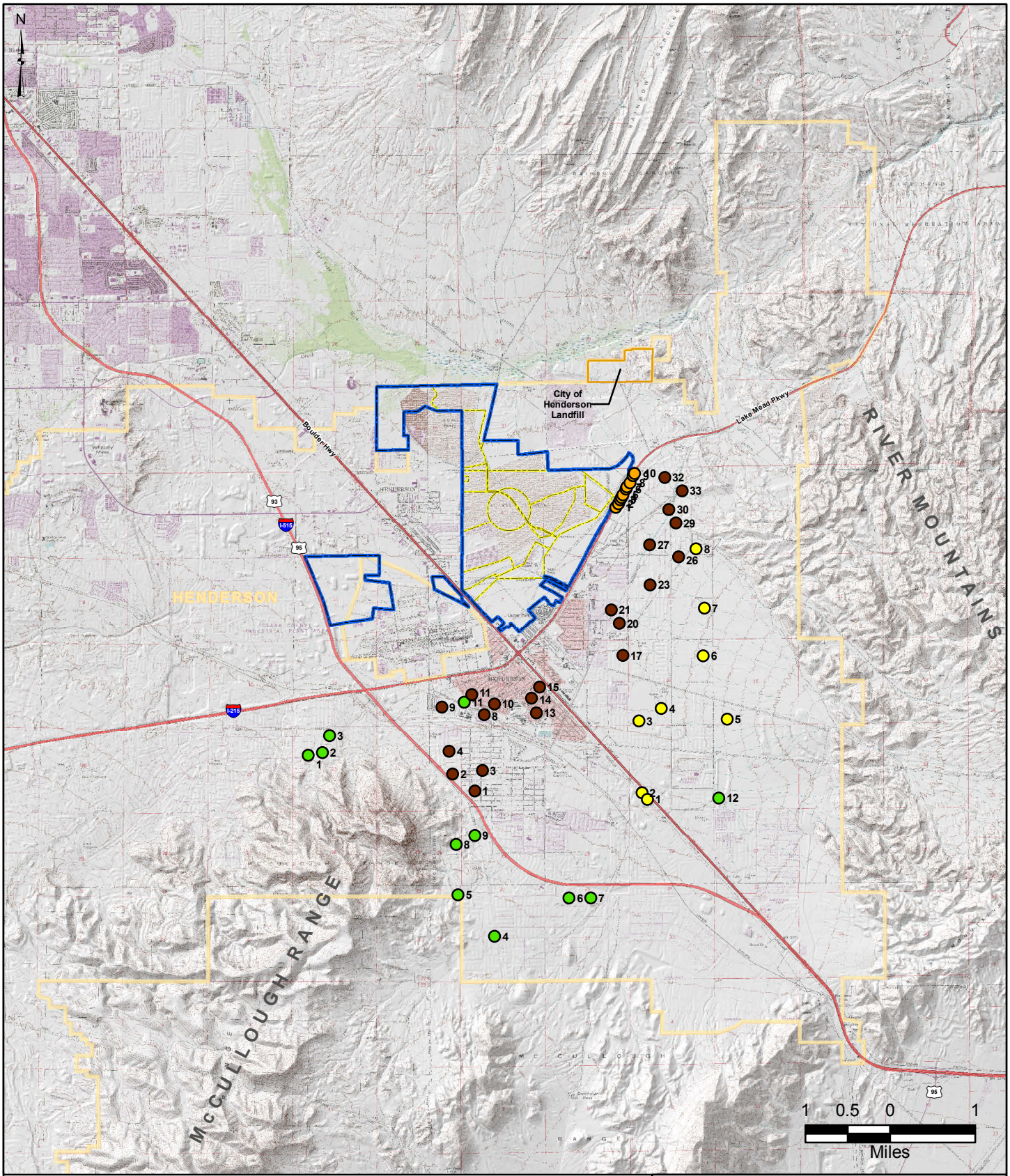
BMI Common Areas
Clark County, Nevada

FIGURE 1

SITE LOCATION MAP

Basic Remediation COMPANY

Prepared by		Date	JOB No. 0064276
MKJ (ERM)	ERM	04/02/10	FILE: GIS/BRC/BACKGROUND/FIGURE_1.MXD



Site AOC3 Boundary
Eastside Sub-Areas
City of Henderson Boundary

2008 Deep Background Sample Location (DBSA##)
2008 Supplemental Background Sample Location (BRC-BKG-R##)
2005 BRC/TIMET Background Sample Location (BRC-BKG-##)
2003 ENVIRON Background Sample Location (BG##)

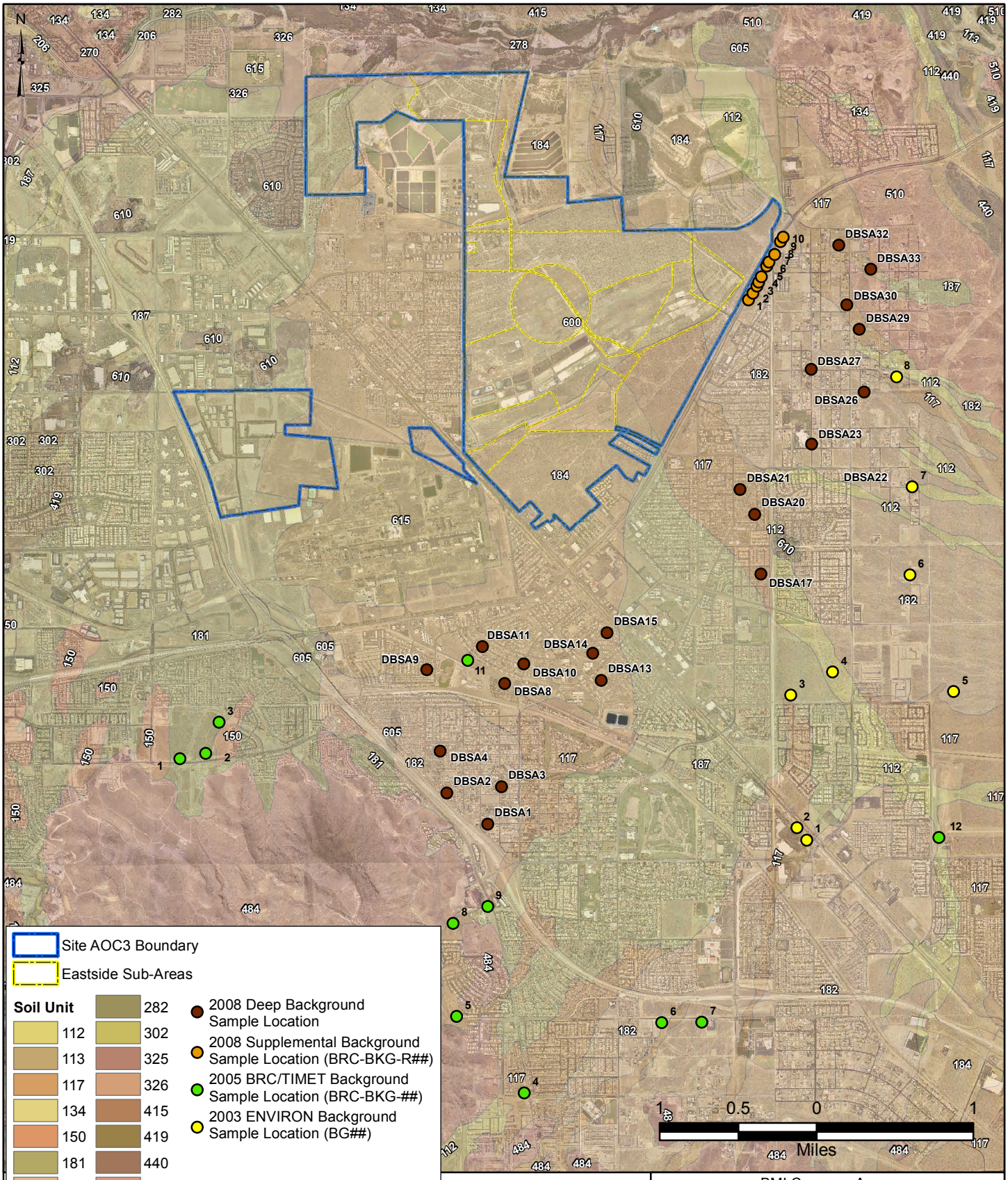
BMI Common Areas
Clark County, Nevada

FIGURE 2

REGIONAL TOPOGRAPHIC MAP AND BACKGROUND SAMPLE LOCATIONS

Basic Remediation Company

Prepared by	Date	JOB No. 0064276
MKJ (ERM)	04/02/10	FILE: GIS/BRC/BACKGROUND/FIGURE_2.MXD



Fall 2006 Aerial Photo.

BMI Common Areas
Clark County, Nevada

FIGURE 3

REGIONAL USDA SOILS MAP AND BACKGROUND SAMPLE LOCATIONS

Basic Remediation COMPANY

Prepared by		Date	JOB No. 0064276
MKJ (ERM)	ERM	04/02/10	FILE: GIS/BRC/BACKGROUND/FIGURE_3.MXD

TABLES

TABLE 1
DATASET ANALYTE LIST AND DETECTION FREQUENCY
BRC BACKGROUND SOIL COMPILATION REPORT
CLARK COUNTY, NEVADA
(Page 1 of 1)

Analyte Group	Analyte	2008 Deep (All Data)			2008 Supplemental Shallow			2005 BRC/TIMET Shallow[a]		
		Sample Size	No. of Detects	Detection Frequency	Sample Size	No. of Detects	Detection Frequency	Sample Size	No. of Detects	Detection Frequency
Metals (mg/kg)	Aluminum	163	163	100%	33	33	100%	120	120	100%
	Antimony	163	155	95.1%	33	13	39.4%	120	49	40.8%
	Arsenic	163	163	100%	33	33	100%	120	120	100%
	Barium	163	163	100%	33	33	100%	120	120	100%
	Beryllium	163	163	100%	33	33	100%	120	120	100%
	Boron	163	38	23.3%	33	15	45.5%	104	34	32.7%
	Cadmium	163	139	85.3%	33	21	63.6%	120	16	13.3%
	Calcium	163	163	100%	33	33	100%	104	104	100%
	Chloride	--	--	--	--	--	--	104	72	69.2%
	Chromium (Total)	163	163	100%	33	33	100%	120	120	100%
	Chromium (VI)	158	38	24.1%	33	0	0%	104	0	0%
	Cobalt	163	163	100%	33	33	100%	120	120	100%
	Copper	163	163	100%	33	33	100%	120	120	100%
	Fluoride	--	--	--	--	--	--	104	13	12.5%
	Iron	163	163	100%	33	33	100%	120	120	100%
	Lead	163	163	100%	33	33	100%	120	120	100%
	Lithium	163	151	92.6%	33	6	18.2%	104	104	100%
	Magnesium	163	163	100%	33	33	100%	120	120	100%
	Manganese	163	163	100%	33	33	100%	120	120	100%
	Mercury	151	55	36.4%	33	0	0%	120	93	77.5%
	Molybdenum	163	140	85.9%	33	33	100%	120	120	100%
	Nickel	163	163	100%	33	33	100%	120	120	100%
	Niobium	163	13	8.0%	33	1	3.0%	104	0	0%
	Nitrate	--	--	--	--	--	--	104	90	86.5%
	Nitrite	--	--	--	--	--	--	104	5	4.8%
	Palladium	163	163	100%	33	33	100%	104	104	100%
	Phosphorus	163	163	100%	33	33	100%	104	104	100%
	Platinum	163	9	5.5%	33	0	0%	104	5	4.8%
	Potassium	163	163	100%	33	33	100%	104	104	100%
	Selenium	163	0	0.0%	33	0	0%	120	52	43.3%
	Silicon	163	163	100%	33	33	100%	104	104	100%
	Silver	163	163	100%	33	14	42.4%	120	16	13.3%
	Sodium	163	163	100%	33	33	100%	104	104	100%
	Strontium	163	163	100%	33	33	100%	104	104	100%
	Sulfate	--	--	--	--	--	--	104	81	77.9%
	Thallium	163	4	2.5%	33	6	18.2%	120	42	35.0%
	Tin	163	127	77.9%	33	16	48.5%	104	103	99.0%
	Titanium	163	163	100%	33	33	100%	120	120	100%
	Tungsten	163	54	33.1%	33	2	6.1%	104	0	0%
	Uranium	163	163	100%	33	33	100%	103	103	100%
	Vanadium	163	163	100%	33	33	100%	120	120	100%
	Zinc	163	163	100%	33	33	100%	120	120	100%
	Zirconium	163	147	90.2%	33	13	39.4%	104	104	100%
Radionuclides (pCi/g)	Radium 226	125	121	96.8%	33	31	93.9%	104	96	92.3%
	Radium 228	124	122	98.4%	33	28	84.8%	84	68	81.0%
	Thorium-228	159	159	100%	33	33	100%	120	120	100%
	Thorium-230	159	159	100%	33	27	81.8%	120	120	100%
	Thorium-232	159	159	100%	33	33	100%	120	120	100%
	Uranium-233/234	141	126	89.4%	33	33	100%	120	61	50.8%
	Uranium-235/236	141	111	78.7%	33	11	33.3%	120	54	45.0%
	Uranium-238	141	124	87.9%	33	33	100%	120	120	100%

Notes:
[a]Combined 2003 Environ and 2005 BRC/TIMET background datasets.
mg/kg milligrams per kilogram
pCi/g picocuries per gram

TABLE 2
DESCRIPTIVE SUMMARY STATISTICS FOR BACKGROUND METALS AND RADIONUCLIDES – Qal (McCULLOUGH, MIXED AND RIVER, ALL DEPTHS)
BRC BACKGROUND SOIL COMPILATION REPORT
CLARK COUNTY, NEVADA

Analyte Group	Analyte	Sample Size	Detection Frequency	Censored (Non-Detect) Data							Detected Data						
				ND Count	Min	Q1	Median	Mean	Q3	Max	Detect Count	Min	Q1	Median	Mean	Q3	Max
Metals (mg/kg)	Aluminum	284	100.0%	0	--	--	--	--	--	--	284	3740	7130	8750	8950	10600	15500
	Antimony	284	68.3%	90	0.0394	0.126	0.33	0.241	0.33	0.3298	194	0.089	0.14	0.175	0.199	0.23	0.61
	Arsenic	284	100.0%	0	--	--	--	--	--	--	284	2.1	3.6	4.8	5.43	6.58	27.6
	Barium	284	100.0%	0	--	--	--	--	--	--	284	73	143	204	273	366	1350
	Beryllium	284	100.0%	0	--	--	--	--	--	--	284	0.16	0.45	0.54	0.539	0.61	0.89
	Boron	276	29.0%	196	2.824	2.82	2.82	3.31	3.2	6.6	80	3	5.63	6.6	7.85	8.28	57
	Cadmium	284	52.8%	134	0.01	0.129	0.129	0.105	0.129	0.1291	150	0.034	0.077	0.0905	0.096	0.11	0.26
	Calcium	276	100.0%	0	--	--	--	--	--	--	276	0.43	18400	23700	25900	31000	82800
	Chromium (Total)	284	100.0%	0	--	--	--	--	--	--	284	1.1	8.4	10.1	10.4	12.1	24.2
	Chromium (VI)	272	13.2%	236	0.16	0.17	0.25	0.246	0.26	0.56	36	0.16	0.205	0.28	0.401	0.448	1.6
	Cobalt	284	100.0%	0	--	--	--	--	--	--	284	3.5	5.4	7.25	7.32	8.9	16.3
	Copper	284	100.0%	0	--	--	--	--	--	--	284	8	12.7	15.7	15.5	18.1	36.2
	Iron	284	100.0%	0	--	--	--	--	--	--	284	5410	10900	13200	13200	15500	22500
	Lead	284	100.0%	0	--	--	--	--	--	--	284	3	6.7	9	10.1	11.5	53
	Lithium	276	85.9%	39	1.4628	3.66	3.66	7.91	14.6	36.57	237	7.5	13.1	17.4	19.5	23.2	124
	Magnesium	284	100.0%	0	--	--	--	--	--	--	284	1550	7440	9120	9230	10800	17500
	Manganese	284	100.0%	0	--	--	--	--	--	--	284	87.5	267	344	369	449	2070
	Mercury	276	48.9%	141	0.00668	0.00668	0.00668	0.00678	0.00668	0.0072	135	0.007	0.01	0.0141	0.0182	0.021	0.11
	Molybdenum	284	92.3%	22	0.1046	0.105	0.105	0.105	0.105	0.1046	262	0.17	0.41	0.52	0.607	0.7	2.3
	Nickel	284	100.0%	0	--	--	--	--	--	--	284	7.9	12.5	14.9	14.8	16.5	30
	Niobium	276	4.7%	263	1.015	1.02	1.51	1.5	1.51	3	13	1.7	2.7	3	3.13	3.55	4.6
	Palladium	276	100.0%	0	--	--	--	--	--	--	276	0.14	0.36	0.54	0.596	0.778	2.2
	Phosphorus	276	100.0%	0	--	--	--	--	--	--	276	296	894	1240	1210	1490	2010
	Platinum	276	4.3%	264	0.02	0.02	0.0333	0.0323	0.0435	0.048	12	0.022	0.025	0.0455	0.0483	0.064	0.099
	Potassium	276	100.0%	0	--	--	--	--	--	--	276	625	1340	1750	2250	2630	12600
	Selenium	284	16.5%	237	0.0467	0.158	0.32	0.275	0.32	0.36	47	0.1	0.26	0.3	0.312	0.36	0.6
	Silicon	276	100.0%	0	--	--	--	--	--	--	276	109	436	684	811	916	7480
	Silver	284	56.7%	123	0.11	0.261	0.261	0.238	0.261	0.2609	161	0.043	0.0875	0.12	0.198	0.19	2.2
	Sodium	276	100.0%	0	--	--	--	--	--	--	276	111	418	703	831	1030	4210
	Strontium	276	100.0%	0	--	--	--	--	--	--	276	69	177	243	265	319	808
	Thallium	284	15.5%	240	0.2	0.2	0.2	0.323	0.543	0.5428	44	0.12	0.355	1.1	0.968	1.48	2
	Tin	276	81.9%	50	0.0526	0.0526	0.0526	0.14	0.3	0.3	226	0.2	0.41	0.51	0.497	0.57	1
	Titanium	284	100.0%	0	--	--	--	--	--	--	284	200	447	545	551	659	1010
	Tungsten	276	18.5%	225	0.0175	0.0175	0.2	0.157	0.2	0.5	51	0.19	0.26	0.33	0.447	0.46	3.6
	Uranium	275	100.0%	0	--	--	--	--	--	--	275	0.43	0.9	1.1	1.21	1.4	4.3
	Vanadium	284	100.0%	0	--	--	--	--	--	--	284	19	31.1	37.1	38.2	43.9	73.3
	Zinc	284	100.0%	0	--	--	--	--	--	--	284	15.4	30.5	34.2	35.9	40.2	121
	Zirconium	276	87.0%	36	0.5	0.5	0.8	0.668	0.8	0.8	240	7.7	19.6	27.9	66.5	120	179
Radionuclides (pCi/g)[a]	Radium-226	244	99.2%	2	--	--	--	--	--	--	242	0.153	0.941	1.16	1.24	1.51	2.75
	Radium-228	223	97.3%	6	--	--	--	--	--	--	217	0.452	1.28	1.53	1.61	1.94	2.94
	Thorium-228	280	100.0%	0	--	--	--	--	--	--	280	0.944	1.45	1.66	1.68	1.9	3.37
	Thorium-230	280	97.9%	6	--	--	--	--	--	--	274	0.552	1.03	1.29	1.36	1.6	3.64
	Thorium-232	280	100.0%	0	--	--	--	--	--	--	280	0.898	1.37	1.52	1.55	1.74	2.8
	Uranium-233/234	266	97.4%	7	--	--	--	--	--	--	259	0.47	0.95	1.18	1.32	1.61	4.78
	Uranium-235/236	266	59.4%	108	--	--	--	--	--	--	158	-0.000681	0.042	0.059	0.066	0.0832	0.241
	Uranium-238	266	97.0%	8	--	--	--	--	--	--	258	0.545	0.94	1.14	1.24	1.47	4.01

