

# **Appendix 17**

## **Limited Geotechnical Assessment**

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## I-515/I-215 Feasibility Study

### Henderson, Nevada

CA Group

2785 South Rainbow Boulevard | Las Vegas, Nevada 89146

August 6, 2019 | Project No. 304433001



Geotechnical | Environmental | Construction Inspection & Testing | Forensic Engineering & Expert Witness

Geophysics | Engineering Geology | Laboratory Testing | Industrial Hygiene | Occupational Safety | Air Quality | GIS

**Ninyo & Moore**

Geotechnical & Environmental Sciences Consultants

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### Henderson, Nevada

Mr. Jack Sjostrom  
CA Group  
2785 South Rainbow Boulevard | Las Vegas, Nevada 89146

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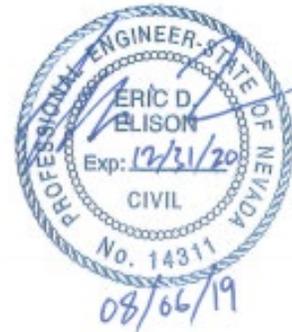
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## 1 INTRODUCTION

In accordance with your request, Ninyo & Moore has performed a limited geotechnical assessment for the subject project. We understand that the I-515/I-215 Feasibility Study will include evaluation of potential improvements along the I-515 and I-215 corridors located in Henderson, Nevada. The purpose of our limited assessment was to evaluate general geologic and geotechnical considerations along the project corridors, which are shown on Figure 1, and to provide general information regarding geotechnical conditions anticipated along the project corridors.

Additional geological/geotechnical evaluations, including performance of subsurface explorations, laboratory testing of collected soil samples, and preparation of a design-level geotechnical report, will need to be performed in the future for the project.

## 2 SCOPE OF SERVICES

The scope of our services included the following:

- Review of pertinent background data listed in the References section of this report. This information included:
  - Aerial photographs of the project area.
  - Published geologic and soils maps and literature.
  - Published groundwater-related data.
  - Findings of previous Ninyo & Moore geotechnical evaluations performed in the area of the project. Information obtained from the previous evaluations included subsurface soil conditions encountered, measured groundwater depths, and other important engineering considerations that could influence design and construction of proposed project improvements.
- Performance of a preliminary geologic and geotechnical reconnaissance along accessible portions of the corridors.
- Compilation and analysis of accumulated data.
- Preparation of this limited geotechnical evaluation report presenting findings that could impact design and construction of the project improvements, including anticipated subsurface conditions along the project corridors.

### **3 PROJECT DESCRIPTION**

The I-515/I-215 Feasibility Study will include evaluation of potential improvements to the I-515 corridor between approximately Galleria Drive and Horizon Drive, and the I-215 (Lake Mead Parkway) corridor between approximately Van Wagenen Street and Valle Verde Drive. The I-515 corridor is approximately 5.0 miles in length, and the I-215 corridor is approximately 3.4 miles in length. It is our understanding that improvement plans along these corridors include possible widening of roadways and construction of new bridges, walls, embankments, and other related structures and improvements. We understand that additional improvements may also be constructed along roadways adjacent to the project corridors as part of the project.

### **4 GENERAL SITE CONDITIONS**

The project corridors include the right-of-ways (ROW) of portions of I-515 and I-215. Roadways within these corridors are composed primarily of asphalt concrete pavement with three to four travel lanes in each direction. Several bridge structures, including fly-over bridges supported on concrete columns, are located at the I-515/I-215 interchange. Other bridges extend over local surface streets and rail lines that traverse the I-515 and I-215 corridors. On ramps, off ramps, paved shoulders, and emergency lanes are also located along roadways within the project corridors. Other improvements include light poles, signage, landscaping, and concrete sound walls. Gravel mulch covers embankment slopes and slopes along depressed portions of roadways. Gravel mulch also covers ground surface areas between travel lanes and sound walls.

The project corridors are generally bordered by residential, commercial, industrial, and resort properties. Drainage detention basins, as well as concrete- and riprap-lined drainage channels extend along portions of the I-515 alignment.

The eastern portion of I-215 (east of the I-515 interchange) transitions into Lake Mead Parkway, which includes a landscaped center median, concrete curbs, gutters, and sidewalks. Traffic control systems are located at the Lake Mead Parkway intersections at Eastgate Road/Fiesta Henderson Boulevard and West Van Wagenen Street/8<sup>th</sup> Street.

Indications of underground utilities in the area of the project corridors include sewer, water, storm drain, gas, fiber optic, and electric lines as well as traffic control system wiring. Overhead utilities include communication and high-voltage transmission lines. Other underground and overhead utility lines may also be present along the proposed alignments.

## 5 GEOLOGY

Based on Ninyo & Moore's previous project experience in the area of the subject project, and review of referenced geologic and soils data, the project corridors are underlain by deep Quaternary-age alluvium (native soil), as shown in Figure 2. Portions of the corridors are underlain by fill material associated primarily with existing roadways, embankments, and other improvements. Ninyo & Moore's findings regarding the geologic setting, and potential geologic hazards and problematic soils along the project corridors are provided in the following sections.

### 5.1 Geologic Setting

The subject corridors are located in the southeast portion of Las Vegas Valley, which lies in the southwestern portion of the Great Basin, within the Basin and Range physiographic province. Las Vegas Valley is a naturally formed structural basin as a result of block faulting, a fundamental characteristic of the Basin and Range physiographic province.

Las Vegas Valley extends in a northwest-southeast direction and drains generally toward the southeast through Las Vegas Wash into Lake Mead. Bordering the alluvium-filled valley are relatively steep mountain ranges, including the Spring Mountains to the west; the Desert, Sheep, and Las Vegas ranges to the north; the McCullough Range to the south; and Sunrise Mountain, Frenchman Mountain, and River Mountains to the east.

Las Vegas Valley is underlain at depth by Proterozoic-age igneous and metamorphic basement rock, which is overlain by thick layers of Paleozoic- and Mesozoic-age sedimentary rock, and Tertiary-age volcanic rock. The lower lying areas of Las Vegas Valley generally contain relatively fine-grained alluvial, aeolian, and playa deposits. Extending outward into the valley from the bordering mountain fronts, are sloping alluvial aprons, or fans, comprised primarily of poorly sorted gravel and sand deposits with cobbles and boulders. The soils are up to approximately 5,000 feet thick in some areas of the valley.

The southern portion of the I-515 corridor (south of the I-215 interchange) extends near a mountain in the McCullough Range. This mountain is composed primarily of volcanic rock previously mapped as Mount Davis Volcanics, which is a miocene-age dacite and andesite.

### 5.2 Potential Geologic Hazards and Problematic Soils

Ninyo & Moore's limited study included an evaluation of the possible presence of geologic hazards, such as faults and ground fissures, in the project area. This evaluation included review of published geologic and soils maps and literature, and other data listed in the References section of this report. Referenced geologic data were also reviewed to evaluate seismic activity

levels, and associated potential earthquake hazards, for faults in the project vicinity. It should be noted that the fault seismic activity levels provided in this section were obtained/interpreted primarily from United States Geological Survey (USGS, 2019b) data.

Review of referenced geologic data indicates that the nearest active fault (i.e., a fault that has experienced ground surface rupture within the past 11,000 years) is the Black Hills fault, which is located several miles south of the project. The Frenchman Mountain fault and the Eglington fault, which are considered potentially active (i.e., faults that have experienced ground surface rupture within the past 1.6 million years) are located several miles north and northwest of the project. The distances from the project corridors to these active and potentially active faults are provided in Table 1. Several other older inactive faults were mapped extending through the nearby McCullough Range. These inactive faults are not anticipated to be a design or construction concern.

Review of referenced geologic data indicates that “unnamed faults” of Las Vegas Valley were previously mapped near portions of the project corridors (Figure 4). These nearby faults extend roughly parallel to and west of the I-515 corridor. Referenced USGS data and other publications indicate that these faults are of uncertain origin and their seismic activity level has not been established. These geologic features, and other similar features in southern Nevada, are generally referred to as “compaction faults.” Proposed origins for these faults include:

- Differential natural consolidation or compaction over time of the thick alluvial and lakebed sediments in valley areas.
- Tectonic factors associated with faults that may extend into the basement bedrock beneath the valley sediment.
- A combination of differential consolidation and tectonic factors.

<b>Fault Name</b>	<b>Seismic Activity Level*</b>	<b>Approximate Distance From Project Corridors to Fault (miles)</b>
Black Hills fault	Active	6
Eglington fault	Potentially Active	16
Frenchman Mountain fault	Potentially Active	5
Unnamed faults of Las Vegas Valley	Not Established	0.2 miles south of I-215 0.3 miles west of I-515

**Note:** \*From United States Geological Survey (USGS, 2019b) data.

Ground fissures, generally believed to be caused by erosion and differential stress resulting from regional subsidence due primarily to withdrawal of groundwater, are known to occur near faults in southern Nevada. The nearest mapped zone of ground fissures is located approximately 1 mile north and 2 miles west of I-215 and I-515, respectively. Ground fissures were not observed during our preliminary site reconnaissance. However, it should be noted that the much of the ground surface had been disturbed/obscured by previous development.

As part of this study, Ninyo & Moore evaluated the referenced Clark County Soil Guidelines Map (Figure 4). This map indicates generalized near-surface soil considerations and geologic features. Review of the Clark County Soil Guidelines Map indicates that most of the project corridors are located primarily in an area mapped as *Standard Geotechnical Considerations Area (Mixed Alluvial Sand and Gravel)*. Areas north of I-215 and east of I-515 are mapped as a *Special Geotechnical Considerations Area (Solubility, Clay Swell, Corrosion, Gypsum Salt, Expansive or Hydro-collapsible Potential)*. Areas west of the northern and southern portions of I-515 are mapped in a *Special Geotechnical Considerations Area (Subsidence and 2,000-foot compaction or seismic fault buffer zone)*. These seismic fault buffer zones are associated with the previously mentioned compaction faults.

The Clark County Expansive Soil Guidelines Map (Figure 5) indicates general trends of near-surface soils in the Las Vegas Valley. This map shows areas where previous geotechnical studies have indicated the presence of moderately, highly, and critically expansive soils. Based on review of this map, the project corridors are located in areas with high expansive soil. The west portion of the I-215 alignment was mapped in a critical expansive soil area. However, it should be noted that based on Ninyo & Moore's previous experience in the project area, we anticipate scattered fine-grained soil layers with low to moderate expansive potential along the project corridor.

## **6 ANTICIPATED SUBSURFACE SOIL CONDITIONS**

Ninyo & Moore has performed numerous previous geotechnical evaluations in the vicinity of the project corridors. Information from selected projects was reviewed as part of our limited assessment. The locations of these projects are shown on Figure 6. Information reviewed included logs of exploratory borings drilled utilizing various methods to depths of up to approximately 100 feet. Based on findings from these previous studies, proposed project improvements are anticipated to be underlain generally by relatively shallow fill, uncemented and slightly cemented native soils, and layers of caliche. Generalized descriptions of soils encountered in the project area during our previous geotechnical evaluations are described in the following sections. Logs for these previous exploratory excavations are provided in the

Appendices. Similar soils and subsurface conditions should be anticipated along the project corridors.

## 6.1 Fill

Fill material encountered in previous exploratory excavations was relatively shallow and consisted primarily of engineered fill associated with existing roadways and improvements. In general, the fill was composed primarily of granular material with minor amounts of fine-grained soil. Deep fill will likely be encountered in areas of roadway embankments and in areas adjacent to washes.

Though not encountered in our borings, or during our site reconnaissance, Ninyo & Moore understands that the remnants of multiple “burn pits”, possibly associated with nearby industrial facilities, were previously located in the vacant area southwest of the I-215/I-515 interchange. Debris-laden fill associated with these former burn pits may be encountered during excavation activities in this area.

## 6.2 Native Soils

Review of boring logs from Ninyo & Moore’s subsurface explorations from previous geotechnical evaluations in the vicinity of the project corridors indicates that encountered native soils were comprised primarily of layers of granular (sandy and gravelly) soils with varying amounts of silt and clay, interbedded with relatively thinner fine-grained soil layers (clay and silt). Cobbles and small boulders were also encountered in previous exploratory borings, primarily in the central and southern portions of the I-515 corridor and the west and central portions of the I-215 corridor. Layers of fine-grained soils increase in thickness in the northern portions of I-515 corridor and the eastern portion of the I-215 corridor. Encountered coarse-grained soils were generally medium dense to very dense, and fine-grained soils were primarily stiff to very stiff.

Based on our review of encountered subsurface conditions and previous laboratory test results, we anticipate that native soils encountered along for the project corridors will contain varying amounts of gypsum, a naturally occurring mineral, which can be corrosive to concrete/ cementitious materials and has the potential to be water-soluble. Soils with elevated sulfate contents, which are considered to be deleterious to concrete, and relatively low resistivity, which are considered to be corrosive to metal, will also be encountered.

The southern portion of the I-515 corridor (south of the I-215 interchange) extends across an alluvial fan at the base of a mountain in the McCullough Range. In this area, the alluvial native soil is composed of coarse-grained material with cobbles and small boulders underlain by formational material (bedrock). The volcanic bedrock was previously mapped as Mount Davis

Volcanics, which is a miocene-age dacite and andesite, and is anticipated to be moderately hard to very hard. The nearest bedrock exposure is located about 1,000 feet west of I-515, but is anticipated to be relatively deep (greater than 50 feet) in the area of the I-515 corridor.

### 6.3 Cemented Soil (Caliche)

Cemented soil, locally known as caliche, is a naturally occurring cemented soil, which is prevalent in Las Vegas Valley, including the area of the project corridors. The cementation occurs when surface water, rich in carbonate minerals, infiltrates into the subsurface soils. The moisture subsequently dissipates/evaporates, depositing minerals between soil particles. This cycle of water infiltration, evaporation, and mineral buildup continues over long periods of time, creating naturally cemented soil layers of varying hardness and degrees of cementation. Cementation also occurs when carbonate minerals are present in the groundwater and migrate through soil pores via capillary action. The residual carbonate minerals deposited in the soil pores increases induration and densification of soil layers.

Hardness of caliche ranges from moderately hard to very hard, and the degree of cementation ranges from moderately cemented to strongly cemented. Some hard to very hard, strongly cemented caliche layers have been known to exhibit extreme hardness similar to high strength manufactured concrete. The following provides additional description of caliche typically encountered in southern Nevada.

- Generally occurs in layers a few inches to several feet thick.
- Layers typically vary significantly in thickness, degree of cementation, and hardness over relatively short distances and depths.
- Varies in composition from primarily fine-grained material to primarily coarse-grained material.
- Moderately hard, moderately cemented caliche can generally be gouged with a knife with difficulty and broken with a few hammer blows.
- Hard and very hard, strongly cemented caliche is difficult to scratch with a knife and breaks with difficulty with repeated hammer blows.
- In-place caliche samples are difficult to obtain utilizing conventional geotechnical drive sampling techniques. Cuttings of caliche samples are typically obtained for classification and possible chemical testing. Rock coring techniques to obtain in-place caliche samples can be considered.
- Impedes earthwork operations, including grading, shaft drilling, pile driving, and utility line trenching and tunneling. Rock excavation methods are generally needed.

Layers of cemented soil or caliche, were encountered in the majority of Ninyo & Moore's borings drilled during our previous geotechnical evaluations in the area of the project corridors. These

cemented layers were generally encountered at various depths and ranged from a few inches to over several feet thick. Caliche layers encountered in previous exploratory borings ranged from moderately hard to very hard and were moderately cemented to strongly cemented. Layers of slight cementation were also encountered.

## **7 ANTICIPATED GROUNDWATER CONDITIONS**

To evaluate anticipated groundwater conditions in the area of the project corridors, we reviewed previous Ninyo & Moore exploratory boring logs, the referenced State of Nevada Well Log Database, and the referenced Southern Nevada Water Authority groundwater map. The referenced map titled *Las Vegas Valley Depth to Shallow Groundwater Map* (SNWA, 2003) provides groundwater depth contour lines in the area of the project. These groundwater contour lines, which are shown on Figure 3, indicate groundwater depths on the order of 30 feet to more than 100 feet in the area of the project.

However, groundwater was encountered at shallow depths in some areas of the project. In particular, near Galleria Drive, stabilized groundwater was measured as shallow as 6.5 feet below the ground surface in a previous boring. In addition, shallow groundwater previously contributed to standing water that would accumulate in low-lying areas northeast of Galleria Drive and I-515 prior to the grade being raised and development of this area.

In general, the depth to groundwater is relatively deep (30 feet or more) along most of both project corridors, but becomes relatively shallow in the northern portion of the I-515 corridor. Groundwater depths change significantly with time and rapid fluctuations can occur, particularly near washes and depressed areas where water accumulates.