Notes:

[a]Because both non-detect and detected radionuclides have reported activity levels, calculated summary statistics are presented as detected regardless of the lab detect flag. Lab detect flags are represented by the censored (non-detect) and detect count fields in the table.

mg/kg milligrams per kilogram
Max maximum concentration
Min minimum concentration
pCi/g picocuries per gram
Q1 1st quartile (25th percentile)
Q3 3rd quartile (75th percentile)

TABLE 3
DESCRIPTIVE SUMMARY STATISTICS FOR BACKGROUND METALS AND RADIONUCLIDES – Qal (McCULLOUGH, MIXED AND RIVER - 0 TO 10 FT BGS)
BRC BACKGROUND SOIL COMPILATION REPORT
CLARK COUNTY, NEVADA

Analyte Group	Analyte	Sample Size	Detection Frequency	Censored (Non-Detect) Data							Detected Data						
				ND Count	Min	Q1	Median	Mean	Q3	Max	Detect Count	Min	Q1	Median	Mean	Q3	Max
Metals (mg/kg)	Aluminum	145	100.0%	0	--	--	--	--	--	--	145	3740	6700	8620	9090	11400	15500
	Antimony	145	42.8%	83	0.0394	0.126	0.33	0.253	0.33	0.3298	62	0.12	0.17	0.235	0.256	0.32	0.61
	Arsenic	145	100.0%	0	--	--	--	--	--	--	145	2.1	3.55	4.4	5.2	6	27.6
	Barium	145	100.0%	0	--	--	--	--	--	--	145	73	152	211	269	323	836
	Beryllium	145	100.0%	0	--	--	--	--	--	--	145	0.16	0.42	0.5	0.543	0.665	0.89
	Boron	137	35.8%	88	3.2	3.2	3.2	3.9	3.2	6.6	49	5.2	6.05	7.5	8.99	8.95	57
	Cadmium	145	20.0%	116	0.04	0.129	0.129	0.12	0.129	0.1291	29	0.053	0.0885	0.11	0.119	0.14	0.26
	Calcium	137	100.0%	0	--	--	--	--	--	--	137	3430	18000	24500	28100	35400	82800
	Chromium (Total)	145	100.0%	0	--	--	--	--	--	--	145	2.6	7.05	9.1	9.43	11.5	23.6
	Chromium (VI)	137	0.0%	137	0.25	0.255	0.26	0.302	0.295	0.56	0	--	--	--	--	--	--
	Cobalt	145	100.0%	0	--	--	--	--	--	--	145	3.7	5.4	7.5	7.71	9.5	16.3
	Copper	145	100.0%	0	--	--	--	--	--	--	145	8	13	16.7	16.5	19.6	36.2
	Iron	145	100.0%	0	--	--	--	--	--	--	145	5410	9500	12400	12400	14900	21700
	Lead	145	100.0%	0	--	--	--	--	--	--	145	3	6.6	8.9	10.3	11.6	53
	Lithium	137	80.3%	27	3.657	3.66	7.31	9.89	14.6	36.57	110	7.5	10.9	13.1	14.9	17.3	41.8
	Magnesium	145	100.0%	0	--	--	--	--	--	--	145	1550	7050	9190	9420	11700	17500
	Manganese	145	100.0%	0	--	--	--	--	--	--	145	151	303	398	422	491	2070
	Mercury	145	58.6%	60	0.00668	0.00668	0.00668	0.00691	0.0072	0.0072	85	0.0084	0.012	0.017	0.0218	0.027	0.11
	Molybdenum	145	100.0%	0	--	--	--	--	--	--	145	0.17	0.415	0.52	0.616	0.72	2.3
	Nickel	145	100.0%	0	--	--	--	--	--	--	145	7.9	11.4	14.8	14.8	17.5	30
	Niobium	137	0.7%	136	1.015	1.02	1.02	1.48	1.02	3	1	4.6	--	4.6	4.6	--	4.6
	Palladium	137	100.0%	0	--	--	--	--	--	--	137	0.14	0.315	0.47	0.54	0.72	1.6
	Phosphorus	137	100.0%	0	--	--	--	--	--	--	137	296	943	1300	1270	1600	2010
	Platinum	137	3.6%	132	0.0435	0.0435	0.0435	0.0446	0.0469	0.048	5	0.045	0.0545	0.064	0.0708	0.0905	0.099
	Potassium	137	100.0%	0	--	--	--	--	--	--	137	625	1280	1750	2160	2520	9000
	Selenium	145	32.4%	98	0.0467	0.158	0.158	0.211	0.32	0.32	47	0.1	0.26	0.3	0.312	0.36	0.6
	Silicon	137	100.0%	0	--	--	--	--	--	--	137	335	609	798	1090	1220	7480
	Silver	145	15.2%	123	0.11	0.261	0.261	0.238	0.261	0.2609	22	0.043	0.0555	0.0725	0.081	0.087	0.17
	Sodium	137	100.0%	0	--	--	--	--	--	--	137	111	292	568	748	878	4210
	Strontium	137	100.0%	0	--	--	--	--	--	--	137	69	148	219	264	363	808
	Thallium	145	27.6%	105	0.3	0.3	0.543	0.48	0.543	0.5428	40	0.12	0.443	1.15	1.04	1.5	2
	Tin	137	86.9%	18	0.187	0.3	0.3	0.294	0.3	0.3	119	0.2	0.39	0.48	0.48	0.56	1
	Titanium	145	100.0%	0	--	--	--	--	--	--	145	200	378	495	498	594	1010
	Tungsten	137	1.5%	135	0.0175	0.0175	0.0175	0.128	0.0175	0.5	2	0.96	--	0.98	0.98	--	1
	Uranium	136	100.0%	0	--	--	--	--	--	--	136	0.43	0.793	0.94	1.04	1.1	4.3
	Vanadium	145	100.0%	0	--	--	--	--	--	--	145	19	28.1	34.2	35.3	42	59.1
	Zinc	145	100.0%	0	--	--	--	--	--	--	145	15.4	29.4	37.3	37.5	43.2	121
	Zirconium	137	85.4%	20	0.8	0.8	0.8	0.8	0.8	0.8	117	9.1	103	121	114	142	179
Radionuclides (pCi/g)[a]	Radium-226	137	98.5%	2	--	--	--	--	--	--	135	0.153	0.875	1.06	1.11	1.27	2.75
	Radium-228	117	95.7%	5	--	--	--	--	--	--	112	0.573	1.43	1.86	1.81	2.11	2.94
	Thorium-228	145	100.0%	0	--	--	--	--	--	--	145	1.1	1.46	1.72	1.73	1.93	3.37
	Thorium-230	145	95.9%	6	--	--	--	--	--	--	139	0.66	1.01	1.2	1.31	1.5	3.64
	Thorium-232	145	100.0%	0	--	--	--	--	--	--	145	1.05	1.4	1.57	1.61	1.8	2.8
	Uranium-233/234	145	100.0%	0	--	--	--	--	--	--	145	0.47	0.85	1.04	1.21	1.31	4.78
	Uranium-235/236	145	42.1%	84	--	--	--	--	--	--	61	0.0009	0.0475	0.064	0.0761	0.0987	0.241
	Uranium-238	145	100.0%	0	--	--	--	--	--	--	145	0.545	0.86	1.02	1.13	1.26	4.01

Notes:

[a]Because both non-detect and detected radionuclides have reported activity levels, calculated summary statistics are presented as detected regardless of the lab detect flag. Lab detect flags are represented by the censored (non-detect) and detect count fields in the table.

mg/kg milligrams per kilogram
Max maximum concentration
Min minimum concentration
pCi/g picocuries per gram
Q1 1st quartile (25th percentile)
Q3 3rd quartile (75th percentile)

TABLE 4
DESCRIPTIVE SUMMARY STATISTICS FOR BACKGROUND METALS AND RADIONUCLIDES – Qal (McCULLOUGH, MIXED AND RIVER >10 FT BGS)
BRC BACKGROUND SOIL COMPILATION REPORT
CLARK COUNTY, NEVADA

Analyte Group	Analyte	Sample Size	Detection Frequency	Censored (Non-Detect) Data							Detected Data						
				ND Count	Min	Q1	Median	Mean	Q3	Max	Detect Count	Min	Q1	Median	Mean	Q3	Max
Metals (mg/kg)	Aluminum	139	100.0%	0	--	--	--	--	--	--	139	5060	7600	8780	8810	9920	15100
	Antimony	139	95.0%	7	0.1046	0.105	0.105	0.105	0.105	0.1046	132	0.089	0.14	0.16	0.172	0.2	0.37
	Arsenic	139	100.0%	0	--	--	--	--	--	--	139	2.2	3.7	5.4	5.66	7.3	13.9
	Barium	139	100.0%	0	--	--	--	--	--	--	139	84.7	134	191	278	399	1350
	Beryllium	139	100.0%	0	--	--	--	--	--	--	139	0.29	0.49	0.54	0.534	0.59	0.73
	Boron	139	22.3%	108	2.824	2.82	2.82	2.82	2.82	2.824	31	3	4.5	5.8	6.05	6.4	24.1
	Cadmium	139	87.1%	18	0.01	0.01	0.01	0.01	0.01	0.01	121	0.034	0.076	0.086	0.0904	0.105	0.16
	Calcium	139	100.0%	0	--	--	--	--	--	--	139	0.43	18700	23200	23800	29100	46600
	Chromium (Total)	139	100.0%	0	--	--	--	--	--	--	139	1.1	9.5	10.6	11.4	13.1	24.2
	Chromium (VI)	135	26.7%	99	0.16	0.17	0.17	0.169	0.17	0.2	36	0.16	0.205	0.28	0.401	0.448	1.6
	Cobalt	139	100.0%	0	--	--	--	--	--	--	139	3.5	5.4	7	6.91	7.9	12.9
	Copper	139	100.0%	0	--	--	--	--	--	--	139	8	12.3	15.4	14.5	16.7	24
	Iron	139	100.0%	0	--	--	--	--	--	--	139	7250	11900	14100	14100	15800	22500
	Lead	139	100.0%	0	--	--	--	--	--	--	139	4.9	6.8	9	9.92	11.4	35.1
	Lithium	139	91.4%	12	1.4628	3.66	3.66	3.47	3.66	3.657	127	7.5	17.4	20.8	23.4	26.4	124
	Magnesium	139	100.0%	0	--	--	--	--	--	--	139	4990	7700	9040	9030	10200	13900
	Manganese	139	100.0%	0	--	--	--	--	--	--	139	87.5	246	297	314	368	836
	Mercury	131	38.2%	81	0.00668	0.00668	0.00668	0.00668	0.00668	0.00668	50	0.007	0.00848	0.0102	0.012	0.0144	0.0254
	Molybdenum	139	84.2%	22	0.1046	0.105	0.105	0.105	0.105	0.1046	117	0.26	0.4	0.52	0.595	0.68	1.9
	Nickel	139	100.0%	0	--	--	--	--	--	--	139	8.5	13.5	14.9	14.8	15.9	27.5
	Niobium	139	8.6%	127	1.5118	1.51	1.51	1.51	1.51	1.5118	12	1.7	2.65	3	3.01	3.48	3.8
	Palladium	139	100.0%	0	--	--	--	--	--	--	139	0.2	0.43	0.61	0.651	0.8	2.2
	Phosphorus	139	100.0%	0	--	--	--	--	--	--	139	511	892	1180	1150	1410	1930
	Platinum	139	5.0%	132	0.02	0.02	0.02	0.02	0.02	0.023	7	0.022	0.023	0.025	0.0323	0.046	0.049
	Potassium	139	100.0%	0	--	--	--	--	--	--	139	850	1380	1750	2330	2720	12600
	Selenium	139	0.0%	139	0.32	0.32	0.32	0.32	0.32	0.36	0	--	--	--	--	--	--
	Silicon	139	100.0%	0	--	--	--	--	--	--	139	109	249	510	536	766	1340
	Silver	139	100.0%	0	--	--	--	--	--	--	139	0.046	0.097	0.13	0.216	0.2	2.2
	Sodium	139	100.0%	0	--	--	--	--	--	--	139	235	567	781	912	1100	3250
	Strontium	139	100.0%	0	--	--	--	--	--	--	139	123	206	249	266	300	793
	Thallium	139	2.9%	135	0.2	0.2	0.2	0.2	0.2	0.23	4	0.15	0.163	0.21	0.228	0.31	0.34
	Tin	139	77.0%	32	0.0526	0.0526	0.0526	0.0528	0.0526	0.059	107	0.25	0.47	0.53	0.515	0.58	0.78
	Titanium	139	100.0%	0	--	--	--	--	--	--	139	309	512	595	606	691	912
	Tungsten	139	35.3%	90	0.2	0.2	0.2	0.2	0.2	0.23	49	0.19	0.26	0.33	0.426	0.445	3.6
	Uranium	139	100.0%	0	--	--	--	--	--	--	139	0.64	1.1	1.3	1.37	1.5	2.8
	Vanadium	139	100.0%	0	--	--	--	--	--	--	139	24.6	34.7	39.5	41.1	45.3	73.3
	Zinc	139	100.0%	0	--	--	--	--	--	--	139	18.1	30.7	33.2	34.1	36.4	68.2
	Zirconium	139	88.5%	16	0.5	0.5	0.5	0.504	0.5	0.56	123	7.7	16.8	21.9	21.6	26.4	33.9
Radionuclides (pCi/g)[a]	Radium-226	107	100.0%	0	--	--	--	--	--	--	107	0.394	1.02	1.37	1.4	1.77	2.29
	Radium-228	106	99.1%	1	--	--	--	--	--	--	105	0.452	1.19	1.39	1.4	1.57	2.31
	Thorium-228	135	100.0%	0	--	--	--	--	--	--	135	0.944	1.45	1.62	1.64	1.83	2.3
	Thorium-230	135	100.0%	0	--	--	--	--	--	--	135	0.552	1.06	1.39	1.42	1.72	2.72
	Thorium-232	135	100.0%	0	--	--	--	--	--	--	135	0.898	1.34	1.49	1.49	1.65	2.01
	Uranium-233/234	121	94.2%	7	--	--	--	--	--	--	114	0.641	1.12	1.41	1.44	1.69	2.63
	Uranium-235/236	121	80.2%	24	--	--	--	--	--	--	97	-0.000681	0.0371	0.0496	0.0538	0.0751	0.116
	Uranium-238	121	93.4%	8	--	--	--	--	--	--	113	0.57	1.06	1.3	1.37	1.57	2.79

Notes:

[a]Because both non-detect and detected radionuclides have reported activity levels, calculated summary statistics are presented as detected regardless of the lab detect flag. Lab detect flags are represented by the censored (non-detect) and detect count fields in the table.

mg/kg milligrams per kilogram
Max maximum concentration
Min minimum concentration
pCi/g picocuries per gram
Q1 1st quartile (25th percentile)
Q3 3rd quartile (75th percentile)

TABLE 5
DESCRIPTIVE SUMMARY STATISTICS FOR BACKGROUND METALS AND RADIONUCLIDES – UMCf (ALL DEPTHS)
BRC BACKGROUND SOIL COMPILATION REPORT
CLARK COUNTY, NEVADA
(Page 1 of 1)

Analyte Group	Analyte	Sample Size	Detection Frequency	Censored (Non-Detect) Data							Detected Data						
				ND Count	Min	Q1	Median	Mean	Q3	Max	Detect Count	Min	Q1	Median	Mean	Q3	Max
Metals (mg/kg)	Aluminum	24	100.0%	0	--	--	--	--	--	--	24	3190	7100	9340	9850	13400	19700
	Antimony	24	95.8%	1	0.1046	--	0.105	0.105	--	0.1046	23	0.066	0.14	0.16	0.175	0.19	0.34
	Arsenic	24	100.0%	0	--	--	--	--	--	--	24	2.1	4.9	7.7	8.8	11.5	24.8
	Barium	24	100.0%	0	--	--	--	--	--	--	24	64.5	141	203	264	386	620
	Beryllium	24	100.0%	0	--	--	--	--	--	--	24	0.17	0.355	0.59	0.557	0.693	1.1
	Boron	24	29.2%	17	2.824	2.82	2.82	2.87	2.82	3.53	7	4.4	6	21.5	16.1	22.5	22.9
	Cadmium	24	75.0%	6	0.01	0.01	0.01	0.01	0.01	0.01	18	0.06	0.0833	0.11	0.109	0.123	0.2
	Calcium	24	100.0%	0	--	--	--	--	--	--	24	4190	14600	22200	22600	31900	38600
	Chromium (Total)	24	100.0%	0	--	--	--	--	--	--	24	2.9	5.7	13.2	13.2	17.7	27.9
	Chromium (VI)	23	8.7%	21	0.16	0.16	0.18	0.18	0.19	0.21	2	0.18	--	0.185	0.185	--	0.19
	Cobalt	24	100.0%	0	--	--	--	--	--	--	24	1.6	2.6	6.45	5.8	8.33	9.7
	Copper	24	100.0%	0	--	--	--	--	--	--	24	4.1	5.85	13.8	12.2	16	21.3
	Iron	24	100.0%	0	--	--	--	--	--	--	24	3620	6940	12800	12600	17400	20100
	Lead	24	100.0%	0	--	--	--	--	--	--	24	4.4	8.63	11.3	10.8	13.1	16.1
	Lithium	24	100.0%	0	--	--	--	--	--	--	24	18.3	23.3	32.3	52.6	47.1	189
	Magnesium	24	100.0%	0	--	--	--	--	--	--	24	2780	7150	10300	11300	13600	31000
	Manganese	24	100.0%	0	--	--	--	--	--	--	24	126	167	295	307	378	786
	Mercury	20	25.0%	15	0.00668	0.00668	0.00668	0.00668	0.00668	0.00668	5	0.008	0.00825	0.0101	0.01	0.0117	0.012
	Molybdenum	24	95.8%	1	0.1046	--	0.105	0.105	--	0.1046	23	0.12	0.32	0.51	0.523	0.65	1.1
	Nickel	24	100.0%	0	--	--	--	--	--	--	24	4.5	7.05	14.4	13.7	16.2	30.9
	Niobium	24	4.2%	23	1.5118	1.51	1.51	1.53	1.51	1.88975	1	4	--	4	4	--	4
	Palladium	24	100.0%	0	--	--	--	--	--	--	24	0.16	0.303	0.615	0.55	0.74	1
	Phosphorus	24	100.0%	0	--	--	--	--	--	--	24	299	562	843	794	1030	1370
	Platinum	24	8.3%	22	0.02	0.02	0.02	0.0202	0.02	0.025	2	0.027	--	0.03	0.03	--	0.033
	Potassium	24	100.0%	0	--	--	--	--	--	--	24	1030	2170	2820	3070	3580	6190
	Selenium	24	0.0%	24	0.32	0.32	0.32	0.323	0.32	0.4	0	--	--	--	--	--	--
	Silicon	24	100.0%	0	--	--	--	--	--	--	24	188	222	304	373	452	1000
	Silver	24	100.0%	0	--	--	--	--	--	--	24	0.051	0.0805	0.14	0.21	0.275	0.82
	Sodium	24	100.0%	0	--	--	--	--	--	--	24	259	367	460	610	883	1200
	Strontium	24	100.0%	0	--	--	--	--	--	--	24	68.5	172	224	207	250	324
	Thallium	24	0.0%	24	0.2	0.2	0.2	0.202	0.2	0.25	0	--	--	--	--	--	--
	Tin	24	83.3%	4	0.0526	0.0526	0.0526	0.0526	0.0526	0.0526	20	0.24	0.345	0.6	0.557	0.728	0.96
	Titanium	24	100.0%	0	--	--	--	--	--	--	24	175	262	565	503	612	1000
	Tungsten	24	20.8%	19	0.2	0.2	0.2	0.203	0.2	0.25	5	0.26	0.265	0.33	0.38	0.52	0.58
	Uranium	24	100.0%	0	--	--	--	--	--	--	24	0.31	0.793	1.15	1.27	1.58	4.4
	Vanadium	24	100.0%	0	--	--	--	--	--	--	24	10	13.6	33.4	30.6	41.9	45.8
	Zinc	24	100.0%	0	--	--	--	--	--	--	24	16.1	22	33.7	33.7	40.2	61.3
	Zirconium	24	100.0%	0	--	--	--	--	--	--	24	6.2	14.8	18	19.7	25.1	36.7
Radionuclides (pCi/g)[a]	Radium-226	18	77.8%	4	--	--	--	--	--	--	14	0.754	0.888	1	1.04	1.1	1.63
	Radium-228	18	94.4%	1	--	--	--	--	--	--	17	0.989	1.08	1.26	1.25	1.37	1.55
	Thorium-228	24	100.0%	0	--	--	--	--	--	--	24	1.01	1.18	1.34	1.38	1.51	2.15
	Thorium-230	24	100.0%	0	--	--	--	--	--	--	24	0.495	0.846	0.979	1.02	1.15	2.09
	Thorium-232	24	100.0%	0	--	--	--	--	--	--	24	0.966	1.19	1.3	1.34	1.47	2.05
	Uranium-233/234	20	60.0%	8	--	--	--	--	--	--	12	0.626	1	1.02	1.11	1.22	1.81
	Uranium-235/236	20	70.0%	6	--	--	--	--	--	--	14	0.0112	0.0212	0.039	0.0426	0.0557	0.101
	Uranium-238	20	55.0%	9	--	--	--	--	--	--	11	0.839	1	1	1.1	1.19	1.75

Notes:

[a]Because both non-detect and detected radionuclides have reported activity levels, calculated summary statistics are presented as detected regardless of the lab detect flag. Lab detect flags are represented by the censored (non-detect) and detect count fields in the table.

mg/kg milligrams per kilogram
Max maximum concentration
Min minimum concentration
pCi/g picocuries per gram
Q1 1st quartile (25th percentile)
Q3 3rd quartile (75th percentile)

TABLE 6
DESCRIPTIVE SUMMARY STATISTICS FOR BACKGROUND METALS AND RADIONUCLIDES – Qal McCULLOUGH (ALL DEPTHS)
BRC BACKGROUND SOIL COMPILATION REPORT
CLARK COUNTY, NEVADA

Analyte Group	Analyte	Sample Size	Detection Frequency	Censored (Non-Detect) Data							Detected Data						
				ND Count	Min	Q1	Median	Mean	Q3	Max	Detect Count	Min	Q1	Median	Mean	Q3	Max
Metals (mg/kg)	Aluminum	180	100.0%	0	--	--	--	--	--	--	180	3740	6970	8720	8940	10700	15300
	Antimony	180	64.4%	64	0.0394	0.33	0.33	0.281	0.33	0.3298	116	0.089	0.13	0.16	0.183	0.2	0.5
	Arsenic	180	100.0%	0	--	--	--	--	--	--	180	2.1	3.2	3.9	4.23	4.9	13.1
	Barium	180	100.0%	0	--	--	--	--	--	--	180	73	125	158	171	200	539
	Beryllium	180	100.0%	0	--	--	--	--	--	--	180	0.16	0.49	0.55	0.57	0.64	0.89
	Boron	174	31.0%	120	2.824	2.82	3.2	3.02	3.2	3.2	54	3	5.48	6.1	6.46	7.53	11.6
	Cadmium	180	43.9%	101	0.01	0.129	0.129	0.122	0.129	0.1291	79	0.05	0.076	0.084	0.0892	0.1	0.16
	Calcium	174	100.0%	0	--	--	--	--	--	--	174	9440	18800	24500	27200	31900	82800
	Chromium (Total)	180	100.0%	0	--	--	--	--	--	--	180	2.6	8.1	9.7	9.73	11.5	16.7
	Chromium (VI)	175	10.3%	157	0.16	0.17	0.25	0.223	0.26	0.32	18	0.18	0.2	0.255	0.409	0.393	1.6
	Cobalt	180	100.0%	0	--	--	--	--	--	--	180	3.7	6.93	8	8.28	9.5	16.3
	Copper	180	100.0%	0	--	--	--	--	--	--	180	8.8	14.8	16.7	17	19	25.9
	Iron	180	100.0%	0	--	--	--	--	--	--	180	5410	12300	14200	14100	16100	22500
	Lead	180	100.0%	0	--	--	--	--	--	--	180	3	6.3	7.25	8.02	9	35.1
	Lithium	174	93.1%	12	1.4628	3.66	3.66	3.47	3.66	3.657	162	7.5	11.9	15.4	16.6	18.8	124
	Magnesium	180	100.0%	0	--	--	--	--	--	--	180	4690	8590	9710	9910	11500	17500
	Manganese	180	100.0%	0	--	--	--	--	--	--	180	151	294	370	384	460	863
	Mercury	180	63.3%	66	0.00668	0.00668	0.00668	0.00685	0.0072	0.0072	114	0.0072	0.011	0.0149	0.0193	0.0224	0.11
	Molybdenum	180	90.6%	17	0.1046	0.105	0.105	0.105	0.105	0.1046	163	0.17	0.42	0.51	0.585	0.66	2
	Nickel	180	100.0%	0	--	--	--	--	--	--	180	7.9	13.8	15.5	15.8	17.4	30
	Niobium	174	3.4%	168	1.015	1.02	1.02	1.23	1.51	1.5118	6	1.7	2.68	3.35	3.12	3.58	3.8
	Palladium	174	100.0%	0	--	--	--	--	--	--	174	0.16	0.338	0.49	0.567	0.73	2.2
	Phosphorus	174	100.0%	0	--	--	--	--	--	--	174	649	1240	1430	1430	1590	2010
	Platinum	174	6.9%	162	0.02	0.02	0.0435	0.0331	0.0435	0.0435	12	0.022	0.025	0.0455	0.0483	0.064	0.099
	Potassium	174	100.0%	0	--	--	--	--	--	--	174	625	1240	1470	1640	1900	3890
	Selenium	180	21.7%	141	0.1579	0.158	0.32	0.249	0.32	0.32	39	0.1	0.26	0.3	0.306	0.35	0.6
	Silicon	174	100.0%	0	--	--	--	--	--	--	174	139	478	689	818	903	4150
	Silver	180	47.2%	95	0.2609	0.261	0.261	0.261	0.261	0.2609	85	0.043	0.105	0.14	0.237	0.195	2.2
	Sodium	174	100.0%	0	--	--	--	--	--	--	174	128	434	661	664	826	3250
	Strontium	174	100.0%	0	--	--	--	--	--	--	174	75.5	168	224	252	300	808
	Thallium	180	17.2%	149	0.2	0.2	0.2	0.37	0.543	0.5428	31	0.13	0.32	1.2	1.04	1.5	1.8
	Tin	174	98.3%	3	0.0526	0.0526	0.0526	0.0526	0.0526	0.0526	171	0.24	0.45	0.53	0.521	0.59	0.8
	Titanium	180	100.0%	0	--	--	--	--	--	--	180	262	505	602	608	700	1010
	Tungsten	174	14.4%	149	0.0175	0.0175	0.0175	0.0836	0.2	0.2	25	0.19	0.27	0.31	0.454	0.375	3.6
	Uranium	173	100.0%	0	--	--	--	--	--	--	173	0.62	0.94	1.2	1.27	1.4	2.8
	Vanadium	180	100.0%	0	--	--	--	--	--	--	180	20.2	35.1	40.6	41.7	47.1	73.3
	Zinc	180	100.0%	0	--	--	--	--	--	--	180	15.4	30.3	33.9	35.6	39.9	121
	Zirconium	174	100.0%	0	--	--	--	--	--	--	174	15.9	25.8	103	83.1	132	179
Radionuclides (pCi/g)[a]	Radium-226	160	100.0%	0	--	--	--	--	--	--	160	0.494	1.04	1.28	1.36	1.68	2.36
	Radium-228	145	100.0%	0	--	--	--	--	--	--	145	0.855	1.36	1.68	1.7	2.02	2.92
	Thorium-228	180	100.0%	0	--	--	--	--	--	--	180	1.11	1.54	1.77	1.75	1.95	2.3
	Thorium-230	180	100.0%	0	--	--	--	--	--	--	180	0.73	1.16	1.42	1.46	1.7	3.01
	Thorium-232	180	100.0%	0	--	--	--	--	--	--	180	0.908	1.44	1.59	1.61	1.79	2.23
	Uranium-233/234	177	100.0%	0	--	--	--	--	--	--	177	0.63	1	1.25	1.38	1.69	2.84
	Uranium-235/236	177	63.8%	64	--	--	--	--	--	--	113	0.0009	0.0462	0.061	0.0668	0.0839	0.21
	Uranium-238	177	100.0%	0	--	--	--	--	--	--	177	0.65	1.02	1.23	1.32	1.56	2.79

Notes:

[a]Because both non-detect and detected radionuclides have reported activity levels, calculated summary statistics are presented as detected regardless of the lab detect flag. Lab detect flags are represented by the censored (non-detect) and detect count fields in the table.

mg/kg milligrams per kilogram
Max maximum concentration
Min minimum concentration
pCi/g picocuries per gram
Q1 1st quartile (25th percentile)
Q3 3rd quartile (75th percentile)

TABLE 7
DESCRIPTIVE SUMMARY STATISTICS FOR BACKGROUND METALS AND RADIONUCLIDES – Qal MIXED (ALL DEPTHS)
BRC BACKGROUND SOIL COMPILATION REPORT
CLARK COUNTY, NEVADA

Analyte Group	Analyte	Sample Size	Detection Frequency	Censored (Non-Detect) Data							Detected Data						
				ND Count	Min	Q1	Median	Mean	Q3	Max	Detect Count	Min	Q1	Median	Mean	Q3	Max
Metals (mg/kg)	Aluminum	35	100.0%	0	--	--	--	--	--	--	35	4840	6370	9020	8630	10400	12300
	Antimony	35	82.9%	6	0.0394	0.0394	0.217	0.195	0.33	0.3298	29	0.12	0.145	0.17	0.183	0.2	0.44
	Arsenic	35	100.0%	0	--	--	--	--	--	--	35	2.9	5.3	6.3	6.4	7.5	10
	Barium	35	100.0%	0	--	--	--	--	--	--	35	211	395	464	490	573	836
	Beryllium	35	100.0%	0	--	--	--	--	--	--	35	0.38	0.49	0.55	0.541	0.59	0.73
	Boron	33	9.1%	30	2.824	2.82	2.82	2.94	3.2	3.2	3	4	4	4.5	4.5	5	5
	Cadmium	35	68.6%	11	0.01	0.129	0.129	0.107	0.129	0.1291	24	0.051	0.0813	0.1	0.0973	0.11	0.14
	Calcium	33	100.0%	0	--	--	--	--	--	--	33	0.43	14900	21500	21600	29600	40500
	Chromium (Total)	35	100.0%	0	--	--	--	--	--	--	35	1.1	9.8	13.1	12.5	15.8	18.3
	Chromium (VI)	23	8.7%	21	0.17	0.17	0.18	0.21	0.26	0.26	2	0.18	--	0.26	0.26	--	0.34
	Cobalt	35	100.0%	0	--	--	--	--	--	--	35	4.7	6.1	7.2	7.31	8	12.9
	Copper	35	100.0%	0	--	--	--	--	--	--	35	9.9	13.5	15.8	16.2	18	30.5
	Iron	35	100.0%	0	--	--	--	--	--	--	35	9180	12200	14300	14000	15900	17200
	Lead	35	100.0%	0	--	--	--	--	--	--	35	7.4	9.5	11.3	12.1	12.9	21.3
	Lithium	33	100.0%	0	--	--	--	--	--	--	33	9.1	13.4	19.6	18.8	22.3	33.4
	Magnesium	35	100.0%	0	--	--	--	--	--	--	35	4580	6650	8880	8340	9900	12800
	Manganese	35	100.0%	0	--	--	--	--	--	--	35	158	293	356	412	488	1090
	Mercury	35	45.7%	19	0.00668	0.00668	0.00668	0.00682	0.0072	0.0072	16	0.0076	0.00863	0.0121	0.0131	0.0167	0.0254
	Molybdenum	35	100.0%	0	--	--	--	--	--	--	35	0.22	0.45	0.62	0.69	0.89	1.8
	Nickel	35	100.0%	0	--	--	--	--	--	--	35	8.9	11.5	13.8	13.5	15.3	17.3
	Niobium	33	9.1%	30	1.015	1.02	1.51	1.36	1.51	1.5118	3	2.8	2.8	2.9	3.1	3.6	3.6
	Palladium	33	100.0%	0	--	--	--	--	--	--	33	0.14	0.405	0.54	0.576	0.8	1.1
	Phosphorus	33	100.0%	0	--	--	--	--	--	--	33	594	815	892	894	984	1200
	Platinum	33	0.0%	33	0.02	0.02	0.02	0.0264	0.0435	0.0435	0	--	--	--	--	--	--
	Potassium	33	100.0%	0	--	--	--	--	--	--	33	1220	1420	1840	1880	2280	3440
	Selenium	35	22.9%	27	0.0467	0.32	0.32	0.298	0.32	0.32	8	0.17	0.238	0.335	0.34	0.4	0.59
	Silicon	33	100.0%	0	--	--	--	--	--	--	33	109	182	204	348	545	883
	Silver	35	74.3%	9	0.2609	0.261	0.261	0.261	0.261	0.2609	26	0.048	0.0918	0.105	0.129	0.15	0.35
	Sodium	33	100.0%	0	--	--	--	--	--	--	33	111	247	313	341	400	901
	Strontium	33	100.0%	0	--	--	--	--	--	--	33	69	163	206	200	261	362
	Thallium	35	20.0%	28	0.2	0.2	0.2	0.249	0.2	0.5428	7	0.12	0.16	1.1	0.883	1.3	1.4
	Tin	33	69.7%	10	0.0526	0.0526	0.0526	0.066	0.0526	0.187	23	0.2	0.28	0.45	0.416	0.51	0.6
	Titanium	35	100.0%	0	--	--	--	--	--	--	35	200	313	468	425	516	638
	Tungsten	33	45.5%	18	0.0175	0.0175	0.109	0.109	0.2	0.2	15	0.24	0.26	0.33	0.395	0.55	0.76
	Uranium	33	100.0%	0	--	--	--	--	--	--	33	0.43	0.795	1	0.984	1.1	1.6
	Vanadium	35	100.0%	0	--	--	--	--	--	--	35	19.2	24.4	37.2	34.1	41.1	44.9
	Zinc	35	100.0%	0	--	--	--	--	--	--	35	21.4	26.8	32.6	32.6	36	52.4
	Zirconium	33	72.7%	9	0.5	0.5	0.5	0.5	0.5	0.5	24	7.7	14.7	16.8	37.2	67.8	92.9
Radionuclides (pCi/g)[a]	Radium-226	23	100.0%	0	--	--	--	--	--	--	23	0.394	0.756	0.915	0.904	1.02	1.32
	Radium-228	17	94.1%	1	--	--	--	--	--	--	16	0.452	1.21	1.41	1.52	1.78	2.94
	Thorium-228	34	100.0%	0	--	--	--	--	--	--	34	1.07	1.38	1.54	1.53	1.69	1.91
	Thorium-230	34	100.0%	0	--	--	--	--	--	--	34	0.602	0.857	1.02	1.02	1.15	1.49
	Thorium-232	34	100.0%	0	--	--	--	--	--	--	34	1.05	1.3	1.47	1.48	1.6	1.93
	Uranium-233/234	22	81.8%	4	--	--	--	--	--	--	18	0.47	0.758	0.939	0.91	1.02	1.32
	Uranium-235/236	22	68.2%	7	--	--	--	--	--	--	15	0.021	0.0307	0.0467	0.0501	0.0606	0.13
	Uranium-238	22	81.8%	4	--	--	--	--	--	--	18	0.57	0.655	0.92	0.877	1.03	1.16