## **8 PRELIMINARY ENVIRONMENTAL REVIEW**

Ninyo & Moore conducted a preliminary review of environmental records consisting of a search for information regarding Corrective Actions on the Nevada Department of Environmental Protection's (NDEP's) website (eMap). A review of the Leaking Underground Storage Tank (LUST) and non-LUST cases indicated there are several facilities within 1.0-mile of the project corridors, including both open and closed cases of releases of total petroleum hydrocarbons (TPH), solvents, and metals, which mostly impacted soil. Based on the results of this preliminary review, contaminated soil and/or groundwater may be encountered during construction.

As previously mentioned, Ninyo & Moore understands that the remnants of multiple "burn pits", possibly associated with nearby industrial facilities, were previously located in the vacant area

southwest of the I-215/I-515 interchange. Debris-laden fill associated with these former burn pits may be encountered during excavation activities in this area.

## 9 FINDINGS AND CONCLUSIONS

Based on the findings of this study, it is Ninyo & Moore's opinion that development of the proposed project is feasible from a geotechnical and geological perspective. Subsequent phases of this project should include performance of exploratory borings to evaluate subsurface conditions in areas of proposed structures and improvements, laboratory testing of obtained subsurface soils and groundwater samples, installation of monitoring wells as appropriate, geotechnical analyses, and preparation of design-level geotechnical recommendations. It is our opinion that the following geotechnical, geological, groundwater, and construction considerations should be considered during planning and development of the project.

- **Anticipated Subsurface Soil:** Native soils along the project corridor will consist primarily of granular material (sandy and gravelly) with a few, relatively thin layers of fine-grained soil (clay and silt). The layers of fine-grained soil generally increase in thickness in the northern portion of I-515 corridor and the eastern portion of the I-215 corridor. Significant amounts of cobbles and small boulders will also likely be encountered, primarily along the southern portion of the I-515 corridor and along the western portion of the I-215 corridor, particularly in alluvial fan areas near the base of the McCullough Range.
- **Caliche:** Significant layers of cemented soil, or caliche, were encountered during previous geotechnical evaluations performed in the project area. Caliche layers will likely range from a few inches to several feet thick. Based on previous project experience, heavy ripping and rock excavation techniques should be anticipated. The presence of caliche layers may impede drilled shaft, trenching, and other excavations.
- **Oversize Materials:** Significant amounts of oversize material, including cobbles, boulders, and rocks or hard chunks greater than 3 to 4 inches in nominal diameter, will be generated during grading operations. It should be anticipated that some oversize material will also be generated during excavation of caliche.
- **Potential Burn Pit Debris:** Ninyo & Moore understands that the remnants of multiple "burn pits", may be located in the vacant area southwest of the I-215/I-515 interchange. Debris-laden fill associated with these former burn pits may be encountered during excavation activities in this area. If encountered, these materials will need to be removed and properly disposed.
- **Groundwater:** Review of referenced groundwater-related data and Ninyo & Moore's previous professional experience in the area indicate that the depth to static groundwater is relatively shallow (less than 5 feet in low-lying areas) in the northern portion of the I-515 corridor. Groundwater depths are generally deeper (30 feet or more) in the central and southern portions of the I-515 corridor and significantly deeper beneath the I-215 corridor.
- **Moisture-Sensitive Soils:** Numerous layers of moderately to highly gypsiferous soil will be present along the project corridors. These gypsiferous soils should be considered potentially water-soluble.

- **Corrosive Soils:** Based on Ninyo & Moore’s previous professional experience, soils with relatively high sulfate contents, relatively low resistivities, and other potentially corrosive characteristics will be encountered along the project corridors.
- **Geologic Faults and Ground Fissures:** Review of referenced published geologic maps and observations during our site reconnaissance indicate that the project corridors are not traversed by faults or ground fissures. Nearby “compaction” faults that extend generally parallel to and west of the I-515 corridor should not significantly affect design or construction of the project.
- **Foundation Systems:** Based on Ninyo & Moore’s previous professional experience in the project area and anticipated subsurface soil conditions, conventional spread footings and drilled shaft foundations will be appropriate for support for proposed structures and improvements.

Project-related considerations discussed in this report will need to be addressed during subsequent geotechnical evaluation performed for pre-design and final design for this project. Ninyo & Moore recommends that the additional geotechnical evaluation include performance of a geotechnical site reconnaissance, subsurface explorations, and laboratory testing. Findings, conclusions, and recommendations resulting from this additional geotechnical evaluation should be provided in geotechnical reports to be utilized for design and construction purposes.

## 10 LIMITATIONS

The geotechnical evaluation described in this report has been conducted in accordance with current engineering practice and the standard of care exercised by reputable geotechnical consultants performing similar tasks in this area. No other warranty, expressed or implied, is made regarding the professional opinions presented in this report. Variations may exist and conditions not described in this report may be encountered. Our opinions are primarily based on review of referenced information. If conditions different than those described in this report are encountered, our office should be notified and additional evaluation, if appropriate, will be provided upon request.

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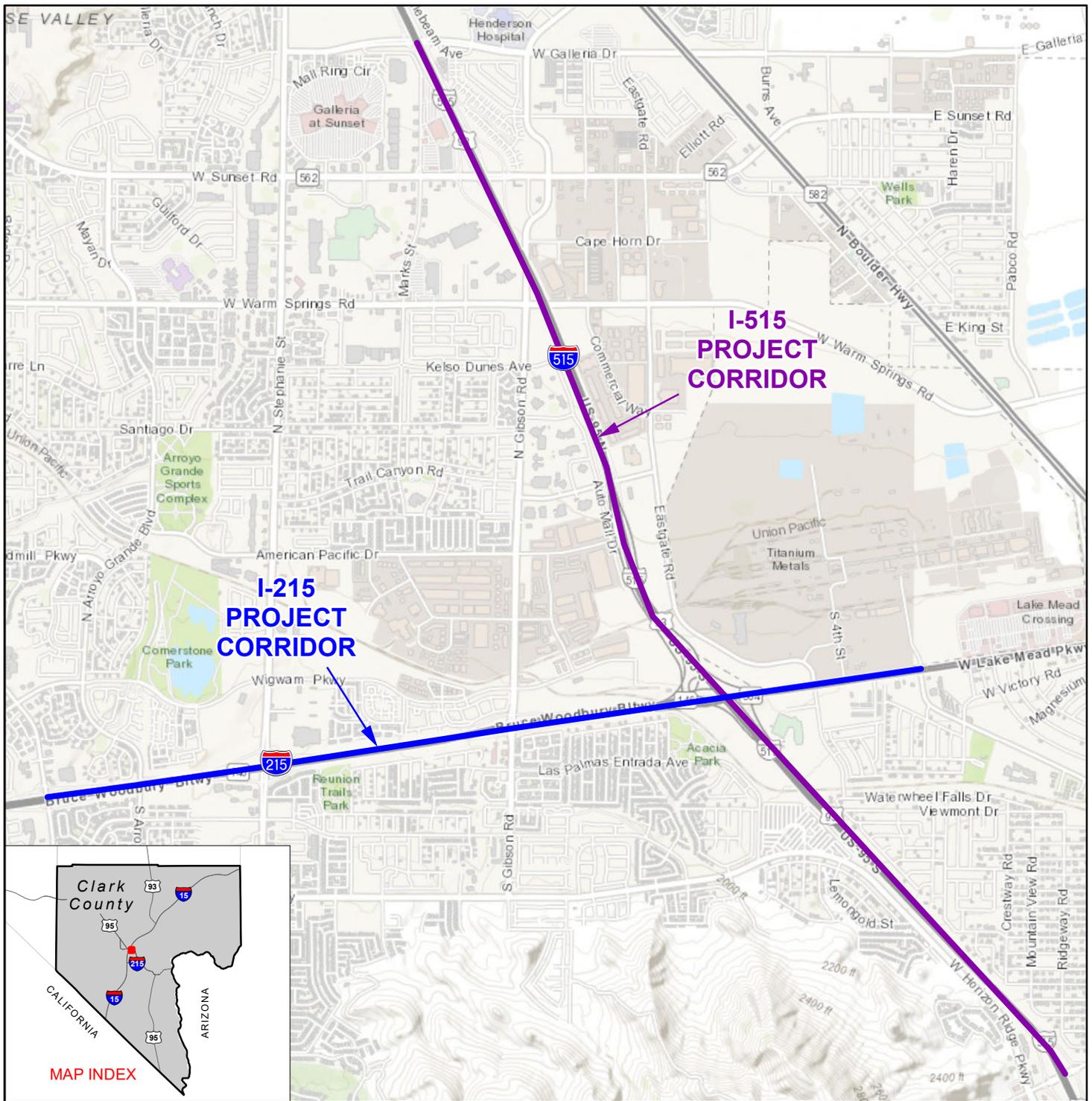
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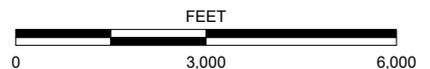


# FIGURES



1\_304433001\_SL\_515.mxd 3/27/2019\_JDL

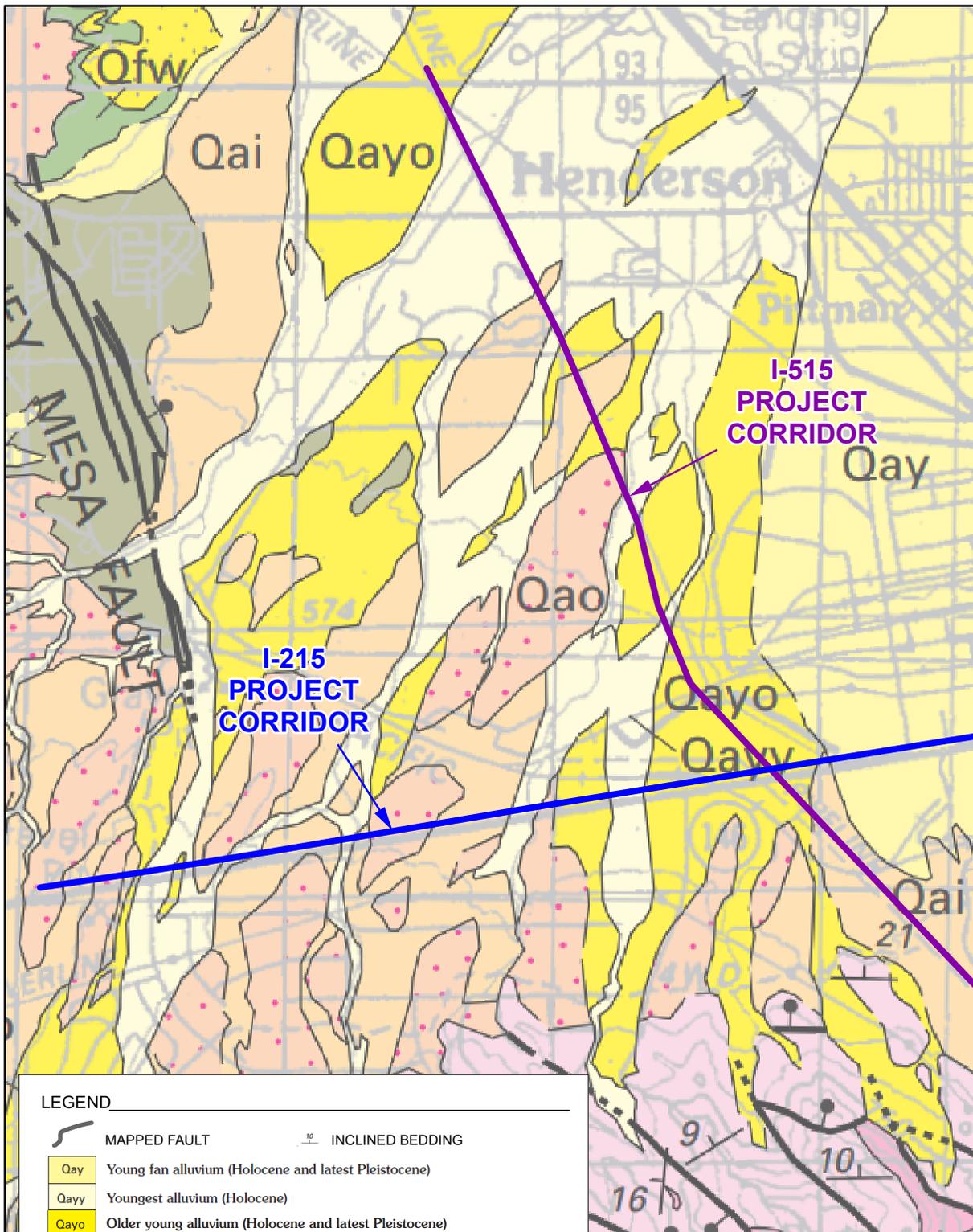
NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE. | SOURCE: ESRI WORLD TOPO, 2018



**FIGURE 1**

**ALIGNMENT LOCATIONS**

I-215 AND I-15 CORRIDOR IMPROVEMENTS  
HENDERSON, NEVADA

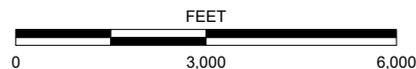


GEOLOGIC  
DATA  
NOT  
AVAILABLE

**LEGEND**

	MAPPED FAULT		INCLINED BEDDING
	Qay	Young fan alluvium (Holocene and latest Pleistocene)	
	Qayy	Youngest alluvium (Holocene)	
	Qayo	Older young alluvium (Holocene and latest Pleistocene)	
	Qai	Intermediate fan alluvium (late and middle? Pleistocene)	
	Qau	Undivided young and intermediate alluvium (Holocene and late Pleistocene)	
	Qd	Dune sand (late Holocene)	
	QTs	Undivided fine-grained sediments of the Las Vegas Valley (Quaternary and Tertiary?)	
	Tmd	Mount Davis Volcanics (Miocene)	

SOURCE: MATTI, J.C. AND BACHHUBER, F.W., 1985, LAS VEGAS SOUTHWEST QUADRANGLE GEOLOGIC MAP: NEVADA BUREAU OF MINES AND GEOLOGY, SCALE 1:24,000

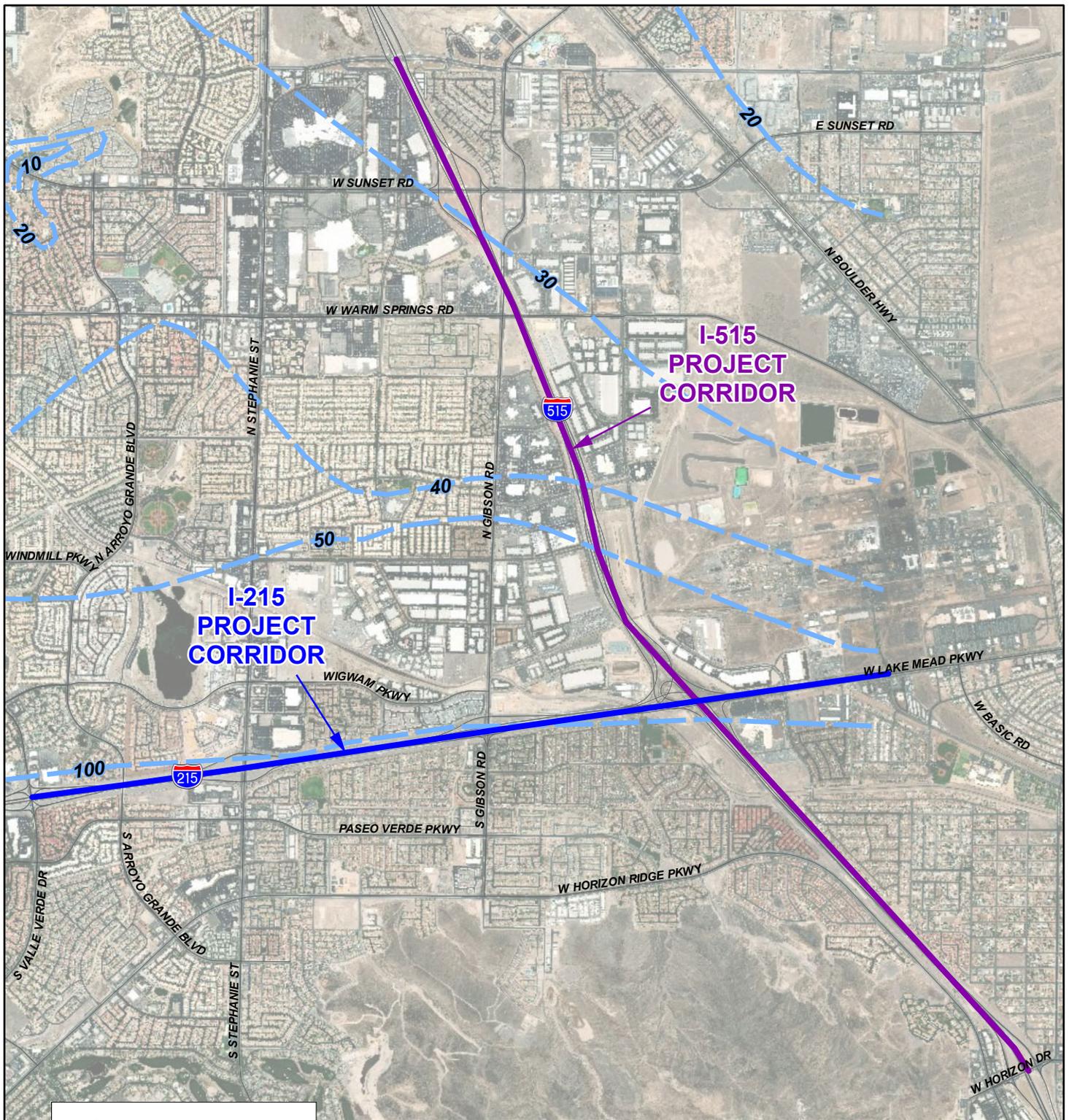


NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE.

**FIGURE 2**

**GEOLOGY**

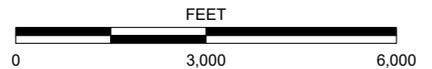
I-215 AND I-515 CORRIDOR IMPROVEMENTS  
HENDERSON, NEVADA



**LEGEND**

 **100** DEPTH TO WATER

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE. | SOURCES: SHALLOW GW (DEPTH TO GW) - SOUTHERN NEVADA WATER AUTHORITY SHALLOW GW MONITORING NETWORK DATABASE, 2003; ESRI WORLD IMAGERY, 2019

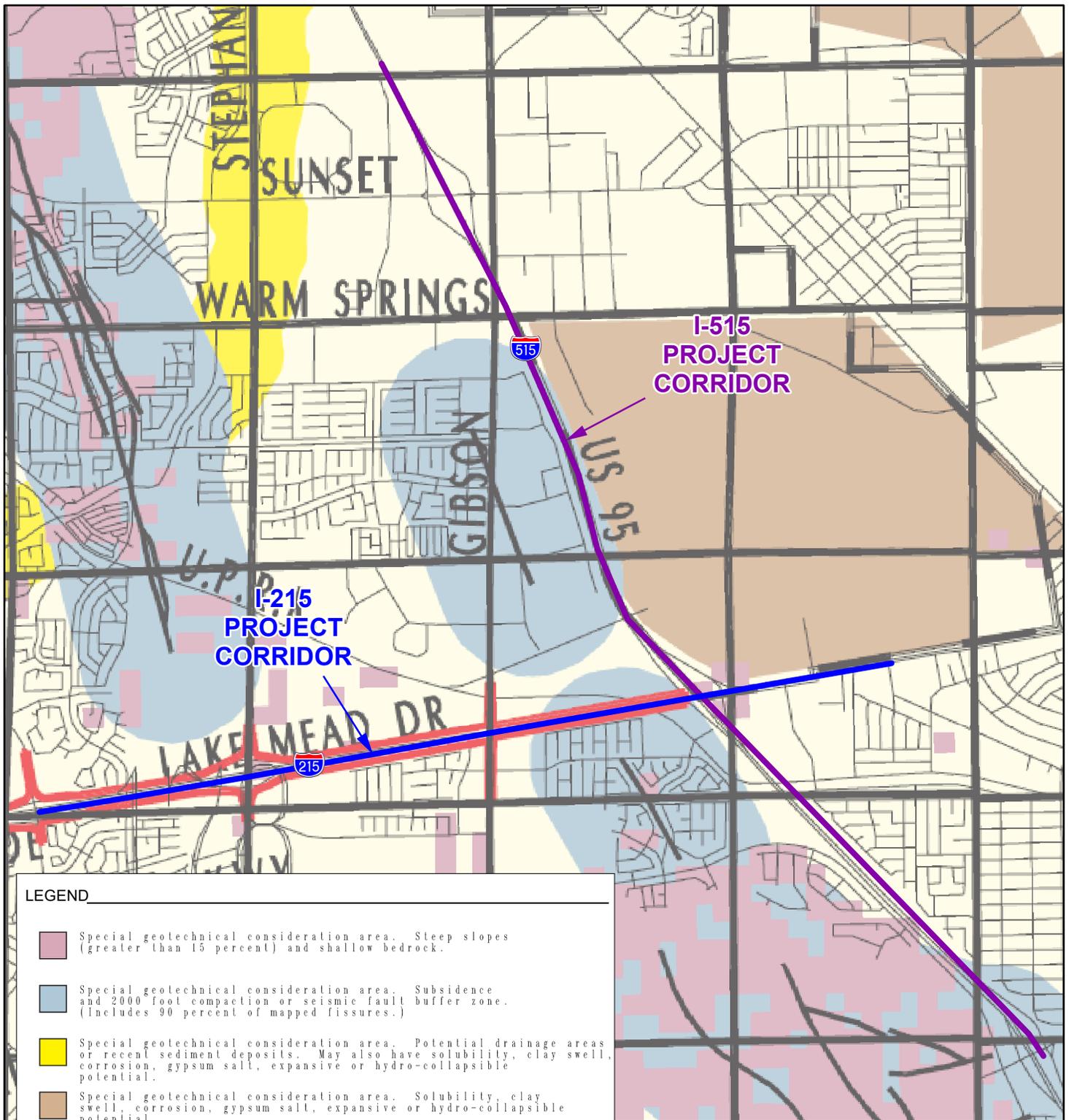


3\_304433001\_GW\_515.mxd 3/28/2019 JDL

**FIGURE 3**

**GROUNDWATER**

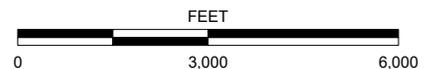
I-215 AND I-515 CORRIDOR IMPROVEMENTS  
HENDERSON, NEVADA



**LEGEND**

- Special geotechnical consideration area. Steep slopes (greater than 15 percent) and shallow bedrock.
- Special geotechnical consideration area. Subsidence and 2000 foot compaction or seismic fault buffer zone. (Includes 90 percent of mapped fissures.)
- Special geotechnical consideration area. Potential drainage areas or recent sediment deposits. May also have solubility, clay swell, corrosion, gypsum salt, expansive or hydro-collapsible potential.
- Special geotechnical consideration area. Solubility, clay swell, corrosion, gypsum salt, expansive or hydro-collapsible potential.
- Standard geotechnical consideration area. Mixed alluvial sand and gravel.
- N Faults, Inferred Faults, Concealed Faults

REFERENCE: COMPILED BY THE CLARK COUNTY BUILDING DEPARTMENT PERSONNEL, THE NEVADA BUREAU OF MINES AND GEOLOGY, AND CREATED BY THE CLARK COUNTY BUILDING DEPARTMENT USING THE FOLLOWING REFERENCES: LAS VEGAS SUBSIDENCE REPORT COMPILED BY THE NEVADA BUREAU OF MINES AND GEOLOGY . JUNE 1991 USGS AND REGIONAL FLOOD CONTROL DISTRICT REFERENCES



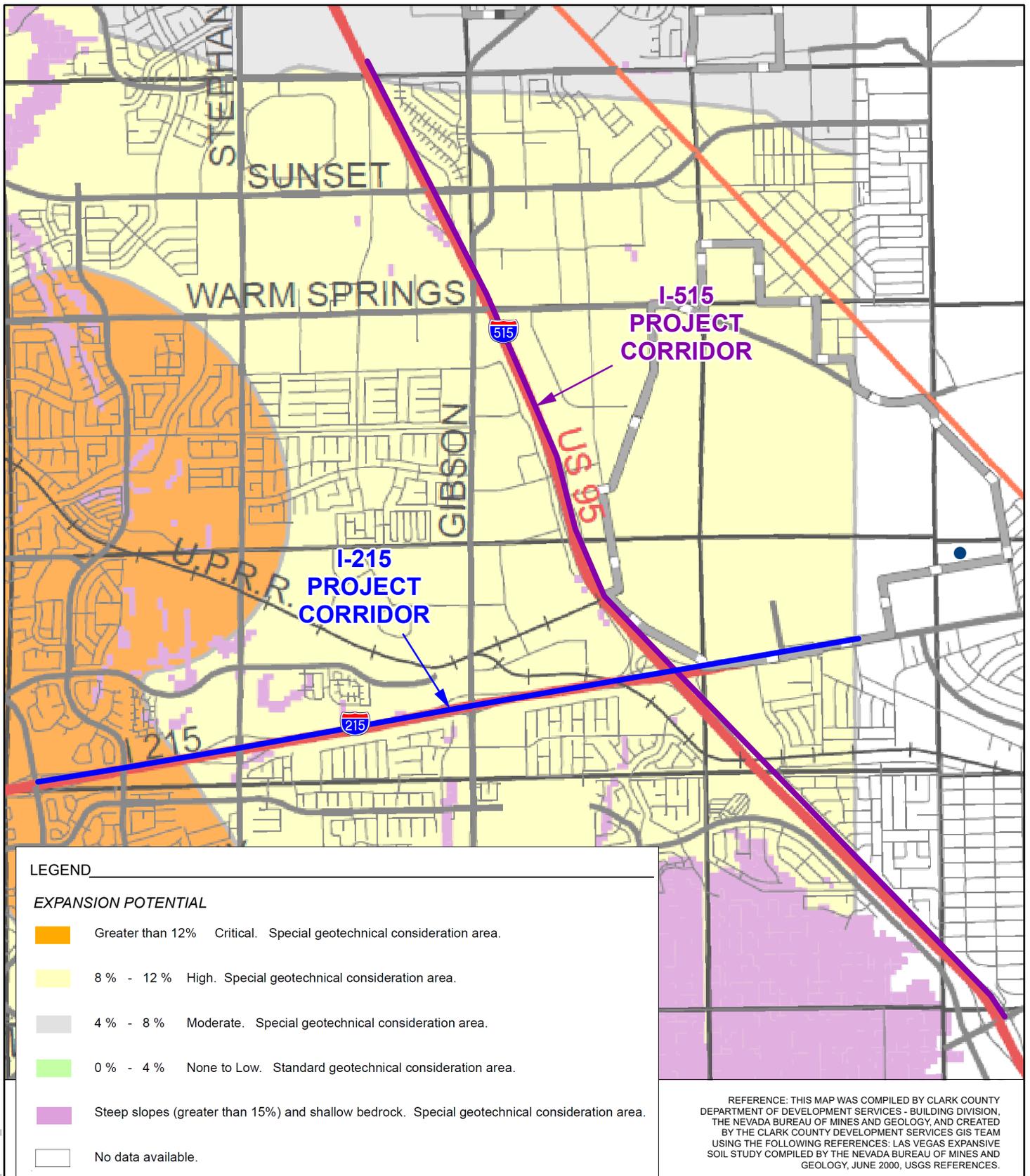
NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE.

4\_304433001\_SG\_515.mxd 3/28/2019 JDL

**FIGURE 4**

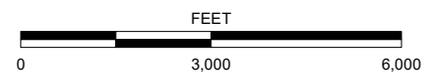
**CLARK COUNTY SOIL GUIDELINES**

I-215 AND I-515 CORRIDOR IMPROVEMENTS  
HENDERSON, NEVADA



5\_304433001\_EXPSG\_515.mxd 3/28/2019 JDL

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE.



**FIGURE 5**

**CLARK COUNTY EXPANSIVE SOIL GUIDELINES**

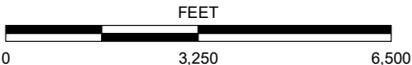
I-215 AND I-515 CORRIDOR IMPROVEMENTS  
HENDERSON, NEVADA



**LEGEND**

**APPENDIX G (B-3)**  
 PREVIOUS BORING

**APPENDIX H**  
 REFER TO APPENDIX FOR BORING LOGS



NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE. | SOURCE: ESRI WORLD TOPO, 2019

**FIGURE 6**

**PREVIOUS EXPLORATORY EXCAVATIONS**

I-215 AND I-515 CORRIDOR IMPROVEMENTS  
 HENDERSON, NEVADA



FIGURE 7

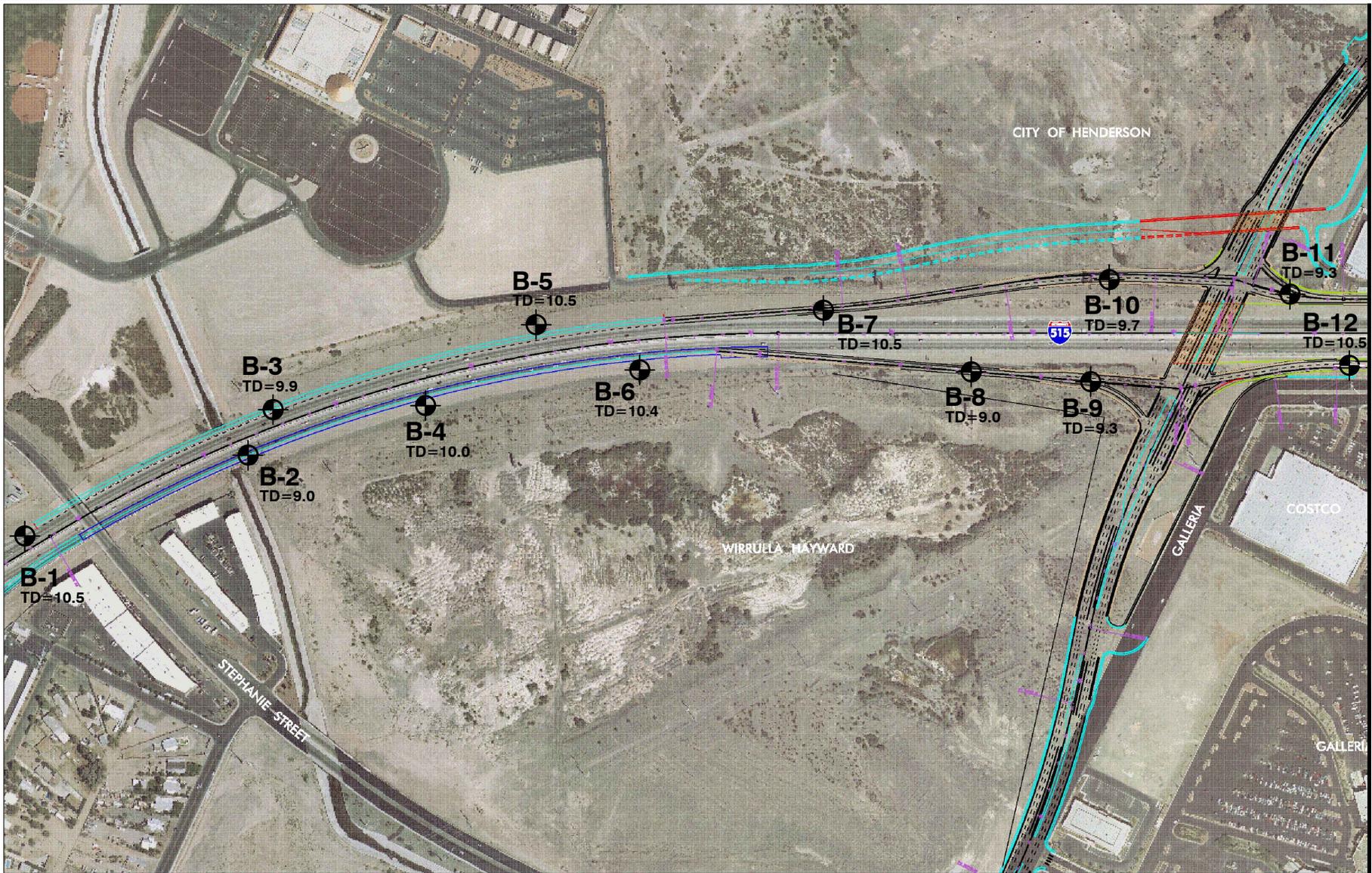
**AERIAL PHOTOGRAPH**

I-215 and I-515 CORRIDOR IMPROVEMENTS  
HENDERSON, NEVADA



# APPENDIX A

## I-515 and Galleria Drive

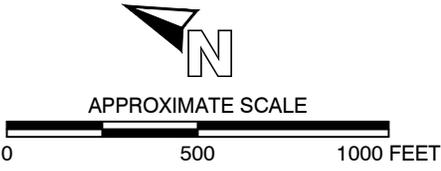


MATCHLINE (See Figure 3)