Notes:

[a]Because both non-detect and detected radionuclides have reported activity levels, calculated summary statistics are presented as detected regardless of the lab detect flag. Lab detect flags are represented by the censored (non-detect) and detect count fields in the table.

mg/kg milligrams per kilogram
Max maximum concentration
Min minimum concentration
pCi/g picocuries per gram
Q1 1st quartile (25th percentile)
Q3 3rd quartile (75th percentile)

TABLE 8
DESCRIPTIVE SUMMARY STATISTICS FOR BACKGROUND METALS AND RADIONUCLIDES – Qal RIVER (ALL DEPTHS)
BRC BACKGROUND SOIL COMPILATION REPORT
CLARK COUNTY, NEVADA

Analyte Group	Analyte	Sample Size	Detection Frequency	Censored (Non-Detect) Data							Detected Data						
				ND Count	Min	Q1	Median	Mean	Q3	Max	Detect Count	Min	Q1	Median	Mean	Q3	Max
Metals (mg/kg)	Aluminum	69	100.0%	0	--	--	--	--	--	--	69	5330	7840	8620	9150	10300	15500
	Antimony	69	71.0%	20	0.126	0.126	0.126	0.126	0.126	0.126	49	0.14	0.2	0.22	0.247	0.29	0.61
	Arsenic	69	100.0%	0	--	--	--	--	--	--	69	4.5	6	7.3	8.05	9.1	27.6
	Barium	69	100.0%	0	--	--	--	--	--	--	69	188	283	393	431	534	1350
	Beryllium	69	100.0%	0	--	--	--	--	--	--	69	0.28	0.38	0.45	0.456	0.51	0.78
	Boron	69	33.3%	46	2.824	2.82	2.82	4.3	6.6	6.6	23	5	7.1	7.7	11.5	11.6	57
	Cadmium	69	68.1%	22	0.01	0.01	0.04	0.0264	0.04	0.04	47	0.034	0.077	0.099	0.107	0.13	0.26
	Calcium	69	100.0%	0	--	--	--	--	--	--	69	3430	17700	23000	24700	30100	71300
	Chromium (Total)	69	100.0%	0	--	--	--	--	--	--	69	3.2	8.5	10.4	11	12.6	24.2
	Chromium (VI)	74	21.6%	58	0.16	0.17	0.41	0.323	0.43	0.56	16	0.16	0.22	0.375	0.409	0.538	1.1
	Cobalt	69	100.0%	0	--	--	--	--	--	--	69	3.5	4.2	4.7	4.82	5.15	8.9
	Copper	69	100.0%	0	--	--	--	--	--	--	69	8	9.35	10.4	11.5	12.3	36.2
	Iron	69	100.0%	0	--	--	--	--	--	--	69	6210	8310	10300	10400	11800	21700
	Lead	69	100.0%	0	--	--	--	--	--	--	69	7.6	10.5	11.9	14.6	14.7	53
	Lithium	69	60.9%	27	3.657	3.66	7.31	9.89	14.6	36.57	42	20	26.2	31	31.2	35.5	47.2
	Magnesium	69	100.0%	0	--	--	--	--	--	--	69	1550	6500	7480	7900	8890	15000
	Manganese	69	100.0%	0	--	--	--	--	--	--	69	87.5	160	253	307	333	2070
	Mercury	61	8.2%	56	0.00668	0.00668	0.00668	0.00668	0.00668	0.00668	5	0.007	0.00725	0.0077	0.00832	0.0097	0.0102
	Molybdenum	69	92.8%	5	0.1046	0.105	0.105	0.105	0.105	0.1046	64	0.26	0.39	0.52	0.616	0.698	2.3
	Nickel	69	100.0%	0	--	--	--	--	--	--	69	9.1	11.1	12.6	13	14.3	22
	Niobium	69	5.8%	65	1.5118	1.51	1.51	2.24	3	3	4	2.5	2.53	2.8	3.18	4.2	4.6
	Palladium	69	100.0%	0	--	--	--	--	--	--	69	0.24	0.48	0.65	0.678	0.825	1.6
	Phosphorus	69	100.0%	0	--	--	--	--	--	--	69	296	707	807	818	917	1710
	Platinum	69	0.0%	69	0.02	0.02	0.02	0.0334	0.048	0.048	0	--	--	--	--	--	--
	Potassium	69	100.0%	0	--	--	--	--	--	--	69	1090	2620	3280	3960	4670	12600
	Selenium	69	0.0%	69	0.32	0.32	0.32	0.321	0.32	0.36	0	--	--	--	--	--	--
	Silicon	69	100.0%	0	--	--	--	--	--	--	69	224	526	797	1020	1200	7480
	Silver	69	72.5%	19	0.11	0.11	0.11	0.11	0.11	0.11	50	0.046	0.0698	0.098	0.166	0.203	1.4
	Sodium	69	100.0%	0	--	--	--	--	--	--	69	274	882	1290	1480	1910	4210
	Strontium	69	100.0%	0	--	--	--	--	--	--	69	146	241	308	329	386	761
	Thallium	69	8.7%	63	0.2	0.2	0.2	0.243	0.3	0.3	6	0.43	0.438	0.46	0.717	0.883	2
	Tin	69	46.4%	37	0.0526	0.0526	0.0526	0.166	0.3	0.3	32	0.25	0.333	0.385	0.425	0.468	1
	Titanium	69	100.0%	0	--	--	--	--	--	--	69	215	360	482	464	549	712
	Tungsten	69	15.9%	58	0.2	0.2	0.5	0.361	0.5	0.5	11	0.26	0.27	0.42	0.504	0.6	1
	Uranium	69	100.0%	0	--	--	--	--	--	--	69	0.56	0.775	1.1	1.16	1.3	4.3
	Vanadium	69	100.0%	0	--	--	--	--	--	--	69	19	27.1	31.1	31.1	34.3	55.3
	Zinc	69	100.0%	0	--	--	--	--	--	--	69	25	31.5	37.2	38.4	42.3	70.5
	Zirconium	69	60.9%	27	0.5	0.56	0.8	0.724	0.8	0.8	42	9.1	12.2	14.4	14.5	17	20.5
Radionuclides (pCi/g)[a]	Radium-226	61	96.7%	2	--	--	--	--	--	--	59	0.153	0.797	0.99	1.04	1.23	2.75
	Radium-228	61	91.8%	5	--	--	--	--	--	--	56	0.573	1.1	1.38	1.43	1.59	2.86
	Thorium-228	66	100.0%	0	--	--	--	--	--	--	66	0.944	1.31	1.47	1.58	1.67	3.37
	Thorium-230	66	90.9%	6	--	--	--	--	--	--	60	0.552	1	1.09	1.26	1.49	3.64
	Thorium-232	66	100.0%	0	--	--	--	--	--	--	66	0.898	1.22	1.4	1.43	1.6	2.8
	Uranium-233/234	67	95.5%	3	--	--	--	--	--	--	64	0.641	0.87	1.1	1.28	1.46	4.78
	Uranium-235/236	67	44.8%	37	--	--	--	--	--	--	30	-0.000681	0.032	0.0538	0.0689	0.0915	0.241
	Uranium-238	67	94.0%	4	--	--	--	--	--	--	63	0.545	0.843	1	1.13	1.25	4.01

Notes:

[a]Because both non-detect and detected radionuclides have reported activity levels, calculated summary statistics are presented as detected regardless of the lab detect flag. Lab detect flags are represented by the censored (non-detect) and detect count fields in the table.

mg/kg milligrams per kilogram
Max maximum concentration
Min minimum concentration
pCi/g picocuries per gram
Q1 1st quartile (25th percentile)
Q3 3rd quartile (75th percentile)

TABLE 9
DESCRIPTIVE SUMMARY STATISTICS FOR BACKGROUND METALS AND RADIONUCLIDES – Qal McCULLOUGH (0 TO 10 FT BGS)
BRC BACKGROUND SOIL COMPILATION REPORT
CLARK COUNTY, NEVADA

Analyte Group	Analyte	Sample Size	Detection Frequency	Censored (Non-Detect) Data							Detected Data						
				ND Count	Min	Q1	Median	Mean	Q3	Max	Detect Count	Min	Q1	Median	Mean	Q3	Max
Metals (mg/kg)	Aluminum	101	100.0%	0	--	--	--	--	--	--	101	3740	6810	8470	9130	11500	15300
	Antimony	101	42.6%	58	0.0394	0.33	0.33	0.3	0.33	0.3298	43	0.12	0.15	0.22	0.241	0.29	0.5
	Arsenic	101	100.0%	0	--	--	--	--	--	--	101	2.1	3.35	3.9	4.11	4.9	7.2
	Barium	101	100.0%	0	--	--	--	--	--	--	101	73	141	175	182	217	465
	Beryllium	101	100.0%	0	--	--	--	--	--	--	101	0.16	0.45	0.54	0.581	0.725	0.89
	Boron	95	35.8%	61	3.2	3.2	3.2	3.2	3.2	3.2	34	5.2	5.8	6.8	7.11	8.3	11.6
	Cadmium	101	5.9%	95	0.1291	0.129	0.129	0.129	0.129	0.1291	6	0.095	0.0965	0.105	0.115	0.138	0.16
	Calcium	95	100.0%	0	--	--	--	--	--	--	95	9440	18400	24500	29000	37300	82800
	Chromium (Total)	101	100.0%	0	--	--	--	--	--	--	101	2.6	6.85	9	9.03	11.2	16.7
	Chromium (VI)	95	0.0%	95	0.25	0.25	0.26	0.258	0.26	0.32	0	--	--	--	--	--	--
	Cobalt	101	100.0%	0	--	--	--	--	--	--	101	3.7	7.05	8.8	8.67	9.95	16.3
	Copper	101	100.0%	0	--	--	--	--	--	--	101	10.1	14.7	17.6	17.5	19.9	25.9
	Iron	101	100.0%	0	--	--	--	--	--	--	101	5410	10700	13500	13200	15600	19700
	Lead	101	100.0%	0	--	--	--	--	--	--	101	3	6.1	7.3	8.47	9.5	35.1
	Lithium	95	100.0%	0	--	--	--	--	--	--	95	7.5	10.8	12.9	14	17.1	26.5
	Magnesium	101	100.0%	0	--	--	--	--	--	--	101	4690	8410	10200	10200	12400	17500
	Manganese	101	100.0%	0	--	--	--	--	--	--	101	151	333	409	416	492	863
	Mercury	101	78.2%	22	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072	79	0.0084	0.012	0.018	0.0223	0.027	0.11
	Molybdenum	101	100.0%	0	--	--	--	--	--	--	101	0.17	0.39	0.48	0.533	0.605	2
	Nickel	101	100.0%	0	--	--	--	--	--	--	101	7.9	12.9	16	15.9	18.4	30
	Niobium	95	0.0%	95	1.015	1.02	1.02	1.02	1.02	1.015	0	--	--	--	--	--	--
	Palladium	95	100.0%	0	--	--	--	--	--	--	95	0.16	0.3	0.42	0.48	0.58	1.5
	Phosphorus	95	100.0%	0	--	--	--	--	--	--	95	862	1250	1490	1470	1690	2010
	Platinum	95	5.3%	90	0.0435	0.0435	0.0435	0.0435	0.0435	0.0435	5	0.045	0.0545	0.064	0.0708	0.0905	0.099
	Potassium	95	100.0%	0	--	--	--	--	--	--	95	625	1180	1580	1750	2230	3890
	Selenium	101	38.6%	62	0.1579	0.158	0.158	0.158	0.158	0.1579	39	0.1	0.26	0.3	0.306	0.35	0.6
	Silicon	95	100.0%	0	--	--	--	--	--	--	95	335	551	721	1010	1120	4150
	Silver	101	5.9%	95	0.2609	0.261	0.261	0.261	0.261	0.2609	6	0.043	0.0438	0.051	0.0582	0.0785	0.083
	Sodium	95	100.0%	0	--	--	--	--	--	--	95	128	214	487	498	693	1320
	Strontium	95	100.0%	0	--	--	--	--	--	--	95	75.5	143	192	232	267	808
	Thallium	101	26.7%	74	0.5428	0.543	0.543	0.543	0.543	0.5428	27	0.13	1.1	1.2	1.16	1.5	1.8
	Tin	95	100.0%	0	--	--	--	--	--	--	95	0.24	0.41	0.51	0.499	0.57	0.8
	Titanium	101	100.0%	0	--	--	--	--	--	--	101	262	446	533	552	654	1010
	Tungsten	95	0.0%	95	0.0175	0.0175	0.0175	0.0175	0.0175	0.0175	0	--	--	--	--	--	--
	Uranium	94	100.0%	0	--	--	--	--	--	--	94	0.62	0.84	0.97	1.03	1.1	2.7
	Vanadium	101	100.0%	0	--	--	--	--	--	--	101	20.2	32.6	36.9	38.3	44.9	59.1
	Zinc	101	100.0%	0	--	--	--	--	--	--	101	15.4	31	38.9	38.5	44.1	121
	Zirconium	95	100.0%	0	--	--	--	--	--	--	95	86.1	116	129	131	146	179
Radionuclides (pCi/g)[a]	Radium-226	95	100.0%	0	--	--	--	--	--	--	95	0.494	0.952	1.09	1.15	1.27	2.36
	Radium-228	81	100.0%	0	--	--	--	--	--	--	81	0.946	1.64	1.93	1.89	2.16	2.92
	Thorium-228	101	100.0%	0	--	--	--	--	--	--	101	1.15	1.51	1.78	1.74	1.93	2.28
	Thorium-230	101	100.0%	0	--	--	--	--	--	--	101	0.73	1.05	1.21	1.29	1.48	3.01
	Thorium-232	101	100.0%	0	--	--	--	--	--	--	101	1.22	1.44	1.66	1.66	1.85	2.23
	Uranium-233/234	101	100.0%	0	--	--	--	--	--	--	101	0.63	0.9	1.05	1.19	1.24	2.84
	Uranium-235/236	101	44.6%	56	--	--	--	--	--	--	45	0.0009	0.044	0.06	0.0696	0.0925	0.21
	Uranium-238	101	100.0%	0	--	--	--	--	--	--	101	0.65	0.92	1.05	1.16	1.32	2.37

Notes:

[a]Because both non-detect and detected radionuclides have reported activity levels, calculated summary statistics are presented as detected regardless of the lab detect flag. Lab detect flags are represented by the censored (non-detect) and detect count fields in the table.

mg/kg milligrams per kilogram
Max maximum concentration
Min minimum concentration
pCi/g picocuries per gram
Q1 1st quartile (25th percentile)
Q3 3rd quartile (75th percentile)

TABLE 10
DESCRIPTIVE SUMMARY STATISTICS FOR BACKGROUND METALS AND RADIONUCLIDES – Qal MIXED (0 TO 10 FT BGS)
BRC BACKGROUND SOIL COMPILATION REPORT
CLARK COUNTY, NEVADA