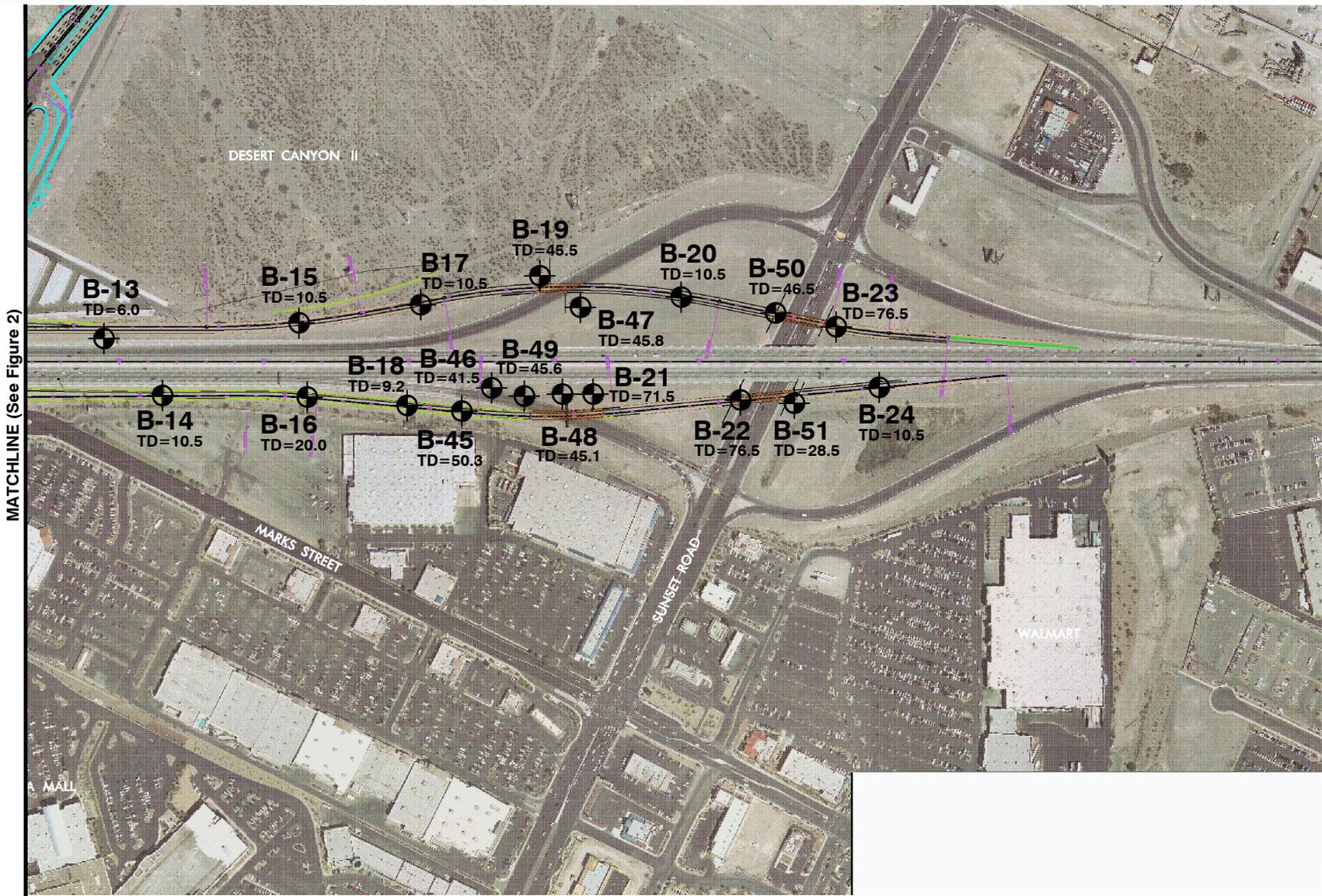
**LEGEND**


**B-36** Approximate location of exploratory boring.  
 TD=10.5 TD indicates total depth of exploratory boring, in feet.

NOTE: Dimensions, directions, and locations are approximate.



<b><i>Ninyo &amp; Moore</i></b>		<b>BORING LOCATION MAP</b>	FIGURE
PROJECT NO.	DATE	GALLERIA DRIVE INTERCHANGE INTERSTATE 515 AND GALLERIA DRIVE HENDERSON, NEVADA	<b>2</b>
301458002	05/07		



**LEGEND**

**B-36** Approximate location of exploratory boring.  
 TD=10.5 TD indicates total depth of exploratory boring, in feet.

NOTE: Dimensions, directions, and locations are approximate.



APPROXIMATE SCALE



**Ninyo & Moore**

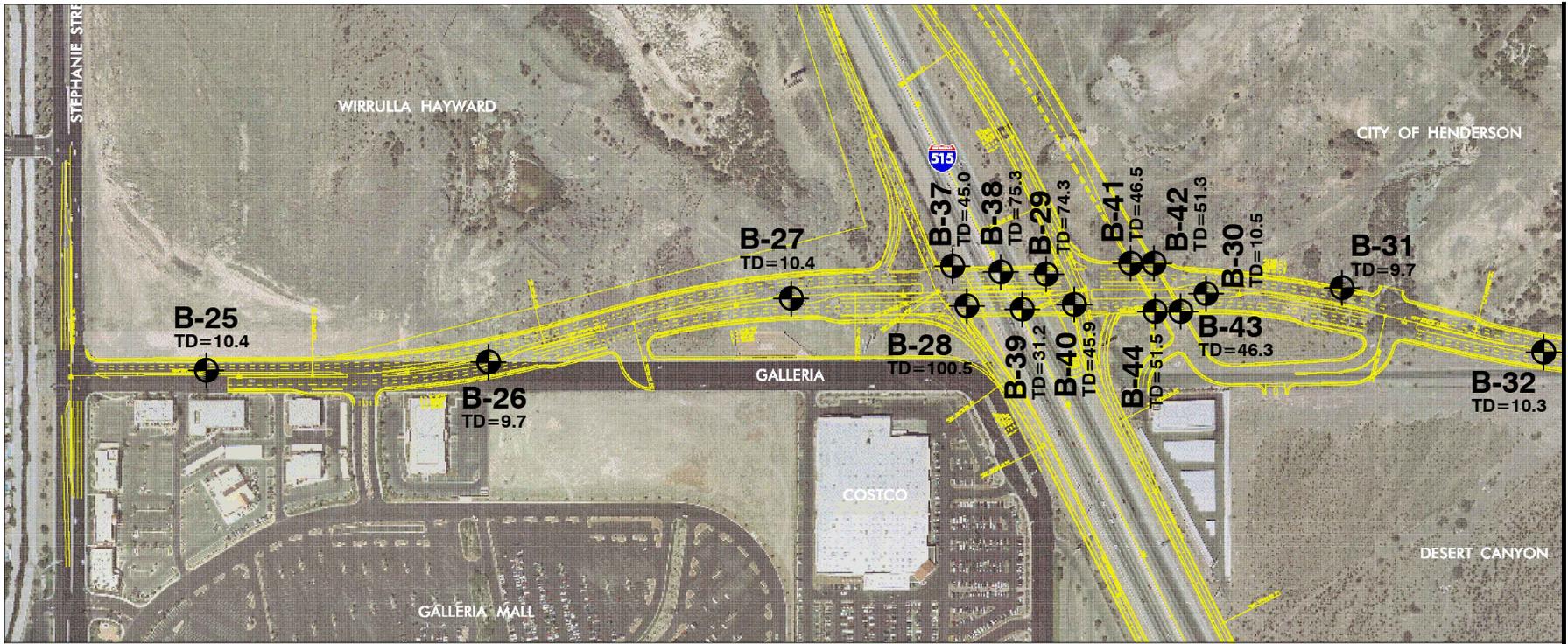
PROJECT NO.	DATE
301458002	05/07

**BORING LOCATION MAP**

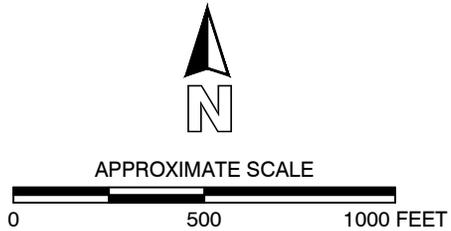
GALLERIA DRIVE INTERCHANGE  
 INTERSTATE 515 AND GALLERIA DRIVE  
 HENDERSON, NEVADA

FIGURE

**3**



MATCHLINE (See Figure 5)

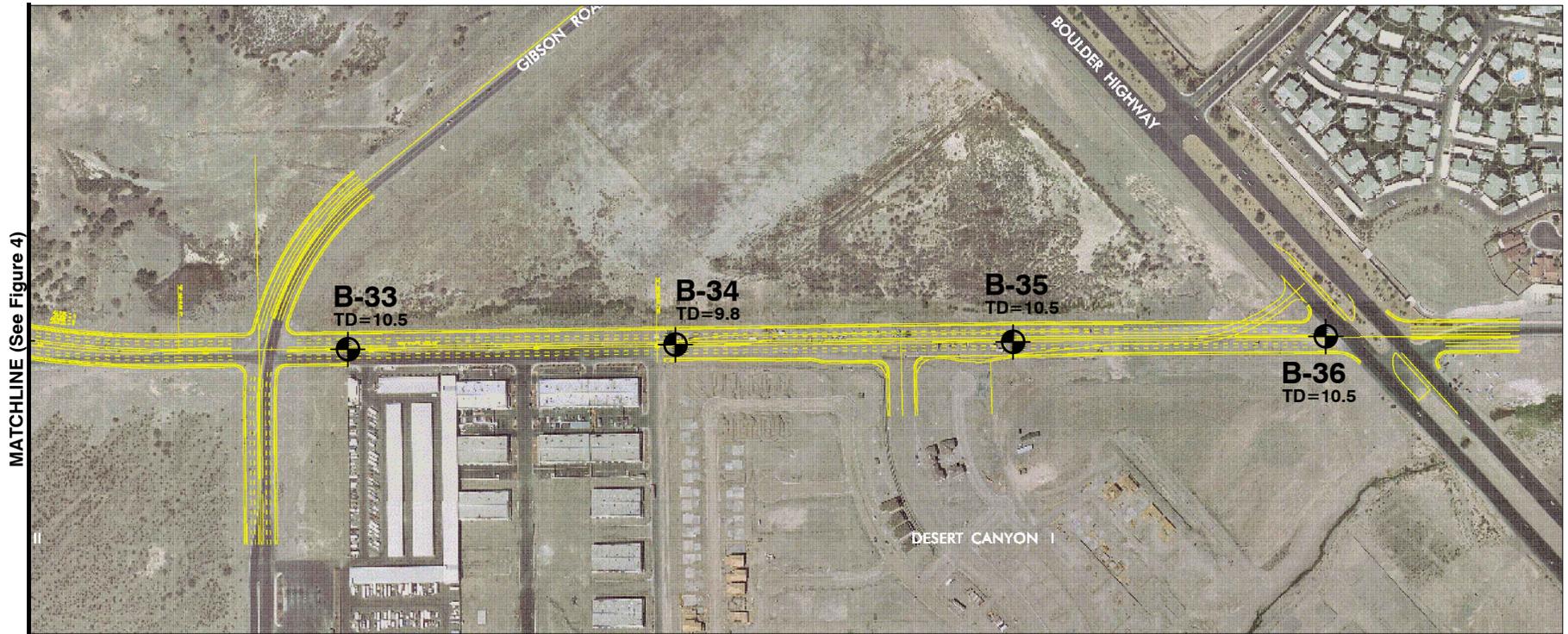


NOTE: Dimensions, directions, and locations are approximate.

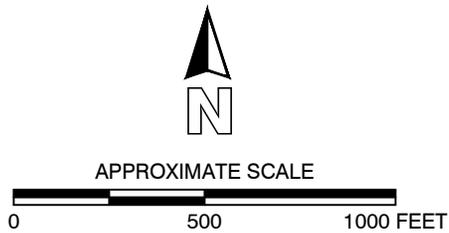
**LEGEND**

**B-36** TD=10.5 Approximate location of exploratory boring.  
 TD indicates total depth of exploratory boring, in feet.

		<b>BORING LOCATION MAP</b>  GALLERIA DRIVE INTERCHANGE INTERSTATE 515 AND GALLERIA DRIVE HENDERSON, NEVADA	FIGURE
			<b>4</b>
PROJECT NO.	DATE		
301458002	05/07		



MATCHLINE (See Figure 4)



**LEGEND**

 **B-36**  
 TD=10.5    Approximate location of exploratory boring.  
 TD indicates total depth of exploratory boring, in feet.

NOTE: Dimensions, directions, and locations are approximate.

<b><i>Ninyo &amp; Moore</i></b>		<b>BORING LOCATION MAP</b>	FIGURE  <b>5</b>
PROJECT NO.	DATE	GALLERIA DRIVE INTERCHANGE INTERSTATE 515 AND GALLERIA DRIVE HENDERSON, NEVADA	
301458002	05/07		

# BORING LOG EXPLANATION SHEET

DEPTH (feet)	Bulk Samples Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.
0	■					Bulk sample.
	■					Modified split-barrel drive sampler.
	■					No recovery with modified split-barrel drive sampler.
	■					Sample retained by others.
	■					Standard Penetration Test (SPT).
5	■					No recovery with a SPT.
	■	XX/XX				Shelby tube sample. Distance pushed in inches/length of sample recovered in inches.
	■					No recovery with Shelby tube sampler.
	■					Continuous Push Sample.
	■		○			Seepage.
10	■		○			Groundwater encountered during drilling.
	■		○			Groundwater measured after drilling.
	■				■	SM
	■				---	ALLUVIUM: Solid line denotes unit change. Dashed line denotes material change.
15						Attitudes: Strike/Dip b: Bedding c: Contact j: Joint f: Fracture F: Fault cs: Clay Seam s: Shear bss: Basal Slide Surface sf: Shear Fracture sz: Shear Zone sbs: Sheared Bedding Surface
20						The total depth line is a solid line that is drawn at the bottom of the boring.



## BORING LOG

### EXPLANATION OF BORING LOG SYMBOLS

PROJECT NO.

DATE  
Rev. 01/03

FIGURE

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.				
	Bulk	Driven						03/09/06	B-1				
								GROUND ELEVATION	SHEET	OF			
								METHOD OF DRILLING	CME 75 8-inch hollow-stem auger drill rig	1	1		
								DRIVE WEIGHT	140 lbs. (auto trip hammer)	DROP	30"		
								SAMPLED BY	RCH	LOGGED BY	RCH	REVIEWED BY	EDE
								<b>DESCRIPTION/INTERPRETATION</b>					
0							GM	<b>FILL:</b> Brown, damp, medium dense, silty GRAVEL with sand.					
			24	10.8	105.9		SC	Brown, damp, medium dense, clayey SAND.					
			17	9.1			SC	<b>ALLUVIUM:</b> Light brown, medium dense, clayey SAND with gravel; highly gypsiferous.					
5							CL	Brown, saturated, stiff, sandy lean CLAY.  Slightly cemented.  Very stiff.					
10			18	-	-			Total depth = 10.5 feet. Seepage encountered at approximately 6.5 feet during drilling. Water measured at approximately 6.8 feet approximately 48 hours after drilling.  Note: Boring location approximately 90 feet east of NDOT Station No. 802+36. Backfilled on 03/11/06.					
15													
20													



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
301458002

DATE  
10/06

FIGURE  
A-1

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/08/06</u> BORING NO. <u>B-2</u>		
	Bulk	Driven						GROUND ELEVATION <u>1,672.15'± MSL</u>	SHEET <u>1</u> OF <u>1</u>	METHOD OF DRILLING <u>CME 75 8-inch hollow-stem auger drill rig</u>
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u>	LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>
<b>DESCRIPTION/INTERPRETATION</b>										
0							GM	<u>FILL:</u> Brown, damp, loose, silty GRAVEL with sand.		
			16	3.1	104.0		SM	<u>ALLUVIUM:</u> Light brown, damp, medium dense, silty SAND with gravel; highly gypsiferous.		
			45	2.4			GM	Brown, damp, dense, silty GRAVEL with sand and cobbles; highly gypsiferous.		
5								Light brown, damp, hard, CALICHE; strongly cemented; composed primarily of fine-grained material.		
			25/0"					Total depth = 9.0 feet. Groundwater not encountered during drilling. Backfilled on 03/08/06.		
10								Note: Boring location approximately 80 feet west of NDOT Station No. 792+40.		
15										
20										



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.	DATE	FIGURE
301458002	10/06	A-2