Analyte Group	Analyte	Sample Size	Detection Frequency	Censored (Non-Detect) Data							Detected Data						
				ND Count	Min	Q1	Median	Mean	Q3	Max	Detect Count	Min	Q1	Median	Mean	Q3	Max
Metals (mg/kg)	Aluminum	11	100.0%	0	--	--	--	--	--	--	11	4840	5480	6180	6700	6370	10900
	Antimony	11	54.5%	5	0.0394	0.0394	0.33	0.214	0.33	0.3298	6	0.13	0.13	0.21	0.228	0.298	0.44
	Arsenic	11	100.0%	0	--	--	--	--	--	--	11	2.9	4.4	5.3	4.87	5.7	5.9
	Barium	11	100.0%	0	--	--	--	--	--	--	11	211	346	424	468	604	836
	Beryllium	11	100.0%	0	--	--	--	--	--	--	11	0.38	0.43	0.52	0.504	0.56	0.62
	Boron	9	0.0%	9	3.2	3.2	3.2	3.2	3.2	3.2	0	--	--	--	--	--	--
	Cadmium	11	18.2%	9	0.1291	0.129	0.129	0.129	0.129	0.1291	2	0.11	--	0.125	0.125	--	0.14
	Calcium	9	100.0%	0	--	--	--	--	--	--	9	8160	10200	16100	18600	28500	36400
	Chromium (Total)	11	100.0%	0	--	--	--	--	--	--	11	5	7.8	8.8	8.86	10.2	11.7
	Chromium (VI)	9	0.0%	9	0.25	0.25	0.26	0.257	0.26	0.26	0	--	--	--	--	--	--
	Cobalt	11	100.0%	0	--	--	--	--	--	--	11	5.1	5.4	6.1	6.91	7.8	12.3
	Copper	11	100.0%	0	--	--	--	--	--	--	11	11.1	14.3	18.3	18.6	23.2	30.5
	Iron	11	100.0%	0	--	--	--	--	--	--	11	9180	10800	11200	11700	13600	14000
	Lead	11	100.0%	0	--	--	--	--	--	--	11	8.9	9.1	9.9	12.6	17.5	21
	Lithium	9	100.0%	0	--	--	--	--	--	--	9	9.1	10.1	11.7	11.8	13.4	14.9
	Magnesium	11	100.0%	0	--	--	--	--	--	--	11	4580	5100	5450	6060	6880	9090
	Manganese	11	100.0%	0	--	--	--	--	--	--	11	345	414	469	507	504	1090
	Mercury	11	54.5%	5	0.0072	0.0072	0.0072	0.0072	0.0072	0.0072	6	0.0097	0.0129	0.016	0.0156	0.019	0.019
	Molybdenum	11	100.0%	0	--	--	--	--	--	--	11	0.22	0.73	0.9	0.859	1.1	1.3
	Nickel	11	100.0%	0	--	--	--	--	--	--	11	8.9	10.3	11.3	11.3	12.1	13.8
	Niobium	9	0.0%	9	1.015	1.02	1.02	1.02	1.02	1.015	0	--	--	--	--	--	--
	Palladium	9	100.0%	0	--	--	--	--	--	--	9	0.14	0.19	0.22	0.266	0.37	0.48
	Phosphorus	9	100.0%	0	--	--	--	--	--	--	9	636	725	804	798	874	984
	Platinum	9	0.0%	9	0.0435	0.0435	0.0435	0.0435	0.0435	0.0435	0	--	--	--	--	--	--
	Potassium	9	100.0%	0	--	--	--	--	--	--	9	1240	1240	1380	1470	1710	1840
	Selenium	11	72.7%	3	0.0467	0.0467	0.158	0.121	0.158	0.1579	8	0.17	0.238	0.335	0.34	0.4	0.59
	Silicon	9	100.0%	0	--	--	--	--	--	--	9	527	622	690	708	794	883
	Silver	11	18.2%	9	0.2609	0.261	0.261	0.261	0.261	0.2609	2	0.048	--	0.052	0.052	--	0.056
	Sodium	9	100.0%	0	--	--	--	--	--	--	9	111	135	265	352	572	901
	Strontium	9	100.0%	0	--	--	--	--	--	--	9	69	85.6	92	122	180	219
	Thallium	11	63.6%	4	0.5428	0.543	0.543	0.543	0.543	0.5428	7	0.12	0.16	1.1	0.883	1.3	1.4
	Tin	9	88.9%	1	0.187	--	0.187	0.187	--	0.187	8	0.2	0.21	0.235	0.255	0.318	0.34
	Titanium	11	100.0%	0	--	--	--	--	--	--	11	200	219	244	272	313	398
	Tungsten	9	0.0%	9	0.0175	0.0175	0.0175	0.0175	0.0175	0.0175	0	--	--	--	--	--	--
	Uranium	9	100.0%	0	--	--	--	--	--	--	9	0.43	0.57	0.71	0.678	0.79	0.84
	Vanadium	11	100.0%	0	--	--	--	--	--	--	11	19.2	21.7	23.2	23	24.4	26
	Zinc	11	100.0%	0	--	--	--	--	--	--	11	21.4	23.9	25.2	30.7	35.3	52.4
	Zirconium	9	100.0%	0	--	--	--	--	--	--	9	60.1	64.8	69	75.2	89.2	92.9
Radionuclides (pCi/g)[a]	Radium-226	9	100.0%	0	--	--	--	--	--	--	9	0.583	0.611	0.756	0.735	0.854	0.926
	Radium-228	3	100.0%	0	--	--	--	--	--	--	3	2.14	2.14	2.42	2.5	2.94	2.94
	Thorium-228	11	100.0%	0	--	--	--	--	--	--	11	1.17	1.28	1.44	1.46	1.62	1.9
	Thorium-230	11	100.0%	0	--	--	--	--	--	--	11	0.66	0.78	0.84	0.905	1.02	1.37
	Thorium-232	11	100.0%	0	--	--	--	--	--	--	11	1.05	1.26	1.44	1.42	1.47	1.93
	Uranium-233/234	11	100.0%	0	--	--	--	--	--	--	11	0.47	0.68	0.76	0.736	0.8	0.9
	Uranium-235/236	11	45.5%	6	--	--	--	--	--	--	5	0.021	0.035	0.053	0.0594	0.076	0.13
	Uranium-238	11	100.0%	0	--	--	--	--	--	--	11	0.57	0.59	0.66	0.719	0.82	0.94

Notes:

[a]Because both non-detect and detected radionuclides have reported activity levels, calculated summary statistics are presented as detected regardless of the lab detect flag. Lab detect flags are represented by the censored (non-detect) and detect count fields in the table.

mg/kg milligrams per kilogram
Max maximum concentration
Min minimum concentration
pCi/g picocuries per gram
Q1 1st quartile (25th percentile)
Q3 3rd quartile (75th percentile)

TABLE 11
DESCRIPTIVE SUMMARY STATISTICS FOR BACKGROUND METALS AND RADIONUCLIDES – Qal RIVER (0 TO 10 FT BGS)
BRC BACKGROUND SOIL COMPILATION REPORT
CLARK COUNTY, NEVADA

Analyte Group	Analyte	Sample Size	Detection Frequency	Censored (Non-Detect) Data							Detected Data						
				ND Count	Min	Q1	Median	Mean	Q3	Max	Detect Count	Min	Q1	Median	Mean	Q3	Max
Metals (mg/kg)	Aluminum	33	100.0%	0	--	--	--	--	--	--	33	5330	7170	9260	9740	12700	15500
	Antimony	33	39.4%	20	0.126	0.126	0.126	0.126	0.126	0.126	13	0.19	0.255	0.3	0.318	0.37	0.61
	Arsenic	33	100.0%	0	--	--	--	--	--	--	33	4.5	6.15	7.7	8.65	9.6	27.6
	Barium	33	100.0%	0	--	--	--	--	--	--	33	211	307	428	466	633	755
	Beryllium	33	100.0%	0	--	--	--	--	--	--	33	0.28	0.35	0.4	0.439	0.49	0.78
	Boron	33	45.5%	18	6.6	6.6	6.6	6.6	6.6	6.6	15	7.1	7.4	9.7	13.2	11.8	57
	Cadmium	33	63.6%	12	0.04	0.04	0.04	0.04	0.04	0.04	21	0.053	0.0805	0.11	0.12	0.15	0.26
	Calcium	33	100.0%	0	--	--	--	--	--	--	33	3430	20600	25400	27800	35500	71300
	Chromium (Total)	33	100.0%	0	--	--	--	--	--	--	33	3.2	7.25	9.9	10.8	13.6	23.6
	Chromium (VI)	33	0.0%	33	0.41	0.41	0.42	0.441	0.47	0.56	0	--	--	--	--	--	--
	Cobalt	33	100.0%	0	--	--	--	--	--	--	33	3.7	4.2	4.7	5.04	5.25	8.9
	Copper	33	100.0%	0	--	--	--	--	--	--	33	8	9.45	10.8	12.8	13.5	36.2
	Iron	33	100.0%	0	--	--	--	--	--	--	33	6210	7770	9310	10300	11800	21700
	Lead	33	100.0%	0	--	--	--	--	--	--	33	7.6	10.2	12.1	15.2	16	53
	Lithium	33	18.2%	27	3.657	3.66	7.31	9.89	14.6	36.57	6	26.3	30	33	33.2	35.9	41.8
	Magnesium	33	100.0%	0	--	--	--	--	--	--	33	1550	6480	7580	8210	9640	15000
	Manganese	33	100.0%	0	--	--	--	--	--	--	33	178	238	295	410	383	2070
	Mercury	33	0.0%	33	0.00668	0.00668	0.00668	0.00668	0.00668	0.00668	0	--	--	--	--	--	--
	Molybdenum	33	100.0%	0	--	--	--	--	--	--	33	0.28	0.5	0.64	0.788	1.05	2.3
	Nickel	33	100.0%	0	--	--	--	--	--	--	33	9.1	10.6	11.8	12.6	14	22
	Niobium	33	3.0%	32	3	3	3	3	3	3	1	4.6	--	4.6	4.6	--	4.6
	Palladium	33	100.0%	0	--	--	--	--	--	--	33	0.35	0.58	0.73	0.788	0.94	1.6
	Phosphorus	33	100.0%	0	--	--	--	--	--	--	33	296	621	754	806	951	1710
	Platinum	33	0.0%	33	0.048	0.048	0.048	0.048	0.048	0.048	0	--	--	--	--	--	--
	Potassium	33	100.0%	0	--	--	--	--	--	--	33	1090	2110	2820	3530	4400	9000
	Selenium	33	0.0%	33	0.32	0.32	0.32	0.32	0.32	0.32	0	--	--	--	--	--	--
	Silicon	33	100.0%	0	--	--	--	--	--	--	33	344	833	1190	1430	1530	7480
	Silver	33	42.4%	19	0.11	0.11	0.11	0.11	0.11	0.11	14	0.054	0.0693	0.076	0.095	0.123	0.17
	Sodium	33	100.0%	0	--	--	--	--	--	--	33	274	854	1370	1580	2030	4210
	Strontium	33	100.0%	0	--	--	--	--	--	--	33	172	294	379	392	471	761
	Thallium	33	18.2%	27	0.3	0.3	0.3	0.3	0.3	0.3	6	0.43	0.438	0.46	0.717	0.883	2
	Tin	33	48.5%	17	0.3	0.3	0.3	0.3	0.3	0.3	16	0.32	0.345	0.43	0.483	0.593	1
	Titanium	33	100.0%	0	--	--	--	--	--	--	33	215	319	380	408	523	611
	Tungsten	33	6.1%	31	0.5	0.5	0.5	0.5	0.5	0.5	2	0.96	--	0.98	0.98	--	1
	Uranium	33	100.0%	0	--	--	--	--	--	--	33	0.56	0.73	0.92	1.17	1.25	4.3
	Vanadium	33	100.0%	0	--	--	--	--	--	--	33	19	24.6	29.4	30.4	33.6	55.3
	Zinc	33	100.0%	0	--	--	--	--	--	--	33	25	30.1	35.2	37	42.3	70.5
	Zirconium	33	39.4%	20	0.8	0.8	0.8	0.8	0.8	0.8	13	9.1	10.4	11.5	11.7	12.5	16.8
Radionuclides (pCi/g)[a]	Radium-226	33	93.9%	2	--	--	--	--	--	--	31	0.153	0.798	0.992	1.1	1.38	2.75
	Radium-228	33	84.8%	5	--	--	--	--	--	--	28	0.573	1.17	1.38	1.54	1.99	2.86
	Thorium-228	33	100.0%	0	--	--	--	--	--	--	33	1.1	1.35	1.64	1.79	2.24	3.37
	Thorium-230	33	81.8%	6	--	--	--	--	--	--	27	1	1.02	1.34	1.49	1.84	3.64
	Thorium-232	33	100.0%	0	--	--	--	--	--	--	33	1.14	1.35	1.49	1.54	1.71	2.8
	Uranium-233/234	33	100.0%	0	--	--	--	--	--	--	33	0.7	0.867	1.17	1.46	1.96	4.78
	Uranium-235/236	33	33.3%	22	--	--	--	--	--	--	11	0.0224	0.06	0.088	0.102	0.12	0.241
	Uranium-238	33	100.0%	0	--	--	--	--	--	--	33	0.545	0.788	0.938	1.2	1.43	4.01

Notes:

[a]Because both non-detect and detected radionuclides have reported activity levels, calculated summary statistics are presented as detected regardless of the lab detect flag. Lab detect flags are represented by the censored (non-detect) and detect count fields in the table.

mg/kg milligrams per kilogram
Max maximum concentration
Min minimum concentration
pCi/g picocuries per gram
Q1 1st quartile (25th percentile)
Q3 3rd quartile (75th percentile)

TABLE 12
DESCRIPTIVE SUMMARY STATISTICS FOR BACKGROUND METALS AND RADIONUCLIDES – Qal McCULLOUGH (>10 FT BGS)
BRC BACKGROUND SOIL COMPILATION REPORT
CLARK COUNTY, NEVADA

Analyte Group	Analyte	Sample Size	Detection Frequency	Censored (Non-Detect) Data							Detected Data						
				ND Count	Min	Q1	Median	Mean	Q3	Max	Detect Count	Min	Q1	Median	Mean	Q3	Max
Metals (mg/kg)	Aluminum	79	100.0%	0	--	--	--	--	--	--	79	5060	7230	8790	8690	9860	15100
	Antimony	79	92.4%	6	0.1046	0.105	0.105	0.105	0.105	0.1046	73	0.089	0.13	0.15	0.148	0.165	0.22
	Arsenic	79	100.0%	0	--	--	--	--	--	--	79	2.2	3.1	3.8	4.38	5	13.1
	Barium	79	100.0%	0	--	--	--	--	--	--	79	84.7	117	138	156	173	539
	Beryllium	79	100.0%	0	--	--	--	--	--	--	79	0.29	0.51	0.55	0.556	0.6	0.67
	Boron	79	25.3%	59	2.824	2.82	2.82	2.82	2.82	2.824	20	3	3.98	5.6	5.36	6.35	7.6
	Cadmium	79	92.4%	6	0.01	0.01	0.01	0.01	0.01	0.01	73	0.05	0.075	0.084	0.0871	0.0975	0.13
	Calcium	79	100.0%	0	--	--	--	--	--	--	79	10700	19300	24500	25000	29600	46600
	Chromium (Total)	79	100.0%	0	--	--	--	--	--	--	79	7.1	9.3	10.3	10.6	11.8	16.6
	Chromium (VI)	80	22.5%	62	0.16	0.17	0.17	0.169	0.17	0.19	18	0.18	0.2	0.255	0.409	0.393	1.6
	Cobalt	79	100.0%	0	--	--	--	--	--	--	79	5.3	6.8	7.5	7.78	8.6	10.8
	Copper	79	100.0%	0	--	--	--	--	--	--	79	8.8	15.3	16.4	16.3	17.3	24
	Iron	79	100.0%	0	--	--	--	--	--	--	79	11200	13100	14700	15400	17000	22500
	Lead	79	100.0%	0	--	--	--	--	--	--	79	4.9	6.4	7.1	7.44	8.4	15.8
	Lithium	79	84.8%	12	1.4628	3.66	3.66	3.47	3.66	3.657	67	7.5	15.4	17.4	20.1	21.3	124
	Magnesium	79	100.0%	0	--	--	--	--	--	--	79	4990	8650	9530	9550	10600	12500
	Manganese	79	100.0%	0	--	--	--	--	--	--	79	217	276	319	343	390	579
	Mercury	79	44.3%	44	0.00668	0.00668	0.00668	0.00668	0.00668	0.00668	35	0.0072	0.0086	0.0129	0.0126	0.0146	0.0235
	Molybdenum	79	78.5%	17	0.1046	0.105	0.105	0.105	0.105	0.1046	62	0.31	0.47	0.575	0.67	0.815	1.9
	Nickel	79	100.0%	0	--	--	--	--	--	--	79	8.5	14.4	15.3	15.5	16.3	27.5
	Niobium	79	7.6%	73	1.5118	1.51	1.51	1.51	1.51	1.5118	6	1.7	2.68	3.35	3.12	3.58	3.8
	Palladium	79	100.0%	0	--	--	--	--	--	--	79	0.2	0.39	0.61	0.672	0.83	2.2
	Phosphorus	79	100.0%	0	--	--	--	--	--	--	79	649	1240	1390	1370	1500	1930
	Platinum	79	8.9%	72	0.02	0.02	0.02	0.02	0.02	0.02	7	0.022	0.023	0.025	0.0323	0.046	0.049
	Potassium	79	100.0%	0	--	--	--	--	--	--	79	850	1240	1430	1500	1720	2450
	Selenium	79	0.0%	79	0.32	0.32	0.32	0.32	0.32	0.32	0	--	--	--	--	--	--
	Silicon	79	100.0%	0	--	--	--	--	--	--	79	139	370	617	591	823	1080
	Silver	79	100.0%	0	--	--	--	--	--	--	79	0.074	0.11	0.15	0.251	0.2	2.2
	Sodium	79	100.0%	0	--	--	--	--	--	--	79	428	644	776	864	1000	3250
	Strontium	79	100.0%	0	--	--	--	--	--	--	79	123	207	250	275	311	793
	Thallium	79	5.1%	75	0.2	0.2	0.2	0.2	0.2	0.2	4	0.15	0.163	0.21	0.228	0.31	0.34
	Tin	79	96.2%	3	0.0526	0.0526	0.0526	0.0526	0.0526	0.0526	76	0.25	0.513	0.55	0.549	0.62	0.78
	Titanium	79	100.0%	0	--	--	--	--	--	--	79	445	597	671	680	751	912
	Tungsten	79	31.6%	54	0.2	0.2	0.2	0.2	0.2	0.2	25	0.19	0.27	0.31	0.454	0.375	3.6
	Uranium	79	100.0%	0	--	--	--	--	--	--	79	0.89	1.2	1.4	1.55	1.8	2.8
	Vanadium	79	100.0%	0	--	--	--	--	--	--	79	26.7	38.3	43.2	46	53.5	73.3
	Zinc	79	100.0%	0	--	--	--	--	--	--	79	18.1	29.9	32	31.9	34	41.2
	Zirconium	79	100.0%	0	--	--	--	--	--	--	79	15.9	22.3	25.5	25.2	27.3	33.9
Radionuclides (pCi/g)[a]	Radium-226	65	100.0%	0	--	--	--	--	--	--	65	0.981	1.4	1.64	1.67	1.97	2.29
	Radium-228	64	100.0%	0	--	--	--	--	--	--	64	0.855	1.23	1.4	1.46	1.68	2.31
	Thorium-228	79	100.0%	0	--	--	--	--	--	--	79	1.11	1.57	1.75	1.76	1.96	2.3
	Thorium-230	79	100.0%	0	--	--	--	--	--	--	79	1.05	1.42	1.58	1.68	1.92	2.72
	Thorium-232	79	100.0%	0	--	--	--	--	--	--	79	0.908	1.44	1.54	1.56	1.69	2.01
	Uranium-233/234	76	100.0%	0	--	--	--	--	--	--	76	0.868	1.4	1.62	1.65	1.79	2.63
	Uranium-235/236	76	89.5%	8	--	--	--	--	--	--	68	0.0121	0.0465	0.065	0.0631	0.077	0.116
	Uranium-238	76	100.0%	0	--	--	--	--	--	--	76	0.993	1.28	1.51	1.55	1.7	2.79

Notes:

[a]Because both non-detect and detected radionuclides have reported activity levels, calculated summary statistics are presented as detected regardless of the lab detect flag. Lab detect flags are represented by the censored (non-detect) and detect count fields in the table.

mg/kg milligrams per kilogram
Max maximum concentration
Min minimum concentration
pCi/g picocuries per gram
Q1 1st quartile (25th percentile)
Q3 3rd quartile (75th percentile)

TABLE 13
DESCRIPTIVE SUMMARY STATISTICS FOR BACKGROUND METALS AND RADIONUCLIDES – Qal MIXED (>10 FT BGS)
BRC BACKGROUND SOIL COMPILATION REPORT
CLARK COUNTY, NEVADA

Analyte Group	Analyte	Sample Size	Detection Frequency	Censored (Non-Detect) Data							Detected Data						
				ND Count	Min	Q1	Median	Mean	Q3	Max	Detect Count	Min	Q1	Median	Mean	Q3	Max
Metals (mg/kg)	Aluminum	24	100.0%	0	--	--	--	--	--	--	24	7060	8380	9380	9510	10500	12300
	Antimony	24	95.8%	1	0.1046	--	0.105	0.105	--	0.1046	23	0.12	0.15	0.16	0.172	0.2	0.26
	Arsenic	24	100.0%	0	--	--	--	--	--	--	24	4.4	6.23	6.95	7.1	8.25	10
	Barium	24	100.0%	0	--	--	--	--	--	--	24	262	410	488	500	555	743
	Beryllium	24	100.0%	0	--	--	--	--	--	--	24	0.44	0.493	0.56	0.558	0.605	0.73
	Boron	24	12.5%	21	2.824	2.82	2.82	2.82	2.82	2.824	3	4	4	4.5	4.5	5	5
	Cadmium	24	91.7%	2	0.01	--	0.01	0.01	--	0.01	22	0.051	0.081	0.0995	0.0948	0.11	0.13
	Calcium	24	100.0%	0	--	--	--	--	--	--	24	0.43	16300	23100	22800	30000	40500
	Chromium (Total)	24	100.0%	0	--	--	--	--	--	--	24	1.1	13	15	14.2	16.2	18.3
	Chromium (VI)	14	14.3%	12	0.17	0.17	0.17	0.175	0.18	0.19	2	0.18	--	0.26	0.26	--	0.34
	Cobalt	24	100.0%	0	--	--	--	--	--	--	24	4.7	6.75	7.5	7.49	8	12.9
	Copper	24	100.0%	0	--	--	--	--	--	--	24	9.9	13.4	15.2	15	16.5	18.8
	Iron	24	100.0%	0	--	--	--	--	--	--	24	11900	14300	15400	15100	16400	17200
	Lead	24	100.0%	0	--	--	--	--	--	--	24	7.4	10.4	11.4	11.8	12.8	21.3
	Lithium	24	100.0%	0	--	--	--	--	--	--	24	13	18.5	20.9	21.4	23.1	33.4
	Magnesium	24	100.0%	0	--	--	--	--	--	--	24	5920	8620	9440	9390	10200	12800
	Manganese	24	100.0%	0	--	--	--	--	--	--	24	158	241	328	368	397	836
	Mercury	24	41.7%	14	0.00668	0.00668	0.00668	0.00668	0.00668	0.00668	10	0.0076	0.00828	0.0094	0.0117	0.0144	0.0254
	Molybdenum	24	100.0%	0	--	--	--	--	--	--	24	0.28	0.45	0.56	0.613	0.685	1.8
	Nickel	24	100.0%	0	--	--	--	--	--	--	24	9.7	13	15.1	14.5	15.7	17.3
	Niobium	24	12.5%	21	1.5118	1.51	1.51	1.51	1.51	1.5118	3	2.8	2.8	2.9	3.1	3.6	3.6
	Palladium	24	100.0%	0	--	--	--	--	--	--	24	0.41	0.52	0.705	0.693	0.853	1.1
	Phosphorus	24	100.0%	0	--	--	--	--	--	--	24	594	881	920	930	1010	1200
	Platinum	24	0.0%	24	0.02	0.02	0.02	0.02	0.02	0.02	0	--	--	--	--	--	--
	Potassium	24	100.0%	0	--	--	--	--	--	--	24	1220	1610	1960	2040	2400	3440
	Selenium	24	0.0%	24	0.32	0.32	0.32	0.32	0.32	0.32	0	--	--	--	--	--	--
	Silicon	24	100.0%	0	--	--	--	--	--	--	24	109	166	193	212	237	516
	Silver	24	100.0%	0	--	--	--	--	--	--	24	0.077	0.0925	0.11	0.135	0.15	0.35
	Sodium	24	100.0%	0	--	--	--	--	--	--	24	235	279	319	337	390	537
	Strontium	24	100.0%	0	--	--	--	--	--	--	24	153	175	219	230	271	362
	Thallium	24	0.0%	24	0.2	0.2	0.2	0.2	0.2	0.2	0	--	--	--	--	--	--
	Tin	24	62.5%	9	0.0526	0.0526	0.0526	0.0526	0.0526	0.0526	15	0.43	0.45	0.49	0.502	0.53	0.6
	Titanium	24	100.0%	0	--	--	--	--	--	--	24	323	462	500	495	547	638
	Tungsten	24	62.5%	9	0.2	0.2	0.2	0.2	0.2	0.2	15	0.24	0.26	0.33	0.395	0.55	0.76
	Uranium	24	100.0%	0	--	--	--	--	--	--	24	0.75	0.973	1.1	1.1	1.18	1.6
	Vanadium	24	100.0%	0	--	--	--	--	--	--	24	29.4	36.3	39.5	39.2	42.4	44.9
	Zinc	24	100.0%	0	--	--	--	--	--	--	24	26.8	30.7	33.3	33.4	36.1	46.4
	Zirconium	24	62.5%	9	0.5	0.5	0.5	0.5	0.5	0.5	15	7.7	12.1	15.2	14.3	16.7	17.7
Radionuclides (pCi/g)[a]	Radium-226	14	100.0%	0	--	--	--	--	--	--	14	0.394	0.908	0.98	1.01	1.25	1.32
	Radium-228	14	92.9%	1	--	--	--	--	--	--	13	0.452	1.17	1.33	1.31	1.49	1.79
	Thorium-228	23	100.0%	0	--	--	--	--	--	--	23	1.07	1.39	1.59	1.57	1.7	1.91
	Thorium-230	23	100.0%	0	--	--	--	--	--	--	23	0.602	0.923	1.09	1.07	1.17	1.49
	Thorium-232	23	100.0%	0	--	--	--	--	--	--	23	1.12	1.31	1.51	1.51	1.66	1.89
	Uranium-233/234	11	63.6%	4	--	--	--	--	--	--	7	0.977	1	1.01	1.08	1.18	1.32
	Uranium-235/236	11	90.9%	1	--	--	--	--	--	--	10	0.0235	0.0303	0.0394	0.0407	0.0479	0.0624
	Uranium-238	11	63.6%	4	--	--	--	--	--	--	7	0.897	1	1.02	1.03	1.08	1.16

Notes:

[a]Because both non-detect and detected radionuclides have reported activity levels, calculated summary statistics are presented as detected regardless of the lab detect flag. Lab detect flags are represented by the censored (non-detect) and detect count fields in the table.

mg/kg milligrams per kilogram
Max maximum concentration
Min minimum concentration
pCi/g picocuries per gram
Q1 1st quartile (25th percentile)
Q3 3rd quartile (75th percentile)

TABLE 14
DESCRIPTIVE SUMMARY STATISTICS FOR BACKGROUND METALS AND RADIONUCLIDES – Qal RIVER (>10 FT BGS)
BRC BACKGROUND SOIL COMPILATION REPORT
CLARK COUNTY, NEVADA

Analyte Group	Analyte	Sample Size	Detection Frequency	Censored (Non-Detect) Data							Detected Data						
				ND Count	Min	Q1	Median	Mean	Q3	Max	Detect Count	Min	Q1	Median	Mean	Q3	Max
Metals (mg/kg)	Aluminum	36	100.0%	0	--	--	--	--	--	--	36	5680	7860	8360	8610	8900	13400
	Antimony	36	100.0%	0	--	--	--	--	--	--	36	0.14	0.193	0.21	0.222	0.238	0.37
	Arsenic	36	100.0%	0	--	--	--	--	--	--	36	4.7	5.75	7.2	7.51	8.18	13.9
	Barium	36	100.0%	0	--	--	--	--	--	--	36	188	269	329	399	478	1350
	Beryllium	36	100.0%	0	--	--	--	--	--	--	36	0.34	0.44	0.46	0.471	0.515	0.72
	Boron	36	22.2%	28	2.824	2.82	2.82	2.82	2.82	2.824	8	5	5.45	6.15	8.36	7.18	24.1
	Cadmium	36	72.2%	10	0.01	0.01	0.01	0.01	0.01	0.01	26	0.034	0.0748	0.0985	0.096	0.12	0.16
	Calcium	36	100.0%	0	--	--	--	--	--	--	36	4680	16800	22000	21700	27700	45600
	Chromium (Total)	36	100.0%	0	--	--	--	--	--	--	36	7.2	9.43	10.4	11.1	11.4	24.2
	Chromium (VI)	41	39.0%	25	0.16	0.16	0.16	0.167	0.17	0.2	16	0.16	0.22	0.375	0.409	0.538	1.1
	Cobalt	36	100.0%	0	--	--	--	--	--	--	36	3.5	4.2	4.6	4.61	5.08	5.7
	Copper	36	100.0%	0	--	--	--	--	--	--	36	8	9.23	10.3	10.3	11	13.9
	Iron	36	100.0%	0	--	--	--	--	--	--	36	7250	9320	10900	10500	11800	13100
	Lead	36	100.0%	0	--	--	--	--	--	--	36	9.5	10.6	11.8	14.1	13.9	35.1
	Lithium	36	100.0%	0	--	--	--	--	--	--	36	20	25.2	30.3	30.9	36.3	47.2
	Magnesium	36	100.0%	0	--	--	--	--	--	--	36	5210	6500	7210	7630	8690	13900
	Manganese	36	100.0%	0	--	--	--	--	--	--	36	87.5	141	162	213	263	777
	Mercury	28	17.9%	23	0.00668	0.00668	0.00668	0.00668	0.00668	0.00668	5	0.007	0.00725	0.0077	0.00832	0.0097	0.0102
	Molybdenum	36	86.1%	5	0.1046	0.105	0.105	0.105	0.105	0.1046	31	0.26	0.34	0.4	0.432	0.52	0.72
	Nickel	36	100.0%	0	--	--	--	--	--	--	36	9.2	12.3	13.3	13.3	14.8	17.5
	Niobium	36	8.3%	33	1.5118	1.51	1.51	1.51	1.51	1.5118	3	2.5	2.5	2.6	2.7	3	3
	Palladium	36	100.0%	0	--	--	--	--	--	--	36	0.24	0.39	0.6	0.577	0.775	1.1
	Phosphorus	36	100.0%	0	--	--	--	--	--	--	36	511	739	820	829	911	1320
	Platinum	36	0.0%	36	0.02	0.02	0.02	0.0201	0.02	0.023	0	--	--	--	--	--	--
	Potassium	36	100.0%	0	--	--	--	--	--	--	36	2560	2950	3330	4370	5030	12600
	Selenium	36	0.0%	36	0.32	0.32	0.32	0.321	0.32	0.36	0	--	--	--	--	--	--
	Silicon	36	100.0%	0	--	--	--	--	--	--	36	224	451	618	634	797	1340
	Silver	36	100.0%	0	--	--	--	--	--	--	36	0.046	0.0695	0.12	0.194	0.245	1.4
	Sodium	36	100.0%	0	--	--	--	--	--	--	36	600	942	1250	1400	1890	2770
	Strontium	36	100.0%	0	--	--	--	--	--	--	36	146	202	252	270	312	559
	Thallium	36	0.0%	36	0.2	0.2	0.2	0.201	0.2	0.23	0	--	--	--	--	--	--
	Tin	36	44.4%	20	0.0526	0.0526	0.0526	0.0529	0.0526	0.059	16	0.25	0.323	0.355	0.366	0.418	0.49
	Titanium	36	100.0%	0	--	--	--	--	--	--	36	309	440	525	515	589	712
	Tungsten	36	25.0%	27	0.2	0.2	0.2	0.201	0.2	0.23	9	0.26	0.265	0.38	0.398	0.525	0.6
	Uranium	36	100.0%	0	--	--	--	--	--	--	36	0.64	0.885	1.2	1.15	1.38	2.2
	Vanadium	36	100.0%	0	--	--	--	--	--	--	36	24.6	28	31.3	31.8	35.8	40.9
	Zinc	36	100.0%	0	--	--	--	--	--	--	36	25.5	33.8	37.9	39.6	42.4	68.2
	Zirconium	36	80.6%	7	0.5	0.5	0.5	0.509	0.5	0.56	29	10	13.5	15.9	15.7	17.6	20.5
Radionuclides (pCi/g)[a]	Radium-226	28	100.0%	0	--	--	--	--	--	--	28	0.491	0.781	0.984	0.966	1.14	1.39
	Radium-228	28	--	0	--	--	--	--	--	--	28	0.879	1.08	1.37	1.3	1.48	1.76
	Thorium-228	33	100.0%	0	--	--	--	--	--	--	33	0.944	1.26	1.38	1.38	1.5	1.71
	Thorium-230	33	100.0%	0	--	--	--	--	--	--	33	0.552	0.831	1.02	1.03	1.14	1.85
	Thorium-232	33	100.0%	0	--	--	--	--	--	--	33	0.898	1.14	1.35	1.31	1.45	1.67
	Uranium-233/234	34	91.2%	3	--	--	--	--	--	--	31	0.641	0.892	1.04	1.1	1.22	2.1
	Uranium-235/236	34	55.9%	15	--	--	--	--	--	--	19	-0.000681	0.02	0.0378	0.0372	0.0473	0.0961
	Uranium-238	34	88.2%	4	--	--	--	--	--	--	30	0.57	0.949	1	1.07	1.21	2.17

Notes:

[a]Because both non-detect and detected radionuclides have reported activity levels, calculated summary statistics are presented as detected regardless of the lab detect flag. Lab detect flags are represented by the censored (non-detect) and detect count fields in the table.

mg/kg milligrams per kilogram
Max maximum concentration
Min minimum concentration
pCi/g picocuries per gram
Q1 1st quartile (25th percentile)
Q3 3rd quartile (75th percentile)

APPENDIX A

NDEP COMMENTS AND BRC'S RESPONSE TO COMMENTS

Responses to Nevada Division of Environmental Protection (NDEP) Comments, dated February 16, 2010, to Background Soil Compilation Report dated January 2010

1. Page 1-1, 1st sentence and Figure 1. Figure 1 includes an outline of Site, and a further outline of "Site AOC3" areas, however, this is not explained in the text. It is suggested that the text explain the significance of the two areas and clarify that the background data is intended to address all of these areas. It is suggested that BRC show the Site sub-areas on the figure or provide a separate Figure, with a brief explanation that background comparisons will probably be performed for each sub-area separately. This will help convey the differences in geology across the site.

Response: *Figure 1 has been revised to include sub-area boundaries within Eastside, and the text has been expanded on page 1-1 to explain and distinguish between the two areas defined in Figure 1 ("Site AOC3" and "Soil Site" areas). The text has also been expanded to explain that background comparisons will be performed as part of the closure process for each sub-area.*

2. Finally, although this is not BRC's domain, these background data will also be applied to risk assessments throughout the region. For example, TIMET and the City of Henderson were involved in the collection of some of the datasets which are contained within this report.