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/09/06</u> BORING NO. <u>B-3</u>		
	Bulk	Driven						GROUND ELEVATION <u>1,674± MSL</u>	SHEET <u>1</u> OF <u>1</u>	METHOD OF DRILLING <u>CME 75 8-inch hollow-stem auger drill rig</u>
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>	SAMPLED BY <u>RCH</u> LOGGED BY <u>RCH</u> REVIEWED BY <u>EDE</u>
								<b>DESCRIPTION/INTERPRETATION</b>		
0							GM	<u>FILL:</u> Brown, damp, dense, silty GRAVEL with sand.		
				5.0			SM	<u>ALLUVIUM:</u> Light brown, dry to damp, medium dense, silty SAND with gravel and cobbles; highly gypsiferous.		
			34							
5			38	3.1						
							GM	Light brown, damp, very dense, silty GRAVEL with sand; slightly cemented; highly gypsiferous.		
							GP-GM	Brown, damp, very dense, poorly graded GRAVEL with silt, sand, and cobbles. Sampler refusal after 11 inches.		
10			50/5"					Total depth = 9.9 feet. Groundwater not encountered during drilling. Backfilled on 03/09/06.		
								Note: Boring location approximately 85 feet east of NDOT Station No. 791+45.		
15										
20										



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO. 301458002	DATE 10/06	FIGURE A-3
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DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/08/06</u> BORING NO. <u>B-4</u>	
	Bulk	Driven						GROUND ELEVATION <u>1,675.43'± MSL</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>CME 75 8-inch hollow-stem auger drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u> DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u> LOGGED BY <u>RCH</u> REVIEWED BY <u>EDE</u>	
<b>DESCRIPTION/INTERPRETATION</b>									
0							GM	<u>FILL:</u> Brown, damp, dense, silty GRAVEL with sand and cobbles.	
			26	2.6					Sampler refusal after 12 inches.
			40	3.4	105.3		GP-GM	<u>ALLUVIUM:</u> Brown, damp, medium dense, poorly graded GRAVEL with silt, sand, and cobbles; highly gypsiferous.	
5									
			50/6"	4.7			SP-SM	Brown, damp, very dense, poorly graded SAND; few gravel. Sampler refusal after 12 inches.	
10									
									Total depth = 10.0 feet. Groundwater not encountered during drilling. Backfilled on 03/08/06.
									Note: Boring location approximately 70 feet west of NDOT Station No. 788+38.
15									
20									



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO. 301458002	DATE 10/06	FIGURE A-4
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DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/09/06</u> BORING NO. <u>B-5</u>		
	Bulk	Driven						GROUND ELEVATION <u>1,676.15'± MSL</u>	SHEET <u>1</u> OF <u>1</u>	METHOD OF DRILLING <u>CME 75 8-inch hollow-stem auger drill rig</u>
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u>	LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>
								<b>DESCRIPTION/INTERPRETATION</b>		
0							SP	<b>FILL:</b> Brown, dry to damp, medium dense, poorly graded SAND with gravel and cobbles.		
			16	3.7			SP-SM	<b>ALLUVIUM:</b> Brown, damp, medium dense, poorly graded SAND with silt and gravel.  Increase in gravel content.		
			18	5.1	108.9		GP-GM	Brown, damp, medium dense, poorly graded GRAVEL with silt, sand, and cobbles.		
5										
			55	2.7				Very dense.		
10								Total depth = 10.5 feet. Groundwater not encountered during drilling. Backfilled on 03/09/06.		
								Note: Boring location approximately 80 feet east of NDOT Station No. 782+38.		
15										
20										



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO. 301458002	DATE 10/06	FIGURE A-5
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DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/08/06</u> BORING NO. <u>B-6</u>		
	Bulk	Driven						GROUND ELEVATION <u>1,683± MSL</u>	SHEET <u>1</u> OF <u>1</u>	METHOD OF DRILLING <u>CME 75 8-inch hollow-stem auger drill rig</u>
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>	SAMPLED BY <u>RCH</u> LOGGED BY <u>RCH</u> REVIEWED BY <u>EDE</u>
								<b>DESCRIPTION/INTERPRETATION</b>		
0			93/11"	3.0	126.3		GP-GM	<u>FILL:</u> Brown to light brown, damp, very dense, poorly graded GRAVEL with silt and sand.  Sampler refusal after 17 inches.		
							GW-GM	<u>ALLUVIUM:</u> Brown, damp, very dense, well-graded GRAVEL with silt, sand, and cobbles.		
			100/9"	3.5			GP-GM	Brown, damp, very dense, poorly graded GRAVEL with silt, sand, and cobbles.  Sampler refusal after 15 inches.		
5										
			98/11"	4.3	124.1			Sampler refusal after 17 inches.		
10								Total depth = 10.4 feet. Groundwater not encountered during drilling. Backfilled on 03/08/06.		
								Note: Boring location approximately 75 feet west of NDOT Station No. 778+20.		
15										
20										



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
301458002

DATE  
10/06

FIGURE  
A-6

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.	
	Bulk	Driven						03/09/06	B-7	
								GROUND ELEVATION	SHEET	OF
								METHOD OF DRILLING		
								DRIVE WEIGHT	DROP	
								SAMPLED BY	LOGGED BY	REVIEWED BY
								<b>DESCRIPTION/INTERPRETATION</b>		
0							GM	<u>FILL:</u> Brown, damp, very dense, silty GRAVEL with sand, cobbles, and boulders.		
			50/3"	--	--		GP-GM	<u>ALLUVIUM:</u> Brown, damp, very dense, poorly graded GRAVEL with silt, sand, cobbles, and boulders. Sampler refusal after 9 inches.		
			50/5"					Sampler refusal after 9 inches.		
5							SP-SM	Brown, damp, very dense, poorly graded SAND with silt.		
							GP-GM	Brown, damp, very dense, poorly graded GRAVEL with silt, sand, and cobbles.		
10			77	4.6				Total depth = 10.5 feet. Groundwater not encountered during drilling. Backfilled on 03/09/06.		
								Note: Boring location approximately 80 feet east of NDOT Station No. 772+95.		
15										
20										

**Ninyo & Moore**

**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
301458002

DATE  
10/06

FIGURE  
A-7

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.				
	Bulk	Driven						03/08/06	B-8				
								GROUND ELEVATION	SHEET	OF			
								1,685± MSL	1	1			
								METHOD OF DRILLING	CME 75 8-inch hollow-stem auger drill rig				
								DRIVE WEIGHT	140 lbs. (auto trip hammer)	DROP	30"		
								SAMPLED BY	RCH	LOGGED BY	RCH	REVIEWED BY	EDE
								<b>DESCRIPTION/INTERPRETATION</b>					
0							GM	<u>FILL:</u> Light brown to brown, damp, medium dense, silty GRAVEL with sand and cobbles.					
29							GP-GM	<u>ALLUVIUM:</u> Brown, damp, dense, poorly graded GRAVEL with silt, sand, and cobbles.					
50/5"								Very dense; sampler refusal after 5 inches.					
5								Light brown, damp, very hard, CALICHE; strongly cemented; composed primarily of coarse-grained material.					
50/<1"								Sampler refusal. Total depth = 9.0 feet. Groundwater not encountered during drilling. Backfilled on 03/08/06.					
10								Note: Boring location approximately 85 feet west of NDOT Station No. 769+12.					
15													
20													



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
301458002

DATE  
10/06

FIGURE  
A-8

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/07/06</u> BORING NO. <u>B-9</u>		
	Bulk	Driven						GROUND ELEVATION <u>1,685± MSL</u>	SHEET <u>1</u> OF <u>1</u>	METHOD OF DRILLING <u>CME 75 8-inch hollow-stem auger drill rig</u>
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u>	LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>
<b>DESCRIPTION/INTERPRETATION</b>										
0							GP-GM	<u>FILL:</u> Brown, damp, medium dense, poorly graded GRAVEL with silt and sand.		
			37	6.6	114.2		SM	Brown, damp, medium dense, silty SAND with gravel.		
							GP-GM	<u>ALLUVIUM:</u> Brown, damp, medium dense, poorly graded GRAVEL with silt and sand.		
5			16	2.6			SP-SM	Brown, damp, medium dense, poorly graded SAND with silt and gravel.		
							GP-GM	Brown, damp, very dense, poorly graded GRAVEL with silt and sand.		
			50/3"					Sampler refusal after 3 inches. Total depth = 9.3 feet. Groundwater not encountered during drilling. Backfilled on 03/07/06.		
10								Note: Boring location approximately 120 feet west of NDOT Station No. 763+85.		
15										
20										



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
301458002

DATE  
10/06

FIGURE  
A-9

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.	
	Bulk	Driven						03/09/06	B-10	
								GROUND ELEVATION	SHEET	OF
								METHOD OF DRILLING		
								DRIVE WEIGHT	DROP	
								SAMPLED BY	LOGGED BY	REVIEWED BY
								<b>DESCRIPTION/INTERPRETATION</b>		
0			50/4"	3.1	108.1		GM	<b>FILL:</b> Brown, dry to damp, very dense, silty GRAVEL with sand, cobbles, and boulders.		
							GP-GM	<b>ALLUVIUM:</b> Brown, damp, very dense, poorly graded GRAVEL with silt, sand, cobbles, and boulders. Sampler refusal after 10 inches.		
5			40	4.1						
			50/2"				SP	Brown, saturated, very dense, poorly graded SAND with gravel. Sampler refusal after 8 inches. Boring terminated in moderately hard, moderately cemented layer. Total depth = 9.7 feet. Groundwater encountered at approximately 9.0 feet during drilling. Hole caved to approximately 6.0 feet approximately 48 hours after drilling. Backfilled on 03/11/06.		
10								Note: Boring location approximately 130 feet east of NDOT Station No. 763+33.		
15										
20										



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.	DATE	FIGURE
301458002	10/06	A-10

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/08/06</u> BORING NO. <u>B-11</u> GROUND ELEVATION <u>1,698.93'± MSL</u> SHEET <u>1</u> OF <u>1</u> METHOD OF DRILLING <u>CME 75 8-inch hollow-stem auger drill rig</u> DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u> DROP <u>30"</u> SAMPLED BY <u>RCH</u> LOGGED BY <u>RCH</u> REVIEWED BY <u>EDE</u>		
	Bulk	Driven						DESCRIPTION/INTERPRETATION		
0							GM	<u>FILL:</u> Brown, damp, dense, silty GRAVEL with sand.		
			28	10.0	106.2		SM	<u>ALLUVIUM:</u> Brown, damp, medium dense, silty SAND with gravel.		
			50/4"				GP-GM	Brown, damp, very dense, poorly graded GRAVEL with silt, sand, and cobbles; a few moderately hard; moderately cemented layers up to a few inches thick. Sampler refusal after 10 inches.		
5				2.7				Sampler refusal after 4 inches. Total depth = 9.3 feet. Groundwater not encountered during drilling. Backfilled on 03/08/06.		
			50/4"					Note: Boring location approximately 130 feet east of NDOT Station No. 756+40.		
10										
15										
20										



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
 HENDERSON, NEVADA

PROJECT NO.	DATE	FIGURE
301458002	10/06	A-11

DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/09/06</u>	BORING NO. <u>B-12</u>	
	Driven						GROUND ELEVATION <u>1,702± MSL</u>	SHEET <u>1</u> OF <u>1</u>	
							METHOD OF DRILLING <u>CME 75 8-inch hollow-stem auger drill rig</u>		
							DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>	
							SAMPLED BY <u>RCH</u>	LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>
<b>DESCRIPTION/INTERPRETATION</b>									

0	50/5"				GP-GM	<p><b>ALLUVIUM:</b> Brown, damp, loose, poorly graded GRAVEL with silt, sand, cobbles, and boulders. Very dense; sampler refusal after 11 inches.</p>
5	93/10"	3.0				<p>Sampler refusal after 16 inches.</p>
10	30	32.8	90.8		SC	<p>Brown, damp to moist, medium dense, clayey SAND with gravel; slightly gypsiferous.</p>
15						<p>Total depth = 10.5 feet. Groundwater not encountered during drilling. Backfilled on 03/09/06.</p>
20						<p>Note: Boring location approximately 115 feet west of NDOT Station No. 754+08.</p>



<b>BORING LOG</b>		
GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE HENDERSON, NEVADA		
PROJECT NO. 301458002	DATE 10/06	FIGURE A-12

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/08/06</u> BORING NO. <u>B-13</u>		
	Bulk	Driven						GROUND ELEVATION <u>1,710± MSL</u>	SHEET <u>1</u> OF <u>1</u>	METHOD OF DRILLING <u>CME 75 8-inch hollow-stem auger drill rig</u>
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>	SAMPLED BY <u>RCH</u> LOGGED BY <u>RCH</u> REVIEWED BY <u>EDE</u>
								<b>DESCRIPTION/INTERPRETATION</b>		
0							GM	<u>FILL:</u> Brown, damp, medium dense, silty GRAVEL with sand.		
			20	4.6			SP-SM	<u>ALLUVIUM:</u> Brown, damp, medium dense, poorly graded SAND with silt and gravel.		
5			24	4.4	110.7		GP-GM	Brown, damp, medium dense, poorly graded GRAVEL with silt, sand, cobbles and boulders.		
								Drill rig refusal on boulder. Total depth = 6.0 feet. Groundwater not encountered during drilling. Backfilled on 03/08/06.		
								Note: Boring location approximately 130 feet east of NDOT Station No. 750+85.		
10										
15										
20										



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO. 301458002	DATE 10/06	FIGURE A-13
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DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/09/06</u> BORING NO. <u>B-14</u>	
	Bulk	Driven						GROUND ELEVATION <u>1,707± MSL</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>CME 75 8-inch hollow-stem auger drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u> DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u> LOGGED BY <u>RCH</u> REVIEWED BY <u>EDE</u>	
<b>DESCRIPTION/INTERPRETATION</b>									
0			50/5"	3.9			SP-SM	<p><b>ALLUVIUM:</b> Brown, damp, medium dense, poorly graded SAND with silt and gravel. Very dense; sampler refusal after 11 inches.</p> <p>Increase in gravel content.</p>	
5			57	4.4	118.5		GP-GM	Brown, damp, dense, poorly graded GRAVEL with silt, sand, and cobbles.	
10			65	4.8			SP-SM	Brown, damp, very dense, poorly graded SAND with silt and gravel.	
15								<p>Total depth = 10.5 feet. Groundwater not encountered during drilling. Backfilled on 03/09/06.</p> <p>Note: Boring location approximately 130 feet west of NDOT Station No. 749+12.</p>	
20									



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
301458002

DATE  
10/06

FIGURE  
A-14

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/08/06</u> BORING NO. <u>B-15</u>	
	Bulk	Driven						GROUND ELEVATION <u>1,709± MSL</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>CME 75 8-inch hollow-stem auger drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u> DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u> LOGGED BY <u>RCH</u> REVIEWED BY <u>EDE</u>	
<b>DESCRIPTION/INTERPRETATION</b>									
0			53	3.1	123.8		GP-GM	<b>ALLUVIUM:</b> Brown, damp, loose, poorly graded GRAVEL with silt, sand, cobbles, and boulders. Dense.	
5			23				SM	Brown, damp, medium dense, silty SAND; few gravel.	
							GP-GM	Brown, damp, medium dense to dense, poorly graded GRAVEL with silt, sand, cobbles, and boulders.  Dense.	
10			63						
								Total depth = 10.5 feet. Groundwater not encountered during drilling. Backfilled on 03/08/06.	
								Note: Boring location approximately 155 feet east of NDOT Station No. 746+00.	
15									
20									



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
301458002

DATE  
10/06

FIGURE  
A-15

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/14/06</u> BORING NO. <u>B-16</u>		
	Bulk	Driven						GROUND ELEVATION <u>1,707.44± MSL</u>	SHEET <u>1</u> OF <u>2</u>	METHOD OF DRILLING <u>CME 75 8-inch hollow-stem auger drill rig</u>
								DRIVE WEIGHT <u>140 lbs. (spooling cable)</u>	DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u>	LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>
								<b>DESCRIPTION/INTERPRETATION</b>		
0			50/4"	1.0			GP-GM	<b>ALLUVIUM:</b> Brown, damp, very dense, poorly graded GRAVEL with silt, sand, cobbles, and boulders. Sampler refusal after 4 inches.		
				3.6			SM	Brown, damp, very dense, silty SAND with gravel, cobbles, and boulders.		
							GP-GM	Brown, damp, very dense, poorly graded GRAVEL with silt, sand, cobbles, and boulders.		
5			45	2.4			GM	Brown, damp, very dense, silty GRAVEL with silt, sand, and cobbles.		
10			50/5"	2.6			GP-GM	Brown, damp, very dense, poorly graded GRAVEL with silt, sand, and cobbles; slightly cemented. Sampler refusal after 5 inches.		
				3.4						
15			50/2"					Sampler refusal after 2 inches.		
				4.0			SP-SM	Brown, damp, very dense, poorly graded SAND with silt and gravel.		
							GP-GM	Brown, damp, very dense, poorly graded GRAVEL with silt, sand, and cobbles.		
20							SP-SM	Brown, saturated, dense, poorly graded GRAVEL with silt and gravel. Drill rig refusal.		



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
301458002

DATE  
10/06

FIGURE  
A-16

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/14/06</u>	BORING NO. <u>B-16</u>
	Bulk	Driven						GROUND ELEVATION <u>1,707.44± MSL</u>	SHEET <u>2</u> OF <u>2</u>
								METHOD OF DRILLING <u>CME 75 8-inch hollow-stem auger drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (spooling cable)</u>	DROP <u>30"</u>
								SAMPLED BY <u>RCH</u> LOGGED BY <u>RCH</u> REVIEWED BY <u>EDE</u>	
								<b>DESCRIPTION/INTERPRETATION</b>	

20	50/<1"							Total depth = 20.0 feet. Groundwater encountered at approximately 19.0 feet during drilling. Backfilled on 03/14/06.  Note: Boring location approximately 120 feet west of NDOT Station No. 744+30.	
25									
30									
35									
40									



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.	DATE	FIGURE
301458002	10/06	A-17

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.	
	Bulk	Driven						03/08/06	B-17	
								GROUND ELEVATION	SHEET	
								1,710± MSL	1 OF 1	
								METHOD OF DRILLING		
								CME 75 8-inch hollow-stem auger drill rig		
								DRIVE WEIGHT	DROP	
								140 lbs. (auto trip hammer)	30"	
								SAMPLED BY	LOGGED BY	REVIEWED BY
								RCH	RCH	EDE
<b>DESCRIPTION/INTERPRETATION</b>										
0							SW-SM	<u>ALLUVIUM:</u> Brown, damp, loose, well-graded SAND with silt and gravel. Medium dense to dense. Sampler refusal after 8 inches.		
			50/2"	4.0			GP-GM	Brown, damp, very dense, poorly graded GRAVEL with silt, sand, cobbles, and boulders.		
			50/2"					Sampler refusal after 2 inches.		
5										
10			77	6.1	113.2					
								Total depth = 10.5 feet. Groundwater not encountered during drilling. Backfilled on 03/08/06.		
								Note: Boring location approximately 240 feet east of NDOT Station No. 740+20.		
15										
20										



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.

DATE

FIGURE

301458002

10/06

A-18

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.				
	Bulk	Driven						03/14/06	B-18				
								GROUND ELEVATION	SHEET	OF			
								METHOD OF DRILLING	CME 75 8-inch hollow-stem auger drill rig				
								DRIVE WEIGHT	140 lbs. (spooling cable)	DROP	30"		
								SAMPLED BY	RCH	LOGGED BY	RCH	REVIEWED BY	EDE
								<b>DESCRIPTION/INTERPRETATION</b>					
0							GP-GM	<b>ALLUVIUM:</b> Brown, damp, very dense, poorly graded GRAVEL with silt, sand, cobbles, and boulders.					
			50/4"					Sampler refusal after 4 inches.					
5			50/<1"	2.5				Slightly cemented. Sampler refusal.					
			50/2"					Sampler refusal after 2 inches.					
10								Total depth = 9.2 feet. Groundwater not encountered during drilling. Backfilled on 03/14/06.					
15								Note: Boring location approximately 160 feet west of NDOT Station No. 740+65.					
20													



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.	DATE	FIGURE
301458002	10/06	A-19

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/08 and 03/16/06</u> BORING NO. <u>B-19</u>		
	Bulk	Driven						GROUND ELEVATION <u>1,710± MSL</u>	SHEET <u>1</u> OF <u>3</u>	METHOD OF DRILLING <u>CME 85 8-inch air-rotary drill rigs</u>
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u>	LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>
								<b>DESCRIPTION/INTERPRETATION</b>		
0							GM	<u>ALLUVIUM:</u> Brown, damp, medium dense, silty GRAVEL with sand, gravel, cobbles, and boulders.		
			35	1.2			SW-SM	Brown, damp, dense, well-graded SAND with silt, gravel, cobbles, and boulders.		
			50/5"				GP-GM	Brown, damp, dense, poorly graded GRAVEL with silt, sand, cobbles, and boulders. Very dense; sampler refusal after 5 inches.		
5								Sampler refusal after 3 inches.		
			50/3"							
10										
							SP-SM	Brown, damp, very dense, poorly graded SAND with silt and gravel.		
15			48	2.6						
							GP-GM	Brown, damp, very dense, poorly graded GRAVEL with silt, sand, and cobbles.		
			50/5"	5.5	84.7			Damp to moist; sampler refusal after 5 inches.		
20										



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.	DATE	FIGURE
301458002	10/06	A-20

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/08 and 03/16/06</u>	BORING NO. <u>B-19</u>	
	Bulk	Driven						GROUND ELEVATION <u>1,710± MSL</u>	SHEET <u>2</u> OF <u>3</u>	
								METHOD OF DRILLING <u>CME 85 8-inch air-rotary drill rigs</u>		
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u>	LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>
								<b>DESCRIPTION/INTERPRETATION</b>		

20							GP-GM	<p><b>ALLUVIUM (continued):</b> Brown, damp to moist, very dense, poorly graded GRAVEL with silt, sand, and cobbles; a few slightly cemented layers up to a few inches thick.</p> <p>Saturated.</p> <p>Sampler refusal after 4 inches.</p> <p>Sampler refusal after 2 inches.</p> <p>Sampler refusal after 3 inches.</p>
25								
30								
35								
40							SC	<p>Brown, saturated, very dense, clayey SAND.</p> <p>Sampler refusal after 11 inches.</p>



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.	DATE	FIGURE
301458002	10/06	A-21

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/08 and 03/16/06</u> BORING NO. <u>B-19</u>	
	Bulk	Driven						GROUND ELEVATION <u>1,710± MSL</u>	SHEET <u>3</u> OF <u>3</u>
								METHOD OF DRILLING <u>CME 85 8-inch air-rotary drill rigs</u>	
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u> DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u> LOGGED BY <u>RCH</u> REVIEWED BY <u>EDE</u>	
								<b>DESCRIPTION/INTERPRETATION</b>	
40							SC	ALLUVIUM (continued): Brown, saturated, very dense, clayey SAND.	
							CL	Brown, saturated, very stiff, lean CLAY.	
45			35	45.3				<p>Total depth = 45.5 feet.  Groundwater encountered at approximately 23.5 feet during drilling.  Groundwater measured at approximately 21.9 feet approximately 2 weeks after initial drilling.  Backfilled on 04/03/06.</p> <p>Note: Boring location approximately 350 feet east of NDOT Station No. 734+60.</p>	
50									
55									
60									



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
301458002

DATE  
10/06

FIGURE  
A-22

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/10/06</u> BORING NO. <u>B-20</u>		
	Bulk	Driven						GROUND ELEVATION <u>1,711± MSL</u>	SHEET <u>1</u> OF <u>1</u>	METHOD OF DRILLING <u>CME 75 8-inch hollow-stem auger drill rig</u>
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u>	LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>
<b>DESCRIPTION/INTERPRETATION</b>										
0							GP-GM	<u>FILL:</u> Brown, damp, medium dense, poorly graded GRAVEL with silt, sand, and cobbles.		
			42	3.4	117.9		GP-GM	<u>ALLUVIUM:</u> Brown, damp, dense, poorly graded GRAVEL with silt, sand, and cobbles.		
								Very dense; sampler refusal after 14 inches.		
5			63/8"	4.1						
							SP-SM	Brown, damp, very dense, poorly graded SAND with silt and gravel.		
10			83	3.4	120.8					
								Total depth = 10.5 feet. Groundwater not encountered during drilling. Backfilled on 03/10/06.		
								Note: Boring location approximately 100 feet west of NDOT Station No. 730+40.		
15										
20										



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
301458002

DATE  
10/06

FIGURE  
A-23



DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>04/05/06</u> BORING NO. <u>B-21</u>		
	Bulk	Driven						GROUND ELEVATION <u>1,725.8'± MSL</u>	SHEET <u>2</u> OF <u>4</u>	METHOD OF DRILLING <u>Mobile B-61 HDX 8-inch hollow-stem auger drill rig</u>
								DRIVE WEIGHT <u>140 lbs. (cathead)</u>	DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u>	LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>
								<b>DESCRIPTION/INTERPRETATION</b>		
20							GP-GC	<b>ALLUVIUM (continued):</b> Brown, damp, very dense, poorly graded GRAVEL with clay, silt, sand, cobbles, and boulders; a few hard; strongly cemented layers up to a few inches thick.		
25			50/4"	4.4	111.1			Sampler refusal after 10 inches.		
30			50/4"	5.0				Sampler refusal after 5 inches.		
35			42	45.0	83.4		SC	Brown, moist to wet, medium dense, clayey SAND; a few clay layers up to a few inches thick.		
								Light brown, saturated, moderately hard, CALICHE; moderately cemented; composed primarily of fine-grained material.		
							CL	Brown, saturated, very stiff, sandy lean CLAY; a few silty sand to clayey sand layers up to a few inches thick.		
40										



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO. 301458002	DATE 10/06	FIGURE A-25
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DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>04/05/06</u>	BORING NO. <u>B-21</u>
	Bulk	Driven						GROUND ELEVATION <u>1,725.8± MSL</u>	SHEET <u>3</u> OF <u>4</u>
METHOD OF DRILLING <u>Mobile B-61 HDX 8-inch hollow-stem auger drill rig</u>								DRIVE WEIGHT <u>140 lbs. (cathead)</u>	DROP <u>30"</u>
SAMPLED BY <u>RCH</u> LOGGED BY <u>RCH</u> REVIEWED BY <u>EDE</u>								<b>DESCRIPTION/INTERPRETATION</b>	

40		25	25.3			CL	<u>ALLUVIUM (continued):</u> Brown, saturated, very stiff, sandy lean CLAY; a few silty sand to clayey sand layers up to a few inches thick.
45		24	39.7	78.9			
50		27	27.2				
55		50/4"				SC	Brown, saturated, very dense, clayey SAND; a few slightly cemented layers up to a few inches thick. Sampler refusal after 10 inches.
60							



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
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FIGURE  
A-26

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>04/05/06</u> BORING NO. <u>B-21</u> GROUND ELEVATION <u>1,725.8± MSL</u> SHEET <u>4</u> OF <u>4</u> METHOD OF DRILLING <u>Mobile B-61 HDX 8-inch hollow-stem auger drill rig</u> DRIVE WEIGHT <u>140 lbs. (cathead)</u> DROP <u>30"</u> SAMPLED BY <u>RCH</u> LOGGED BY <u>RCH</u> REVIEWED BY <u>EDE</u>		
	Bulk	Driven						DESCRIPTION/INTERPRETATION		
60			31	29.3			SC	<b>ALLUVIUM (continued):</b> Brown, saturated, dense, clayey SAND; moderately hard; moderately cemented layers up to a few inches thick.		
65										
70			36	37.0	106.0		CL	Brown, saturated, very stiff, sandy lean CLAY.		
75								Total depth = 71.5 feet. Groundwater encountered at approximately 45.0 feet during drilling. Groundwater measured at approximately 34.8 feet approximately 24 hours after drilling. Backfilled on 04/07/06.  Note: Boring location approximately 120 feet east of NDOT Station No. 733+40.		
80										



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
 HENDERSON, NEVADA

PROJECT NO.  
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FIGURE  
A-27

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/28 and 04/07/06</u>	BORING NO. <u>B-22</u>
	Bulk	Driven						GROUND ELEVATION <u>1,718'± MSL</u>	SHEET <u>1</u> OF <u>4</u>
								METHOD OF DRILLING <u>Mayhew 1000 mud-rotary 8-inch drill rig</u>	
								DRIVE WEIGHT <u>340 lbs. (auto trip hammer)</u>	DROP <u>30"</u>
								SAMPLED BY <u>RCH</u> LOGGED BY <u>RCH</u> REVIEWED BY <u>EDE</u>	
<b>DESCRIPTION/INTERPRETATION</b>									

0						GP-GM	<u>FILL:</u> Brown, damp, very dense, poorly graded GRAVEL with silt and sand.
		57	3.7	118.2		SP-SM	<u>ALLUVIUM:</u> Brown, damp, very dense, poorly graded SAND with silt, gravel, cobbles, and boulders.
						GP-GM	Brown, damp, very dense, poorly graded GRAVEL with silt, sand, cobbles, and boulders.  Dense.
5		34	5.2				
10		29					Medium dense.
15		51	7.9				Dense.
						SP-SM	Damp, dense, poorly graded SAND with silt; gravel; and cobbles.
20							

	<b>BORING LOG</b>		
	GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE HENDERSON, NEVADA		
	PROJECT NO. 301458002	DATE 10/06	FIGURE A-28

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/28 and 04/07/06</u> BORING NO. <u>B-22</u>	
	Bulk	Driven						GROUND ELEVATION <u>1,718± MSL</u>	SHEET <u>2</u> OF <u>4</u>
								METHOD OF DRILLING <u>Mayhew 1000 mud-rotary 8-inch drill rig</u>	
								DRIVE WEIGHT <u>340 lbs. (auto trip hammer)</u> DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u> LOGGED BY <u>RCH</u> REVIEWED BY <u>EDE</u>	
								<b>DESCRIPTION/INTERPRETATION</b>	
20			32				SP-SM	ALLUVIUM (continued): Brown, wet, dense, poorly graded SAND with silt; gravel; and cobbles.	
25			50/4"	9.9			GP-GM	Brown, saturated, very dense, poorly graded GRAVEL with silt, sand, and cobbles.  Sampler refusal after 10 inches.	
30								Brown, saturated, very hard, CALICHE; strongly cemented; composed primarily of coarse-grained material.	
35			67	5.3			GP-GM	Dark brown, saturated, very dense, poorly graded GRAVEL with silt and sand; slightly cemented.	
40							SC	Brown, saturated, dense, clayey SAND; a few clay layers up to a few inches thick.	



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

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FIGURE  
A-29

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/28 and 04/07/06</u>	BORING NO. <u>B-22</u>	
	Bulk	Driven						GROUND ELEVATION <u>1,718± MSL</u>	SHEET <u>3</u> OF <u>4</u>	
								METHOD OF DRILLING <u>Mayhew 1000 mud-rotary 8-inch drill rig</u>		
								DRIVE WEIGHT <u>340 lbs. (auto trip hammer)</u>	DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u>	LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>
								<b>DESCRIPTION/INTERPRETATION</b>		

40			95	22.8	108.3		SC	<u>ALLUVIUM (continued):</u> Brown, saturated, dense, clayey SAND; a few clay layers up to a few inches thick.
45			27	27.2				Medium dense.
50			50/4"	20.3	108.0		SP-SM	Brown, saturated, very dense, poorly graded SAND. Sampler refusal after 10 inches.
55			50/4"	14.7				GC
60							SP-SM	Brown, saturated, very dense, poorly graded SAND with a few small clay nodules/lenses.



<b>BORING LOG</b>		
GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE HENDERSON, NEVADA		
PROJECT NO. 301458002	DATE 10/06	FIGURE A-30

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/28 and 04/07/06</u> BORING NO. <u>B-22</u>	
	Bulk	Driven						GROUND ELEVATION <u>1,718± MSL</u>	SHEET <u>4</u> OF <u>4</u>
								METHOD OF DRILLING <u>Mayhew 1000 mud-rotary 8-inch drill rig</u>	
								DRIVE WEIGHT <u>340 lbs. (auto trip hammer)</u> DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u> LOGGED BY <u>RCH</u> REVIEWED BY <u>EDE</u>	
								<b>DESCRIPTION/INTERPRETATION</b>	
60							SP-SM	<u>ALLUVIUM (continued):</u> Brown, saturated, very dense, poorly graded SAND with silt; a few small clay nodules/ lenses.	
65			50/2"	14.4	114.9			Sampler refusal after 8 inches.	
70									
75			50/4"					Brown, saturated, moderately hard, CALICHE; moderately cemented; composed primarily of coarse-grained material.	
								Sampler refusal after 4 inches. Total depth = 75.3 feet. Groundwater measured at approximately 21.9 feet 72 hours after drilling. Backfilled on 04/13/06.	
80								Note: Boring location approximately 145 feet west of NDOT Station No. 728+65.	