Response: *The text has been expanded on page 1-1 as suggested in the comment to explain that these background data may be used in risk assessments throughout the region.*

3. Page 1-1; 2nd paragraph. This document should provide some direction with respect to the way these data can be used. One way to accomplish this is to take specific examples from each background report to demonstrate this. One of the purposes of assembling several background datasets was to address the previous issue of not having suitable background datasets for comparison with different sub-areas across the site. It would be helpful if this was addressed both with a brief description of the salient geologic features that led to the successive background sampling campaigns, tied to discussion of the different sub-areas (including those from other Companies), and tied to some discussion of the results (perhaps in Chapter 3), which at least could provide a summary of what to look for (e.g., geologic differences, depth differences, etc.). BRC could also discuss how some geologic units have been found to be statistically similar and other have been found to be different.

Response: *Evaluation of the appropriate way(s) in which to use the data will be performed on a sub-area-specific basis as part of each human health risk assessment. Because of this, it is difficult to provide specific direction in this report. BRC has expanded the text in Section 2 to provide a little more explanation as to the geological reasons for collecting the various data sets and a general discussion of the types of things that would affect dataset use. Also, although we recognize that others may use these data, BRC does not have appropriate information nor control to detail how these data will or should be used by the other Companies.*

4. Page 2-1; 1st paragraph under bullets. Please clarify why the 2003 background dataset is combined with the 2005 Shallow Background dataset in Table 1. These data were collected

during different sampling events and it is unclear why these data were combined. Some discussion is needed to connect the text (bullets) here to the tables.

Response: *It was BRC's understanding that this report was to be a compilation of the various datasets presented in the three background reports that preceded this report, namely: the 2007 shallow soil background report prepared by TIMET and BRC, the 2009 BRC supplemental soil sampling report, and the 2009 BRC Deep background report. The primary purpose of this compilation was to provide a single reference that could be cited in reports using the background datasets. The 2003 and 2005 datasets were combined in Table 1 for consistency with the 2007 BRC/TIMET report, which combined the results into a single dataset after concluding that these datasets were comparable and could be combined for further statistical evaluation and comparisons. To reduce reader confusion, the text has been expanded on page 2-2 to explain this presentation approach.*

5. Page 2-1; Section 2.1, 1st sentence. Figure 2 is referenced in this sentence, but does not contain the sample location identifiers that are referenced in this sentence. Note that identifiers are included in Figure 3, although these are not the same identifiers that are presented in the text (they are shortened on the figures). Some clarification is needed. This is a global comment and will not be repeated. Please clarify.

Response: *Figure 2 has been revised to include sample identifiers, as in Figure 3. For clarity of presentation, the identifiers included on Figure 3 were truncated as noted in NDEP's comment. The legend on Figure 3 notes the naming conventions associated with the truncated sample identifiers for each dataset; however, to avoid reader confusion, an explanation of the naming conventions and truncated identifiers has been added to on page 2-2 of the text. In addition, the text has been expanded to include references to the color coding used in the figures to reflect the various sampling events.*

6. Page 2-1; Section 2.1, 1st sentence. Figure 3 shows the geology of the site, but this figure is not described. It would help if this figure was described in the context of the background investigations that were undertaken.

Response: *Text discussing Figure 3 has been added to the introductory portion of Section 2 on page 2-1.*

7. Page 2-2; 1st paragraph, 2nd sentence. Reference is made to 17 samples from the Environ background data collection event. This is not consistent with the data used in the background reports or in this report. There are 16 sample results that are used from this study. Please clarify.

Response: *The text has been revised to clarify on page 2-3 that 17 samples were collected (including a field duplicate), but that only the 16 primary samples were included in the dataset.*

8. Page 2-2; 2nd paragraph, 1st sentence and lower down in paragraph. Neptune and Company should be referenced as Neptune and Company, Inc. If a parenthetical (Neptune) is included

next to the first use, then it could be used in the second instance. Alternatively, reference to Neptune's involvement could be removed to a footnote.

Response: *The reference to the company name has been changed as noted on page 2-3.*

9. Page 2-2; 2nd paragraph, 3rd sentence. The reference that is cited for this sentence is incorrect. This should be referencing USEPA 2004b. It is noted that this issue occurs in numerous locations. NDEP has attempted to identify all of these below for ease of reference by BRC. Please verify that all instances are addressed.

Response: *The citations for USEPA 2004a and 2004b have been corrected in the report.*

10. Page 2-2; Section 2.2, last sentence. Please give more specifics or a reference pointing to those metals and radionuclides that are of interest at the site, such as the site-related chemical (SRC) list (it is noted that this is referenced on the next page and the reference could be moved up).

Response: *The sentence in question was modified on page 2-3to remove the reference to metals and radionuclides "that are of interest at the site," deferring the specifics to the discussion later in this section in which the SRC list is referenced.*

11. Page 2-3; 3rd paragraph, 3rd sentence. The reference cited is incorrect. Please change USEPA 2004a to USEPA 2004b.

Response: *The citations for USEPA 2004a and 2004b have been corrected in the report.*

12. Page 2-3; 3rd paragraph, 4th sentence. The reference cited is incorrect. Please change USEPA 2004b to USEPA 2004a.

Response: *The citations for USEPA 2004a and 2004b have been corrected in the report.*

13. Page 2-3, footnote 4. Please clarify which sample is being referenced and please clarify how the total of 104 samples was arrived at.

Response: *The footnote (now 6) has been expanded on page 2-4 to identify the step-out sampling location in question (BRC-BKG-05) and to clarify the tally of 104 samples.*

14. Section 2.3, 1st paragraph, 2nd sentence. This Section could benefit from specific findings with respect to differences that were found between the 2008 north river and the 2005 south river datasets. Specifically, the previous background study included samples from the River Mountain sediments, in which case it is not clear here why more River Mountain sediment samples are being taken. Please clarify.

Response: *The section has been revised on page 2-5 to explain that the earlier River datasets resulted in background comparison failures for arsenic in areas not known to have had arsenic impacts, and that the 2008 investigation was performed to explore the possibility that the eastern part of the site exhibits different background levels of arsenic and, potentially, other metals.*

15. Page 2-4; 3rd paragraph, 1st sentence. Some explanation of the difference between the 38 metals included here, and the 43 analytes included in the BRC/TIMET background datasets would be helpful. It seems that 5 non-metals were removed, which is reasonable, however, some explanation is needed.

Response: *In response to this comment, a footnote has been added on page 2-5 to explain that chloride, fluoride, nitrate, nitrite, and sulfate were included in the BRC/TIMET analytical suite, but were omitted from the subsequent investigations.*

16. Page 2-4; 4th paragraph, 3rd sentence. The reference cited is incorrect. Please change USEPA 2004a to USEPA 2004b.

Response: *The citations for USEPA 2004a and 2004b have been corrected in the report.*

17. Page 2-5; 2nd paragraph. The 1st sentence 1st list item of this paragraph is unclear. No discussion has occurred in other Section 2 subsections about comparison of Site data to background. Please clarify. In addition, the term chemical has been used here, whereas metals and radionuclides have been used elsewhere, please make this consistent.

Response: *Text added to Section 2 in response to previous comments has discussed comparisons of Site data to background. To further clarify, the first list item on page 2-6 has been expanded to include references to this process. In addition, the term "chemical" has been removed and/or replaced with "metals and radionuclides."*

18. Page 2-6; 2nd paragraph below lists, 3rd sentence. 173 samples were collected and analyzed. Please clarify to which geologic units these samples apply

Response: *Text has been added on page 2-8 to specify the break-down of samples per geologic unit.*

19. Page 2-7; 2nd to last sentence. Page 2-3; 3rd paragraph, 4th sentence. The reference cited is incorrect. Please change USEPA 2004a to USEPA 2004b.

Response: *The citations for USEPA 2004a and 2004b have been corrected in the report.*

20. Page 3-1; 1st paragraph under table, 1st sentence. The reference to Tables 2 through 14 should include some description in the text as to what they are summarizing. For example, there is nothing in the text nor in the table on page 3-1 that indicates why the Qal data would be summarized across all depths (e.g., Table 2) as well as all lithologic units (e.g., Tables 3

and 4). From a users' perspective this could come across as being confusing with respect to how best to use these data. More discussion that describes the rationale underlying the approach to summarizing these data would be helpful. In general it would help if this document described the background studies to include chronology, geologic units and depth layers. Each subsection could also show the number of samples collected for each unit, so that the text clearly matches the tables, and could explain why or how different units are different statistically (not by metal or radionuclide, but just in general).

Response: *The subject text has been expanded to explain the data groupings summarized in the tables and to more clearly match the tables. As previously noted in responses to prior comments, evaluation of the appropriate way(s) in which to use the data and the specific data that will be applied to a given sub-area will be determined on a sub-area-specific basis as part of each human health risk assessment and is beyond the scope of this report.*

21. Figure 2. Specific site locations as given on Figure 3 would also be helpful here. Some connection between sample number on Figure 3 and sample IDs as presented in the text should also be given.

Response: *Sample location identifiers as presented in Figure 3 have been added to Figure 2, and as noted in the response to Comment #5, the text in Section 2 has been revised to better explain the connection between the truncated sample identifiers on the figures and the full identifiers presented in the text.*

22. Table 1. There are issues with the 2005 BRC/TIMET Shallow summary column. The data that were included on CD in Appendix B indicate that phosphorous has 104 samples and a detection frequency of 100%. In the table, there are dashed lines. The number of detects for tin is also incorrect. Tin should have 103 detects out of a total of 104 samples and a detection frequency of 99%. Please clarify. There are also errors in the calculation of detection frequency for several analytes: silver, strontium, sulfate, and thallium. Please clarify. These errors were also discovered in Table 2 of the 2009 Deep Soils Background report, however, they are correct in the 2009 Supplemental Background report.

Response: *The errors in Table 1 that are mentioned in NDEP's comment have been corrected in the revised report.*

23. Tables 1-14. For radionuclides, the frequency of detection column should have a footnote associated with it that indicates that 100% of the data were or should be used for all statistical analyses.

Response: *A footnote has been added to the tables referenced in NDEP's comment, as suggested.*

24. Tables 2-14, titles. The table titles are not sufficiently descriptive. It is not clear to what the parenthetical part of the title refers. In general, more discussion is needed of these tables in

the text, and connectivity between the text and the tables. This should include some presentation in the text of sample sizes that appear in the tables.

Response: *The titles of these tables have been revised to be more descriptive of the datasets being summarized within them. The text in Section 3 has been expanded to include additional discussion of these tables.*

REDLINE/STRIKEOUT TEXT

1.0 INTRODUCTION

On behalf of Basic Remediation Company (BRC), ERM-West, Inc. (ERM) has prepared this Background Soil Compilation Report applicable to the Basic Management, Inc. (BMI) Complex and Common Areas in Clark County, Nevada. ~~(~~Figure 1 shows features associated with the BMI Complex and Common Areas, and depicts the areas for which BRC has taken responsibility for remediation based on the *Settlement Agreement and Administrative Order on Consent: BMI Common Areas, Phase 3* (AOC3; boundary shown on Figure 1). For portions of the AOC3 area (*i.e.*, those areas denoted with blue shading) the Nevada Division of Environmental Protection (NDEP) has granted No Further Action Determinations (NFADs) for Site soils.[1] For the remaining portions of the AOC3 area (*i.e.*, areas denoted with green shading), the characterization, remediation, and closure process for Site soils is currently underway. For the purposes of this report, these latter (green) areas, excluding the Corrective Action Management Unit (CAMU) west of Boulder Highway, are defined as the "Site" (also referred to as "Eastside").

As described in the *BRC Closure Plan* for the BMI Common Areas (BRC *et al*. 2007; hereinafter "Closure Plan") BRC will compare residual chemical concentrations in ~~BMI Common Areas (the properties east of Boulder Highway, hereinafter "Eastside" or "~~Site~~")~~ soils~~soils will be compared~~ to background concentrations as part of the risk assessment that will be performed during the closure process for each sub-area at the Site (sub-area boundaries depicted on Figure 1)~~Closure~~. Soil data have been collected by BRC and others during various sampling events to establish background conditions for the Site and BMI Complex. This report presents each of the background datasets that have been collected, and that may be used by BRC for closure purposes in risk assessments for the Site, and by others in areas throughout the region depicted in Figure 1.

The ~~sole~~ purpose of this report is to compile all of the various background investigations and datasets into a single document. It does provide general descriptive summary statistics for each of the stratigraphic units and depths profiles, as presented in each of the individual background investigation reports, but it does not present any comparative statistical analyses. Evaluation of the appropriate way(s) in which to use the data will be performed on a site-specific basis. Because of this, this report provides only general discussions regarding~~, nor does it suggest~~ how and where these background datasets might ~~should~~ be used. The user of these data should

[1] The following parcels have been granted an NFAD within the Eastside property; Nevada Power Substation (March 27, 2000), Parcel 4A (May 15, 2008), Parcel 4B (November 12, 2009), and Utility Corridor (October 19, 2009).

evaluate and select which is most appropriate for their particular site. In other words, data usability is the responsibility of the user of these data and is not discussed nor evaluated in this report.

This revisioninitial version of the Background Compilation Report, Revision 1, incorporates comments received from the NDEP, on Revision 0 of the report, dated January 2010Nevada Division of Environmental Protection (NDEP) on previously submitted background investigation reports prepared for the Site. The NDEP comments and BRC's response to these comments are not included in; however, Appendix A. Also included in Appendix A is a redline/strikeout version of the text showing the revisions from the January 2010 version of the is provided as a placeholder for potential future iterations of this report. An electronic version of the entire report, including original format files (MS Word and MS Excel) of all text and tables, as well as an electronic version of the background dataset are included in Appendix B.

2.0 BACKGROUND SOIL SAMPLING EVENTS

The areal extent of the Eastside and other Company properties in the Henderson area is fairly large (more than 3,700 acres), and the geologic strata vary across this region. As seen in Figure 2, the AOC3 area and adjacent BMI industrial complex are situated at the base of the River Mountains to the east and the McCullough Range to the southwest, which suggests that the soils in this area are derived from these two different sources.

This assumption is corroborated by the identification of "Pediment and fan deposits of the River Mountains" to the east and "Pediment and fan deposits of Henderson" to the south and west in regional geologic maps of the area (Nevada Bureau of Mines and Geology [NBMG] 1980). The mineralogical composition of the latter materials, which are noted in the geologic map as being derived from the McCullough Range, is "predominantly…dacite clasts," whereas the River Mountain-derived sediments are "dominantly…dacite clasts with locally high concentrations of basalt, tuff, and sedimentary clasts" (NBMG 1980). Given these differences, it follows that naturally-occurring background conditions vary across the Eastside and BMI Complex depending on the underlying geologic strata of a given area. Figure 3, which superimposes a recent aerial photograph over a soils map reproduced from the U.S. Department of Agriculture (USDA) Soil Survey Geographic (SSURGO) database, illustrates the variation in soil types across the entire area.

Given these geologic/soil composition variations, BRC and others undertook multiple field investigations to gather background data associated with a variety of geologic conditions in the Eastside and BMI Complex vicinity. The goal was to collect data pools suitable for use in background comparisons that would be performed in risk assessments for individual sub-areas within the Eastside and BMI Complex properties, This section discusses the following ~~identifies the~~ four field investigations during which background soil data relevant to the Eastside~~Site~~ and BMI Complex were collected~~. These investigations are~~:

- A shallow background soil sampling event conducted in 2003 by Environ International Corporation (Environ) for the City of Henderson;
- A shallow background soil sampling event jointly conducted in 2005 by BRC and the Titanium Metals Corporation (TIMET);
- A supplemental shallow background soil sampling event conducted in 2008 by BRC; and
- A deep background soil sampling event conducted in 2008 by BRC.

These events are briefly described in the following sub-sections, and the associated sampling locations are depicted on Figures 2 and 3. For presentation clarity, the sample location identifiers included on these figures have been truncated for several of the sampling events, eliminating the naming convention prefix assigned during the associated event. For reference and to enable the reader to locate location-specific data in the database excerpt, the prefixes assigned during these events are provided in the Figure legends. For example, the green circular symbol on Figure 3 that is labeled "12" corresponds to sample location "BRC-BKG-12," which was collected during the 2005 BRC/TIMET investigation.

The detection frequencies for metals and radionuclides[2] evaluated during each of these investigations are presented in Table 1. It should be noted that for consistency with the *Background Shallow Soil Summary Report* (BRC and TIMET 2007), Table 1 combines the datasets derived from the 2003 City of Henderson investigation and the 2005 BMI/TIMET investigation. Even though the associated data represent the results of two separate studies, the conclusions of the 2007 BRC/TIMET report were that these datasets were comparable and could be combined for further statistical evaluation and comparisons. Detailed descriptions of the scope of work, sampling procedures, results, and data and statistical evaluations are provided in the associated reports listed in each section.

2.1 2003 CITY OF HENDERSON SAMPLING EVENT

During this sampling event, Environ collected samples from eight locations southwest of the Site (Figures 2 and 3, locations BG01 through BG08, yellow circular symbols), in accordance with a March 2002 work plan submitted to NDEP. These sample locations are presumed reflective of sediments derived from McCullough Range and/or the River Mountains[3] as follows:

McCullough Range Source	River Mountain Source	Mixed Source
• BG01	• BG05	• BG04
• BG02	• BG06	
• BG03	• BG07	
	• BG08	

[2] With NDEP concurrence, the project list of analytes was reduced in 2007 from 35 radionuclides to the following eight: uranium-238, uranium-233/234, thorium-230, and radium-226 (Uranium-238 Decay Chain), thorium-232, radium-228, and thorium-228 (Thorium-232 Decay Chain) and uranium-235/236 (Uranium-235 Decay Chain). Only these radionuclides are included in this Background Soil Compilation Report (and electronic dataset).

[3] This distinction between the various presumed sources was not made at the time of the 2003 study, but was done as part of the 2007 report for the 2005 BRC/TIMET background investigation (see Section 2.2).