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
 HENDERSON, NEVADA

PROJECT NO. 301458002	DATE 10/06	FIGURE A-31
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DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>3/10, 3/17, and 3/24/06</u> BORING NO. <u>B-23</u>		
	Bulk	Driven						GROUND ELEVATION <u>1,716± MSL</u>	SHEET <u>1</u> OF <u>4</u>	METHOD OF DRILLING <u>CME 95 8-inch hollow-stem auger drill rigs</u>
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u>	LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>
								<b>DESCRIPTION/INTERPRETATION</b>		
0							GP-GM	<u>FILL:</u> Brown, damp, dense, poorly graded GRAVEL with silt, sand, cobbles, and boulders.		
			73	4.0	120.2		GP-GM	<u>ALLUVIUM:</u> Brown, damp, dense, poorly graded GRAVEL with silt, sand, cobbles, and boulders.		
							SM	Brown, damp, dense, silty SAND with gravel, cobbles, and boulders.		
5			36	0.6			GP-GM	Brown, damp, dense, poorly graded GRAVEL with silt, sand, and cobbles.		
							SM	Brown, damp, very dense, silty SAND with gravel.		
10			87/10"	5.9	109.4		GP-GM	Brown, damp, very dense, poorly graded GRAVEL with silt, sand, cobbles, and boulders. Sampler refusal after 16 inches.		
							SP-SM	Brown, damp, very dense, poorly graded SAND with silt, gravel, and cobbles.		
15			53	2.2			GP-GM	Brown, damp, very dense, poorly graded GRAVEL with silt, sand, and cobbles.		
							SP-SM	Brown, damp, medium dense, poorly graded SAND with silt and gravel.		
20			50	5.1	111.4					



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

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FIGURE  
A-32

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>3/10, 3/17, and 3/24/06</u> BORING NO. <u>B-23</u>	
	Bulk	Driven						GROUND ELEVATION <u>1,716± MSL</u>	SHEET <u>2</u> OF <u>4</u>
								METHOD OF DRILLING <u>CME 95 8-inch hollow-stem auger drill rigs</u>	
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u> DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u> LOGGED BY <u>RCH</u> REVIEWED BY <u>EDE</u>	
								<b>DESCRIPTION/INTERPRETATION</b>	
20							SP-SM	ALLUVIUM (continued): Brown, damp, medium dense, poorly graded SAND with silt and gravel.	
							SW-SM	Brown, damp, very dense, well-graded SAND with silt, gravel, cobbles, and boulders. Saturated.	
			50/3"	8.9				Sampler refusal after 9 inches.	
25									
								Brown, saturated, very hard, CALICHE; strongly cemented; composed primarily of coarse-grained material.	
			50/<1"					Approximately 3-foot diameter boulder.	
30									
							SM	Brown, saturated, very dense, silty SAND with gravel.	
35									
40									

**Ninyo & Moore**

**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

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FIGURE  
A-33

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.				
	Bulk	Driven						3/10, 3/17, and 3/24/06	B-23				
								GROUND ELEVATION	SHEET	OF			
								METHOD OF DRILLING	CME 95 8-inch hollow-stem auger drill rigs				
								DRIVE WEIGHT	140 lbs. (auto trip hammer)	DROP	30"		
								SAMPLED BY	RCH	LOGGED BY	RCH	REVIEWED BY	EDE
<b>DESCRIPTION/INTERPRETATION</b>													
40			50/3"				SM	<b>ALLUVIUM (continued):</b> Brown saturated, very dense, silty SAND with gravel. Sampler refusal after 3 inches.					
				77	15.3	120.7	GM	Brown, saturated, very dense, silty GRAVEL with sand.					
45								Trace clay.					
			50/4"	28.9	95.6			Sampler refusal after 10 inches.					
50							CL	Brown, saturated, very stiff, lean CLAY with sand and silt.					
55													
60													



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

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FIGURE  
A-34

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.				
	Bulk	Driven						3/10, 3/17, and 3/24/06	B-23				
								GROUND ELEVATION	SHEET	OF			
								METHOD OF DRILLING	CME 95 8-inch hollow-stem auger drill rigs				
								DRIVE WEIGHT	140 lbs. (auto trip hammer)	DROP	30"		
								SAMPLED BY	RCH	LOGGED BY	RCH	REVIEWED BY	EDE
								<b>DESCRIPTION/INTERPRETATION</b>					
60			30	29.6			CL	<u>ALLUVIUM (continued):</u> Brown, saturated, very stiff, lean CLAY with sand and silt.					
65													
70			95/9"	42.9	81.9			Sampler refusal after 15 inches.					
75			53	49.1	72.2								
80								Total depth = 76.5 feet. Groundwater encountered at approximately 23.0 feet during drilling. Groundwater measured at approximately 21.5 feet approximately 4 days after drilling. Backfilled on 03/27/06.  Note: Boring location approximately 100 feet east of NDOT Station No. 725+93.					

**Ninyo & Moore**

**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

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FIGURE  
A-35

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/10/06</u> BORING NO. <u>B-24</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>CME 75 8-inch hollow-stem auger drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u> DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u> LOGGED BY <u>RCH</u> REVIEWED BY <u>EDE</u>	
								<b>DESCRIPTION/INTERPRETATION</b>	
0							GM	FILL: Brown, damp, dense, silty GRAVEL with sand, cobbles, and boulders.	
			36	2.2			GP-GM	ALLUVIUM: Brown, damp, dense, poorly graded GRAVEL with silt, sand, cobbles, and boulders.	
							GM	Brown, damp, very dense, silty GRAVEL with sand, cobbles, and boulders.	
			50/3"					Sampler refusal after 3 inches.	
5							SM	Brown, damp, very dense, silty SAND with gravel.	
10			35	10.3				Total depth = 10.5 feet. Groundwater not encountered during drilling. Backfilled on 03/10/06.	
								Note: Boring location approximately 125 feet west of NDOT Station No. 724+35.	
15									
20									



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO. 301458002	DATE 10/06	FIGURE A-36
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DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.				
	Bulk	Driven						02/06/06	B-25				
								GROUND ELEVATION	SHEET	OF			
								METHOD OF DRILLING	Mobile B-61 8-inch HDX hollow-stem auger drill rig				
								DRIVE WEIGHT	140 lbs. (cathead)	DROP	30"		
								SAMPLED BY	MAB	LOGGED BY	MAB	REVIEWED BY	EDE
								<b>DESCRIPTION/INTERPRETATION</b>					
0							GM	<b>ASPHALT CONCRETE:</b> Approximately 4-1/2" to 5" thick.					
							SM	<b>FILL:</b> Dark brown, damp, dense, silty GRAVEL with sand (aggregate base material); unit is approximately 7.5 inches to 8.0 inches thick.					
								<b>ALLUVIUM:</b> Dark brown, very dense, silty SAND with gravel.					
			50/4"					Sampler refusal after 4 inches.					
5			37	5.5									
10			50/5"	4.3	105.8			Sampler refusal after 5 inches.					
								Total depth = 10.4 feet. Groundwater not encountered during drilling. Backfilled and patched on 02/06/06.					
15													
20													



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
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FIGURE  
A-37

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>02/06/06</u> BORING NO. <u>B-26</u>		
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>1</u>	METHOD OF DRILLING <u>Mobile B-61 8-inch HDX hollow-stem auger drill rig</u>
								DRIVE WEIGHT <u>140 lbs. (cathead)</u>	DROP <u>30"</u>	SAMPLED BY <u>MAB</u> LOGGED BY <u>MAB</u> REVIEWED BY <u>EDE</u>
								<b>DESCRIPTION/INTERPRETATION</b>		
0							GM	<u>FILL:</u> Brown, damp, dense, silty GRAVEL with sand.		
							GM			
			38	5.4			SM	<u>ALLUVIUM:</u> Dark brown, damp, dense, silty GRAVEL with sand, cobbles, and boulders. Dark brown, damp, very dense, silty SAND with gravel, cobbles, and boulders.		
5			50/3"	3.6	103.0			Sampler refusal after 9 inches.		
								Increase in gravel content.		
			50/3"	4.9				Sampler refusal after 9 inches.		
10								Total depth = 9.8 feet. Groundwater not encountered during drilling. Backfilled on 02/06/06.		
15										
20										



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO. 301458002	DATE 10/06	FIGURE A-38
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DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>02/06/06</u> BORING NO. <u>B-27</u>		
	Bulk	Driven						GROUND ELEVATION <u>1,699.22± MSL</u>	SHEET <u>1</u> OF <u>1</u>	METHOD OF DRILLING <u>Mobile B-61 8-inch HDX hollow-stem auger drill rig</u>
								DRIVE WEIGHT <u>140 lbs. (cathead)</u>	DROP <u>30"</u>	
								SAMPLED BY <u>MAB</u>	LOGGED BY <u>MAB</u>	REVIEWED BY <u>EDE</u>
<b>DESCRIPTION/INTERPRETATION</b>										
0							GM	<b>FILL:</b> Brown, damp, dense, silty GRAVEL with sand, cobbles, and boulders.		
			56				GM	<b>ALLUVIUM:</b> Dark brown, damp, dense, silty GRAVEL with sand, cobbles, and boulders.		
							SW-SM	Dark brown, damp, dense, well-graded SAND with silt, gravel, cobbles, and boulders.		
5			81/9"	5.7				Very dense; sampler refusal after 15 inches.		
							GM	Dark brown, damp, dense, silty GRAVEL with sand, cobbles, and boulders.		
10			86/11"	4.3	112.3		SM	Dark brown, damp, very dense, silty SAND with gravel, cobbles, and boulders. Sampler refusal after 17 inches.		
								Total depth = 10.4 feet. Groundwater not encountered during drilling. Backfilled on 02/06/06.		
15										
20										

**Ninyo & Moore**

**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

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FIGURE  
A-39

DEPTH (feet)	SAMPLES	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.	
							03/07/06	B-28	
							GROUND ELEVATION	SHEET	OF
							1,693± MSL	1	6
							METHOD OF DRILLING		
							CME-75 8-inch hollow-stem auger drill rig		
							DRIVE WEIGHT	DROP	
							140 lbs. (auto trip hammer)	30"	
							SAMPLED BY	LOGGED BY	REVIEWED BY
							RCH	RCH	EDE
							<b>DESCRIPTION/INTERPRETATION</b>		
0						GM	FILL:		
						SP-SM	Brown, damp, medium dense, silty GRAVEL with sand and cobbles.		
		53	4.2	119.4			ALLUVIUM:		
							Brown, damp, dense, poorly graded SAND with silt and gravel.		
							Increase in gravel content.		
5						GP-GM	Brown, damp, medium dense, poorly graded GRAVEL with silt and sand.		
		23	4.9	117.1					
10							Very dense.		
		41				SC	Reddish brown, moist, very dense, clayey SAND; a few layers of clay with gravel and cobbles up to a few inches thick. Saturated.		
15							Sampler refusal.		
		50/0"							
20						SM	Light brown, saturated, dense, silty fine-grained SAND.		
		31	24.9						

**Ninyo & Moore**

**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
301458002

DATE  
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FIGURE  
A-40

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/07/06</u>	BORING NO. <u>B-28</u>	
	Bulk	Driven						GROUND ELEVATION <u>1,693± MSL</u>	SHEET <u>2</u> OF <u>6</u>	
								METHOD OF DRILLING <u>CME-75 8-inch hollow-stem auger drill rig</u>		
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u>	LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>
								<b>DESCRIPTION/INTERPRETATION</b>		

20							SC	ALLUVIUM (continued): Light brown, saturated, dense, clayey SAND; a few moderately hard, moderately cemented layers up to a few inches thick.
25		60	24.9				SM	Brown, saturated, very dense, silty SAND; slightly cemented; a few clay layers up to a few inches thick.
30		50/4" 50/5"	21.6					Sampler refusal after 4 inches. Sampler refusal after 11 inches.
35		41	29.5	90.6			CL	Light brown, saturated, very stiff, lean CLAY; slightly cemented.
40		83					SC	Light brown, saturated, very dense, clayey SAND; a few moderately cemented; moderately hard layers up to a few inches thick.



BORING LOG		
GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE HENDERSON, NEVADA		
PROJECT NO. 301458002	DATE 10/06	FIGURE A-41

DEPTH (feet)	Bulk	SAMPLES	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/07/06</u>	BORING NO. <u>B-28</u>	
	Driven							GROUND ELEVATION <u>1,693± MSL</u>	SHEET <u>3</u> OF <u>6</u>	
METHOD OF DRILLING <u>CME-75 8-inch hollow-stem auger drill rig</u>								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>		DROP <u>30"</u>
SAMPLED BY <u>RCH</u>								LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>	
<b>DESCRIPTION/INTERPRETATION</b>										

40							SC	<u>ALLUVIUM (continued):</u> Light brown, saturated, very dense, clayey SAND; a few moderately cemented, moderately hard layers up to a few inches thick.		
45	50/3"		22.4	104.5			SM	Brown, saturated, very dense, silty SAND; a few moderately hard, moderately cemented layers up to a few inches thick. Sampler refusal after 9 inches.		
50	22		40.7				SC	Light brown, saturated, medium dense, clayey SAND; a few moderately hard; moderately cemented; layers up to a few inches thick.		
55	62		39.2	82.3			CL	Light brown, saturated, very stiff, sandy lean CLAY.		
60	30		38.1				SC	Brown, saturated, medium dense to dense, clayey SAND.		

**Ninyo & Moore**

**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

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FIGURE  
A-42

DEPTH (feet)	Bulk	SAMPLES	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/07/06</u>	BORING NO. <u>B-28</u>	
	Driven							GROUND ELEVATION <u>1,693± MSL</u>	SHEET <u>4</u> OF <u>6</u>	
METHOD OF DRILLING <u>CME-75 8-inch hollow-stem auger drill rig</u>								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>		DROP <u>30"</u>
SAMPLED BY <u>RCH</u>								LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>	
<b>DESCRIPTION/INTERPRETATION</b>										

60	▲						SC	<u>ALLUVIUM (continued):</u> Brown, saturated, medium dense to dense, clayey SAND.		
65										
70	■	24	38.7	81.4				Medium dense.		
75										
80	▲	37	37.9			/	CL	Brown, saturated, very stiff, sandy lean CLAY; a few slightly cemented layers up to a few inches thick.		

# Ninyo & Moore

## BORING LOG

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

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FIGURE  
A-43

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/07/06</u>	BORING NO. <u>B-28</u>	
	Bulk	Driven						GROUND ELEVATION <u>1,693± MSL</u>	SHEET <u>5</u> OF <u>6</u>	
								METHOD OF DRILLING <u>CME-75 8-inch hollow-stem auger drill rig</u>		
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u>	LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>
								<b>DESCRIPTION/INTERPRETATION</b>		

80						CL	<u>ALLUVIUM (continued):</u> Brown, saturated, very stiff, sandy lean CLAY; a few slightly cemented layers up to a few inches thick.
85							
90		41	40.2	80.4		SC	Brown, saturated, medium dense, clayey SAND.
95							
100		24	35.5	--		CL	Light brown, saturated, very stiff, sandy lean CLAY; a few slightly cemented layers up to a few inches thick.

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## BORING LOG

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
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FIGURE  
A-44



DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/09/06</u>	BORING NO. <u>B-29</u>	
	Bulk	Driven						GROUND ELEVATION <u>1,693.99± MSL</u>	SHEET <u>1</u> OF <u>4</u>	
METHOD OF DRILLING <u>CME 75 8-inch hollow-stem auger drill rig</u>								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>		DROP <u>30"</u>
SAMPLED BY <u>RCH</u>			LOGGED BY <u>RCH</u>			REVIEWED BY <u>EDE</u>				
<b>DESCRIPTION/INTERPRETATION</b>										

0							GM	<u>FILL:</u> Brown, damp, medium dense, silty GRAVEL with sand and cobbles.	
			27	4.3	116.3		SM	Brown, damp, medium dense, silty SAND with gravel.	
							SP-SM	<u>ALLUVIUM:</u> Brown, damp, medium dense, poorly graded SAND with silt and gravel; slightly gypsiferous.	
5			20	3.6					
							GP-GM	Brown, damp, very dense, poorly graded GRAVEL with silt, sand, and cobbles.	
			50/5"	5.1	115.9			Sampler refusal after 11 inches.	
10									
			50/4"					Saturated; sampler refusal after 10 inches.	
15									
								Layer of clay approximately 6 inches thick.	
							SM	Brown, saturated, very dense, silty SAND; slightly cemented.	
			50/2"	15.1	96.6			Sampler refusal after 8 inches.	
20									



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

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FIGURE  
A-46

DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/09/06</u>	BORING NO. <u>B-29</u>	
	Driven						GROUND ELEVATION <u>1,693.99± MSL</u>	SHEET <u>2</u> OF <u>4</u>	
							METHOD OF DRILLING <u>CME 75 8-inch hollow-stem auger drill rig</u>		
							DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>	
							SAMPLED BY <u>RCH</u>	LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>
<b>DESCRIPTION/INTERPRETATION</b>									

20						SM	ALLUVIUM (continued): Brown, saturated, very dense, silty SAND; slightly cemented.	
						CL	Brown, saturated, very stiff, sandy lean CLAY.	
25		23	28.3			SM	Brown, saturated, medium dense, silty SAND; a few clay layers up to a few inches thick.	
30		8						
35		55				CL	Brown, saturated, very stiff, sandy lean CLAY; a few clayey sand layers up to a few inches thick.	
40		50/4"	19.0	109.4		SP-SM	Brown, damp, very dense, poorly graded SAND with silt; few gravel. Sampler refusal after 10 inches.	