Samples from (1) the 0 to 1 foot bgs interval; and (2) a deeper interval (ranging from 3 to 4 feet bgs) were collected from each boring. Sixteen (16Seventeen (17) independent samples were collected during this event.[4] Sample analyses consisted of a suite of 24 metals[5] and 18 radionuclides. The scope and results of this field investigation were presented in Appendix E of *Risk Assessment for the Water Reclamation Facility Expansion Site, Henderson, Nevada* (Environ 2003).

As summarized in the report for the BRC/TIMET 2005 Shallow Soil Sampling Event (see Section 2.2 below), a quality assurance/quality control (QA/QC) review was conducted on this dataset by Neptune and Company, Inc. (Neptune; (consultant for NDEP) upon direction by NDEP. It was not possible to conduct a full validation, as the analytical laboratory reports contained only QC summaries, and did not contain raw data, instrument calibration data, instrument reporting criteria, or internal standard data. Metals data were reviewed in accordance with the U.S. Environmental Protection Agency (USEPA) guidance document *U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (USEPA 2004a). Neptune and Company used professional judgment and analytical method requirements for the radionuclide QA/QC review. The QA/QC review determined that the Environ dataset was usable for the intended purpose (*i.e.*, as background data) with the exception of the hexavalent chromium and radium-224, -226, and -228 data.

2.2 2005 SHALLOW BACKGROUND SOIL SAMPLING EVENT

This sampling event was conducted in accordance with the *Background Soil Sampling Workplan for BMI Common Areas and Complex Vicinity* (ERM and Tetra Tech 2005), which was approved with comments by the NDEP on May 27, 2005. That work plan was prepared and implemented jointly by BRC and TIMET, whose properties were located near each other and had similar geology and soil types. Since that time, TIMET has sold their property within the Eastside (the TIMET Ponds sub-area) to BRC. The scope and results of this field investigation, including a statistical analysis of the results, were presented in *Background Shallow Soil Summary Report – BMI Complex and Common Areas Vicinity* (BRC/TIMET 2007).

The general scope of work included the collection of soil samples from 11 locations on undeveloped properties upgradient of the Site (Figures 2 and 3, location IDs BRC-BKG-01

[4] A field duplicate sample was also collected during this event, but was not included in the dataset.
[5] This suite of metals is a subset of those included in the list of Site-Related Chemicals that was subsequently established for the project (BRC *et al.* 2007).

through -09, -11, and -12; green circular symbols). These samples were analyzed for metals and radionuclides ~~that are of interest at the Site~~. With the exception of location BRC-BKG-12, all of these locations are presumed reflective of sediments derived from the McCullough Range. BRC-BKG-12 is located at the junction of McCullough and River derived sediments. Three borings were advanced at each location, and samples representative of (1) the 0 to 0.5 foot bgs interval; (2) the 4 to 6 foot bgs interval; and (3) the 9 to 11 foot bgs interval were collected from each boring. A total of 104 independent samples[6] and three split samples were collected during this event.

Sample analyses consisted of a full suite of metals (43 individual constituents, including all the metals in the current Site-Related Chemical list) and radionuclides (35 isomers). These analytes and methods were consistent with the BRC and TIMET site-related chemicals list and analytical program previously established for the BMI Common Areas project (BRC *et al*. 2007) and the TIMET site (Tetra Tech 2004). All radionuclide analyses underwent full dissolution preparatory methods.

The data were subjected to a data review consisting of full validation for 10 percent of the dataset, and partial validation for the remaining 90 percent. The results of that data review were presented in *Background Shallow Soil Summary Report – BMI Complex and Common Areas Vicinity* (BRC/TIMET 2007); approved by NDEP on July 7, 2007. Metals data were validated in accordance with the USEPA guidance document *U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (USEPA 2004a) and *Region 9 Superfund Data Evaluation/Validation Guidance* (USEPA 2001). USEPA has not standardized the validation of radionuclide data. Radionuclide validation was conducted using several documents, including the USEPA document *Multi-Agency Radiological Laboratory Analytical Protocols Manual (MARLAP)* (USEPA 2004b) the U.S. Department of Energy (DOE) reference document *Evaluation of Radiochemical Data Usability* (DOE 1997), and QC requirements and criteria summarized in the applicable methods.

[6] This sampling approach (11 locations, 3 borings at each, and 3 samples from each boring) would have resulted in a total of 99 samples. However, at location BRC-BKG-05, after collecting shallow soil samples a subsurface obstruction was encountered and the location was moved (step-out locations BRC-BKG-5AR, -5BR, and -5CR are not shown on the figures given the scale). The shallow samples from the initial BRC-BKG-05 sampling location (4 samples) were submitted for analysis as well as the samples from the step-out location. In addition, a fourth sample was collected from BRC-BKG-04, boring C. These extra five samples raised the tally to 104 samples.~~ Additional samples were collected at one location due to step-outs performed in response to the presence of a subsurface obstruction.~~

2.3 2008 SUPPLEMENTAL SHALLOW BACKGROUND SOIL SAMPLING EVENT

This sampling event was conducted in accordance with the *Supplemental Background Shallow Soil Sampling and Analysis Plan – BMI Complex and Common Areas Vicinity, Clark County, Nevada* (BRC 2008), which was approved by the NDEP in March 2008. The purpose of this investigation was to collect and analyze data for metals and radionuclides in background shallow soils that are comparable to site soils in geologic units not covered by the 2005 background dataset described above, specifically, sediments derived from the River Mountains. This supplemental background study was primarily undertaken because background comparisons for arsenic (using the then-available datasets) performed for both the Mohawk and Parcel 4B sub-areas indicated that arsenic was present at concentrations higher than background. However, there is no history of arsenic contamination at these sites; therefore, the supplemental shallow sampling was performed to explore the possibility that the eastern part of the site exhibits different background levels of arsenic and, potentially, other metals. The supplemental shallow soil background sampling event specifically targeted the lithologic units defined as "Pediment and fan deposits of the River Mountains" depicted as being located in the eastern-most corner of the Common Areas[7] in the NBMG geologic map (NBMG 1980). This part of Eastside is close to the northern part of the River Mountains range. The scope and results of this field investigation, including a statistical analysis of the results, were presented in *2008 Supplemental Shallow Soil Background Report - BMI Common Areas (Eastside), Clark County, Nevada* (BRC and ERM 2009a).

The scope of work included the collection of soil samples from 10 sampling locations adjacent to Lake Mead Parkway, on the south side of the roadway across from the Site. These 10 locations are shown on Figures 2 and 3 (location IDs BRC-BKG-R01 through -R10; orange circular symbols). Samples representative of (1) the 0 to 0.5 foot bgs interval; (2) the 4 to 6 foot bgs interval; and (3) the 9 to 11 foot bgs interval were collected from each boring. A total of 33 independent samples, including field duplicates, were collected during this event. The report entitled *Supplemental Shallow Background Data Set* (GES 2008), describes the drilling and sampling procedures, including detailed boring logs for each drilling location.

Sample analyses included a full suite of metals (38 individual metals[8]) and eight radionuclides (radium-226, radium-228, thorium-228, thorium-230, thorium-232, uranium-233/234, uranium-

[7] These units fall within the Mohawk sub-area and the eastern portion of Parcel 4B.
[8] As seen in Table 1, chloride, fluoride, nitrate, nitrite, and sulfate were included in the BRC/TIMET analytical suite, but were omitted from subsequent background investigations.

235/236, and uranium-238). These analytes and methods are consistent with the BRC site-related chemicals list and analytical program established in the *BRC Quality Assurance Project Plan* (QAPP; BRC and ERM 2009). All radionuclide analyses underwent full dissolution preparatory methods. All preparatory methods and analyses are consistent with the 2005 BRC/TIMET background dataset.

All of the data were subjected to a Level 3 review. In addition to the Level 3 review, 20 percent of all data collected during the course of the investigation were subjected to full Level 4 data validation. Level 3 and 4 reviews are provided in the *Data Validation Summary Report (DVSR)—2008 Supplemental Shallow Soil Background Sampling Event* (BRC and ERM 2008a; approved by NDEP on June 9, 2008). Metals data were validated in accordance with the USEPA guidance document *U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (USEPA 2004a) and the data validation standard operating procedure (SOP-40; BRC, ERM and MWH 2009). USEPA has not standardized the validation of radionuclide data. Radionuclide results for supplemental shallow background soil samples were validated in accordance with SOP-40 (BRC, ERM and MWH 2009) and the project QAPP (BRC and ERM 2009b).

2.4 2008 DEEP BACKGROUND SOIL SAMPLING EVENT

This sampling event was conducted in accordance with the *Revised Work Plan for Determination of Deep Quaternary Alluvium and Upper Muddy Creek Formation Background Soil Chemistry and Upgradient Alluvial Aquifer Conditions – BMI Common Areas and Complex Vicinity* (Daniel B Stevens & Associates [DBSA] 2007), which was approved by the NDEP on June 12, 2007. The primary purpose of this investigation was to collect and analyze data for metals and radionuclides in background deep soils that are comparable to Site soils in geologic units and depths not covered by the existing *Background Shallow Soil Summary Report* (BRC/TIMET 2007) and *2008 Supplemental Shallow Soil Background Report* (BRC and ERM 2009a) datasets, which address shallower (0 to 10 feet below ground surface [bgs]) stratigraphic intervals. The results of this field investigation, including all statistical analyses, were presented in *2008 Deep Soil Background Report - BMI Common Areas (Eastside), Clark County, Nevada* (BRC and ERM 2009c).

This deep background study was primarily undertaken because:

1) Insufficient~~insufficient~~ background ~~chemical~~ data exist to evaluate whether concentrations of metals and/or radionuclides~~certain Site-related chemicals~~ in deeper Site samples

statistically exceed concentrations of these constituentschemicals in background soils (*i.e.*, as would be determined from comparisons of Site data to, and 2) insufficient background that will be conducted as part of the risk assessment for a given area, as discussed previously in this report); and

2) Insufficient backgroundchemical data exist for the Upper Muddy Creek formation (UMCf), which outcrops to the northeast of the Site. The UMCf is near the ground surface in certain areas of the Common Areas (*i.e.*, within the Western Hook sub-areas), but does not appear to outcrop within the Site. As presented in the two shallow background soil summary reports identified above (BRC/TIMET 2007; BRC and ERM 2009a), the existing datasets focused on shallow Quaternary alluvium (Qal) soils (*i.e.*, surface to 10 feet bgs) and did not include data for the UMCf.

The general scope of work included the collection of soil samples from 21 background areas upgradient of the BMI Complex and Common Areas and analysis of these samples for Site-related metals and radionuclides for determining background concentrations. These 21 locations (Figures 2 and 3; dark red circular symbols) are within map units 117, 182, and 184 with presumed source material as follows:

McCullough Range Source

- DBSA-01
- DBSA-02
- DBSA-03
- DBSA-04
- DBSA-08
- DBSA-09
- DBSA-10
- DBSA-11
- DBSA-13
- DBSA-14
- DBSA-15

River Mountain Source

- DBSA-23
- DBSA-26
- DBSA-27
- DBSA-29
- DBSA-30[9]
- DBSA-32
- DBSA-33

Mixed Source

- DBSA-17
- DBSA-20
- DBSA-21

The underlying UMCf was assumed to be the same unit across the study area, and all data collected from the UMCf were compiled into a single dataset.

Soil samples were collected at 10-foot intervals at 21 sampling locations, from surface soil (0 to 0.5 feet bgs), to a maximum of 160 feet bgs. Of these samples, a subset was submitted for laboratory analysis. A total of 163~~173~~ soil samples (79 from Qal-McCullough, 24 from Qal-Mixed, 36 from Qal-River, and 24 from UMCf) were collected and analyzed for metals and radionuclides as part of this investigation. The report entitled *Deep Background Investigation Report* (GES 2007), describes the drilling and sampling procedures, including detailed boring logs for each drilling location.

Sample analyses included a full suite of metals (38 individual metals), and eight radionuclides (radium-226, radium-228, thorium-228, thorium-230, thorium-232, uranium-233/234, uranium-235/236, and uranium-238). These analytes and methods are consistent with the BRC site-related chemicals list and analytical program previously established in the BRC QAPP (BRC and ERM 2009b). All radionuclide analyses underwent full dissolution preparatory methods. All preparatory methods and analyses are consistent with the 2005 BRC/TIMET background dataset.

[9] Original interpretation of the boring log for DBSA-30 indicated that the UMCf contact was identified based on the presence of clay at 148 feet bgs—accordingly, the 130 and 140 ft bgs samples were assigned to Qal/River. However, further scrutiny of the boring log reveals that soils overlying the clay UMCf are clayey sands with distinct clay beds, and may represent transitional UMCf. Based on this and the observed similarity in metal concentrations in the 130 ft bgs, 140 ft bgs, 150 ft bgs, and 160 ft bgs samples, data associated with the 130 ft bgs and 140 ft bgs samples were re-assigned to the UMCf dataset.

All of the data were subjected to a Level 3 review. In addition to the Level 3 review, 20 percent of all data collected during the course of the investigation were subjected to full Level 4 data validation. Level 3 and 4 reviews are provided in the *Data Validation Summary Report (DVSR) - Deep Background Soil Investigation – August-October 2007 (Dataset 34c) – BMI Common Areas (Eastside), Clark County, Nevada* (BRC and ERM 2008b; approved by NDEP in June 25, 2008). Metals sample results were validated in accordance with *U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (USEPA 2004a). USEPA has not standardized the validation of radionuclide data. Radionuclide results for deep background soil samples were validated in accordance with SOP-40 (BRC, ERM and MWH 2009) and the project QAPP (BRC and ERM 2009b).

3.0 BACKGROUND SOIL DATASETS

The data generated from the background investigations listed in Section 2 have been assigned to the following datasets:

Depth Interval	Unit	Sample Locations (Event)
Shallow Qal Soil (0 to 10 ft bgs)	McCullough	BG01 through BG03 (2003 Environ dataset) BRC-BKG-01 through -09 and BRC-BKG -11 (2005 Shallow event);
	River – South[10~~6~~]	BG05 through BG08 (2003 Environ dataset)
	River – North[10] ~~North[6]~~	BRC-BKG-R01 through –R10 (2008 Supplemental Shallow event)
	Mixed	BG04 (2003 Environ dataset) BRC-BKG-12 (2005 Shallow event)
Deep Qal Soil (> 10 ft bgs)	McCullough	Samples from DBSA-01 through -04, DBSA-08 through -11, and DBSA-13 through -15 (2008 Deep Soil event)
	River	Samples from DBSA-23, DBSA-26 &-27, DBSA-29 & -30, and DBSA-32 & -33 (2008 Deep Soil event)
	Mixed	Samples from DBSA-17, DBSA-20 &-21 (2008 Deep Soil event)
UMCf	All Sources	Samples from DBSA-09, DBSA-11, DBSA-17, DBSA-20, DBSA-21, DBSA-23, DBSA-27, DBSA-30, DBSA-32, and DBSA-33 (2008 Deep Soil event)

To provide a general idea of the nature of the data (*e.g.*, reporting limit variations, detection frequency),~~General~~ descriptive summary statistics for various background ~~each of these~~ datasets are presented in Tables 2 through 14. These tables represent various data combinations that could be applicable for background comparisons under different circumstances. Other groupings are also possible. Evaluation of the appropriate way(s) in which to use the data and the specific datasets to be used for a given sub-area will be performed on a sub-area-specific basis as part of

[10] As discussed in the 2008 supplemental background report, there were distinct differences observed between the 2005 and 2008 shallow River datasets. Although it may be appropriate to perform comparisons of background to Site data using either the 2008 (North) River or the 2005 (South) River datasets, given the proximity of the 2008 River dataset to the Site, this is considered the more appropriate dataset for comparison purposes. Future use of the 2005 (South) River dataset is considered unlikely. Therefore, this dataset is not included in the general descriptive summary statistics in Tables 2 through 14.

each risk assessment for closure purposes. The dataset groupings reflected in the summary tables are as follows:

Table 2	All Qal data, a 284-sample dataset combining data from all three Qal units (McCullough, Mixed and River) and all depths;
Table 3	Shallow Qal data, a 145-sample dataset combining data from all three Qal units (McCullough, Mixed and River) from depths of 0 to 10 feet bgs;
Table 4	Deep Qal data, a 139-sample dataset combining data from all three Qal units (McCullough, Mixed and River) from depths greater than 10 feet bgs;
Table 5	UMCf data, a 24-sample dataset combining all UMCf data from all locations, regardless of Qal association of shallower units;
Tables 6, 7, and 8, respectively	Datasets generated for each Qal unit, all depths (a 180-sample McCullough dataset, a 35-sample Mixed dataset, and a 69-sample River dataset);
Tables 9, 10, and 11, respectively	Datasets generated for each Qal unit, shallow data (0 to 10 feet bgs) (a 101-sample McCullough dataset, a 11-sample Mixed dataset, and a 33-sample River dataset); and
Tables 12, 13, and 14, respectively	Datasets generated for each Qal unit, deep data (>10 feet bgs) (a 79-sample McCullough dataset, a 24-sample Mixed dataset, and a 36-sample River dataset).

Appendix B contains an electronic version of all background data collected for the project. As noted in Section 1, the user of these data should evaluate and select which is most appropriate for their particular site. In other words, data usability is the responsibility of the user of these data and is not discussed nor evaluated in this report (except as noted in footnote 106 below).

[6] As discussed in the 2008 supplemental background report, there were distinct differences observed between the 2005 and 2008 shallow River datasets. Although it may be appropriate to perform comparisons of background to Site data using either the 2008 (North) River or the 2005 (South) River datasets, given the proximity of the 2008 River dataset to the Site, this is considered the more appropriate dataset for comparison purposes. Future use of the 2005 (South) River dataset is considered unlikely. Therefore, this dataset is not included in the general descriptive summary statistics in Tables 2 through 14.

4.0 REFERENCES

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APPENDIX B

ELECTRONIC DATASET AND REPORT (on CD)