<b>BORING LOG</b>		
GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE HENDERSON, NEVADA		
PROJECT NO. 301458002	DATE 10/06	FIGURE A-47

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/09/06</u>	BORING NO. <u>B-29</u>	
	Bulk	Driven						GROUND ELEVATION <u>1,693.99± MSL</u>	SHEET <u>3</u> OF <u>4</u>	
METHOD OF DRILLING <u>CME 75 8-inch hollow-stem auger drill rig</u>								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>		DROP <u>30"</u>
SAMPLED BY <u>RCH</u>								LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>	
<b>DESCRIPTION/INTERPRETATION</b>										

40							SP-SM	ALLUVIUM (continued): Brown, damp, very dense, poorly graded SAND with silt; few gravel.		
45	28						SC	Brown, saturated, medium dense, clayey SAND; a few moderately hard, moderately cemented layers up to a few inches thick; a few clay layers up to a few inches thick; moderately gypsiferous.		
50	62	42.4	83.0							
55										
60	44	25.5					SP-SM	Brown, saturated, very dense, poorly graded SAND with silt and gravel; several clay layers up to a few inches thick.		



<b>BORING LOG</b>		
GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE HENDERSON, NEVADA		
PROJECT NO. 301458002	DATE 10/06	FIGURE A-48

DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/09/06</u>	BORING NO. <u>B-29</u>
	Driven						GROUND ELEVATION <u>1,693.99± MSL</u>	SHEET <u>4</u> OF <u>4</u>
							METHOD OF DRILLING <u>CME 75 8-inch hollow-stem auger drill rig</u>	
							DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>
							SAMPLED BY <u>RCH</u> LOGGED BY <u>RCH</u> REVIEWED BY <u>EDE</u>	
<b>DESCRIPTION/INTERPRETATION</b>								

60	▲					SP-SM	<b>ALLUVIUM (continued):</b> Brown, saturated, very dense, poorly graded SAND with silt and gravel; several clay layers up to a few inches thick.	
65								
70	■	50/5"	23.9	100.3				
75	▲	50/3"					Sampler refusal after 3 inches. Total depth = 74.3 feet. Groundwater encountered at approximately 23.0 feet during drilling. Groundwater measured at approximately 14.4 feet approximately 48 hours after drilling. Backfilled on 03/11/06.	
80							Note: Boring location approximately 110 feet east of NDOT Station No. 759+75.	



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO. 301458002	DATE 10/06	FIGURE A-49
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DEPTH (feet)	BULK SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.	
							02/06/06	B-30	
							GROUND ELEVATION	SHEET	OF
							1,678.30± MSL	1	1
							METHOD OF DRILLING		
							Mobile B-61 8-inch HDX hollow-stem auger drill rig		
							DRIVE WEIGHT	DROP	
							140 lbs. (cathead)	30"	
							SAMPLED BY	LOGGED BY	REVIEWED BY
							MAB	MAB	EDE
							<b>DESCRIPTION/INTERPRETATION</b>		
0						SM	<b>FILL:</b> Brown, damp, very loose to loose, silty SAND with gravel; severely gypsiferous.		
						ML	<b>ALLUVIUM:</b> Brown, damp, very stiff, sandy SILT; trace gravel; highly gypsiferous.		
		37	22.2						
						CH	Reddish brown, damp to moist, very stiff, sandy fat CLAY; moderately gypsiferous.		
5		82/11"	19.0	108.8			Very dense; sampler refusal after 17 inches.		
						CL	Reddish brown, damp to moist, very stiff, lean CLAY with sand; slightly to moderately gypsiferous.		
10		82	20.4						
							Total depth = 10.5 feet. Groundwater not encountered during drilling. Backfilled on 02/06/06.		
15									
20									



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

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FIGURE  
A-50

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>02/06/06</u> BORING NO. <u>B-31</u>		
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>1</u>	METHOD OF DRILLING <u>Mobile B-61 8-inch HDX hollow-stem auger drill rig</u>
								DRIVE WEIGHT <u>140 lbs. (cathead)</u>	DROP <u>30"</u>	
								SAMPLED BY <u>MAB</u>	LOGGED BY <u>MAB</u>	REVIEWED BY <u>EDE</u>
<b>DESCRIPTION/INTERPRETATION</b>										
0							SM	<u>ALLUVIUM:</u> Brown, saturated, loose, silty SAND; trace gravel.		
			50/3"	15.6	109.6			Very dense; sampler refusal after 9 inches.		
			50/3"				CL	Reddish brown, saturated, very stiff, sandy lean CLAY; a few layers of clayey GRAVEL approximately a few inches thick.		
5								Sampler refusal after 9 inches.		
			50/2"	16.0	110.3		SC	Reddish brown, saturated, very dense, clayey SAND with gravel.		
								Sampler refusal after 8 inches.		
10								Total depth = 9.7 feet. Groundwater measured at ground surface approximately 24 hours after drilling. Backfilled on 02/07/06.		
15										
20										



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
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FIGURE  
A-51

DEPTH (feet)	Bulk Driven	SAMPLES	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.	
								02/06/06	B-32	
								GROUND ELEVATION	SHEET	OF
								Not measured	1	1
								METHOD OF DRILLING		
								Mobile B-61 8-inch HDX hollow-stem auger drill rig		
								DRIVE WEIGHT	DROP	
								140 lbs. (cathead)	30"	
								SAMPLED BY	LOGGED BY	REVIEWED BY
								MAB	MAB	EDE
								<b>DESCRIPTION/INTERPRETATION</b>		
0							GM	<u>FILL:</u> Brown, damp, dense, silty GRAVEL with sand.		
							GM	<u>ALLUVIUM:</u> Dark brown, damp, very dense, silty GRAVEL with sand.		
			86/9"	4.0				Sampler refusal after 15 inches.		
5			30	5.5	108.7		SM	Dark brown, damp, medium dense, silty SAND with gravel.		
			75/9"	3.4				Very dense; sampler refusal after 15 inches.		
10								Total depth = 10.3 feet. Groundwater not encountered during drilling. Backfilled on 02/06/06.		
15										
20										

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**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

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FIGURE  
A-52

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/07/06</u> BORING NO. <u>B-33</u>	
	Bulk	Driven						GROUND ELEVATION <u>1,678.01± MSL</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>CME 75 8-inch hollow-stem auger drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u> DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u> LOGGED BY <u>RCH</u> REVIEWED BY <u>EDE</u>	
<b>DESCRIPTION/INTERPRETATION</b>									
0							GM	<u>FILL:</u> Brown, damp, dense, silty GRAVEL with sand and cobbles.	
			83	4.0	125.7		GP-GM	<u>ALLUVIUM:</u> Brown, damp, very dense, poorly graded GRAVEL with silt, sand, and cobbles.	
			50/4"					Sampler refusal after 10 inches.	
5				2.9					
			75	4.3	116.6				
10								Total depth = 10.5 feet. Groundwater not encountered during drilling. Backfilled on 03/07/06.	
15									
20									



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
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FIGURE  
A-53

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>02/06/06</u> BORING NO. <u>B-34</u>		
	Bulk	Driven						GROUND ELEVATION <u>1,668.21'± MSL</u>	SHEET <u>1</u> OF <u>1</u>	METHOD OF DRILLING <u>Mobile B-61 8-inch HDX hollow-stem auger drill rig</u>
								DRIVE WEIGHT <u>140 lbs. (cathead)</u>	DROP <u>30"</u>	SAMPLED BY <u>MAB</u> LOGGED BY <u>MAB</u> REVIEWED BY <u>EDE</u>
<b>DESCRIPTION/INTERPRETATION</b>										
0							GM	<u>FILL:</u> Brown, damp, dense, silty GRAVEL with sand, cobbles, and boulders.		
							GM	<u>ALLUVIUM:</u> Brown, damp, very dense, silty GRAVEL with sand, cobbles, and boulders.		
			50/4"					Sampler refusal after 10 inches.		
5			76	4.3						
			50/4"	4.1	112.2			Sampler refusal after 10 inches.		
10								Total depth = 9.8 feet. Groundwater not encountered during drilling. Backfilled on 02/06/06.		
15										
20										

**Ninyo & Moore**

**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

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FIGURE  
A-54

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.	
	Bulk	Driven						03/07/06	B-35	
								GROUND ELEVATION	SHEET	OF
								METHOD OF DRILLING		
								DRIVE WEIGHT	DROP	
								SAMPLED BY	LOGGED BY	REVIEWED BY
								<b>DESCRIPTION/INTERPRETATION</b>		
0								<b>ASPHALT:</b> Approximately 6-1/2 to 6-3/4 inches thick.		
			44	5.5	113.5		GP-GM	<b>FILL:</b> Brown, damp, medium dense, poorly graded GRAVEL with silt and sand (aggregate base); unit is approximately 5-1/2 inches thick.		
			76	5.2	114.9		GP-GM	<b>ALLUVIUM:</b> Brown, damp, dense, poorly graded GRAVEL with silt and sand.  Very dense.		
5								Dense.		
10			48	5.0	118.0			Total depth = 10.5 feet. Groundwater not encountered during drilling. Backfilled and patched on 03/07/06.		
15										
20										



**BORING LOG**

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FIGURE  
 A-55

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>02/06/06</u> BORING NO. <u>B-36</u>	
	Bulk	Driven						GROUND ELEVATION <u>1,651.39± MSL</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>Mobile B-61 8-inch HDX hollow-stem auger drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (cathead)</u> DROP <u>30"</u>	
								SAMPLED BY <u>MAB</u> LOGGED BY <u>MAB</u> REVIEWED BY <u>EDE</u>	
								<b>DESCRIPTION/INTERPRETATION</b>	
0							GP-GM	FILL:	
							GM	Brown to light brown, damp, loose, poorly graded GRAVEL with silt and sand.	
								ALLUVIUM:	
								Dark brown, damp, very dense, silty GRAVEL with sand.	
			50/5"	5.6	111.3			Sampler refusal after 11 inches.	
							SM	Dark brown, damp, very dense, silty GRAVEL with sand.	
			50/5"	5.9				Sampler refusal after 11 inches.	
5									
10			36	5.5				Dense.	
								Total depth = 10.5 feet.	
								Groundwater not encountered during drilling.	
								Backfilled on 02/06/06.	
15									
20									

**Ninyo & Moore**

**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO. 301458002	DATE 10/06	FIGURE A-56
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DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/06/06</u>	BORING NO. <u>B-37</u>
	Bulk	Driven						GROUND ELEVATION <u>1,692.70± MSL</u>	SHEET <u>1</u> OF <u>3</u>
METHOD OF DRILLING <u>CME-75 8-inch hollow-stem auger drill rig</u>									
DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u> DROP <u>30"</u>									
SAMPLED BY <u>NB</u> LOGGED BY <u>NB</u> REVIEWED BY <u>EDE</u>									
<b>DESCRIPTION/INTERPRETATION</b>									

0							GM	FILL:
							GP-GM	Brown, damp, medium dense, silty GRAVEL with sand, cobbles, and boulders.
							SP-SM	<u>ALLUVIUM:</u> Brown, damp, dense, poorly graded GRAVEL with silt, sand, cobbles, and boulders.
	50/6"						GP-GM	Brown, damp, very dense, poorly graded SAND with silt, gravel, and cobbles.
								Sampler refusal after 6 inches.
5	84/9"	4.3	127.9					Sampler refusal after 15 inches.
10	50/6"						SP-SM	Brown, damp, very dense, poorly graded SAND with silt and gravel.
								Sampler refusal after 12 inches.
								Saturated.
15	50/2"						SM	Brown, saturated, very dense, silty SAND with gravel and cobbles.
								Sampler refusal after 2 inches.
							SC	Brown, saturated, dense, clayey SAND with silt and gravel.
20								



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
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FIGURE  
A-57

DEPTH (feet)	SAMPLES Bulk Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/06/06</u> BORING NO. <u>B-37</u>
							GROUND ELEVATION <u>1,692.70± MSL</u> SHEET <u>2</u> OF <u>3</u>
							METHOD OF DRILLING <u>CME-75 8-inch hollow-stem auger drill rig</u>
							DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u> DROP <u>30"</u>
							SAMPLED BY <u>NB</u> LOGGED BY <u>NB</u> REVIEWED BY <u>EDE</u>
<b>DESCRIPTION/INTERPRETATION</b>							

20	47			CL	ALLUVIUM (continued): Brown, saturated, very stiff, sandy lean CLAY.
25	48	16.7	120.1	SM	Brown, saturated, dense, silty SAND.
30	14			CL	Brown, saturated, very stiff, sandy lean CLAY.  A few silty sand layers up to a few inches thick.
35	12	32.3	84.1		Stiff.
40					



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO. 301458002	DATE 10/06	FIGURE A-58
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DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/06/06</u> BORING NO. <u>B-37</u> GROUND ELEVATION <u>1,692.70± MSL</u> SHEET <u>3</u> OF <u>3</u> METHOD OF DRILLING <u>CME-75 8-inch hollow-stem auger drill rig</u> DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u> DROP <u>30"</u> SAMPLED BY <u>NB</u> LOGGED BY <u>NB</u> REVIEWED BY <u>EDE</u>		
	Bulk	Driven						DESCRIPTION/INTERPRETATION		
40			18				CL	<u>ALLUVIUM (continued):</u> Brown, saturated, very stiff, sandy lean CLAY.		
45			50/6"	23.1	104.3			Sampler refusal after 12 inches.		
45								Total depth = 45.0 feet. Groundwater encountered at approximately 20.0 feet during drilling. Groundwater measured at approximately 11.4 feet approximately 48 hours after drilling. Backfilled on 09/08/06.		
50								Note: Boring location approximately 140 feet west of NDOT Station No. 759+75.		
55										
60										

**Ninyo & Moore**

**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO. 301458002	DATE 10/06	FIGURE A-59
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DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/25/06</u>	BORING NO. <u>B-38</u>	
	Driven						GROUND ELEVATION <u>1,698± MSL</u>	SHEET <u>1</u> OF <u>4</u>	
							METHOD OF DRILLING <u>Mobile B-61 8-inch HDX hollow-stem auger drill rig</u>		
							DRIVE WEIGHT <u>140 lbs. (cathead)</u>	DROP <u>30"</u>	
							SAMPLED BY <u>NB</u>	LOGGED BY <u>NB</u>	REVIEWED BY <u>EDE</u>
<b>DESCRIPTION/INTERPRETATION</b>									

0							<u>CONCRETE:</u> Approximately 12 to 13 inches thick.	
					SP-SM		<u>FILL:</u> Brown, damp, medium dense, poorly graded SAND with silt and gravel.	
5	56				GP-GM		<u>ALLUVIUM:</u> Brown, damp, very dense, poorly graded GRAVEL with silt and sand; a few moderately hard, moderately cemented caliche layers up to a few inches thick.	
10	50/3"						Sampler refusal after 3 inches.	
					SP-SM		Brown, damp, medium dense, poorly graded SAND with silt and gravel.	
15	28				CL		Brown, damp, very stiff, sandy lean CLAY.	
					SP-SM		Brown, damp, medium dense, poorly graded SAND with silt and gravel.	
20								



**BORING LOG**

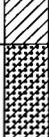
GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
301458002

DATE  
10/06

FIGURE  
A-60

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/25/06</u>	BORING NO. <u>B-38</u>	
	Bulk	Driven						GROUND ELEVATION <u>1,698± MSL</u>	SHEET <u>2</u> OF <u>4</u>	
								METHOD OF DRILLING <u>Mobile B-61 8-inch HDX hollow-stem auger drill rig</u>		
								DRIVE WEIGHT <u>140 lbs. (cathead)</u>	DROP <u>30"</u>	
								SAMPLED BY <u>NB</u>	LOGGED BY <u>NB</u>	REVIEWED BY <u>EDE</u>
								<b>DESCRIPTION/INTERPRETATION</b>		

20		85/11"	22.2	106.1		CL	ALLUVIUM (continued): Reddish brown, damp, very stiff, sandy lean CLAY. Sampler refusal after 17 inches.
25		50/5"				SC	Reddish brown, saturated, very dense, clayey SAND; a few slightly cemented layers up to a few inches thick.  Sampler refusal after 11 inches.
30		28				CL	Reddish brown, saturated, very stiff, sandy lean CLAY.
35		40	39.4	83.9		SC	Reddish brown, saturated, medium dense, clayey SAND; few gravel.
40						CL	Reddish brown, saturated, very stiff, sandy lean CLAY.

**Ninyo & Moore**

**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
301458002

DATE  
10/06

FIGURE  
A-61

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/25/06</u>	BORING NO. <u>B-38</u>
	Bulk	Driven						GROUND ELEVATION <u>1,698± MSL</u>	SHEET <u>3</u> OF <u>4</u>
METHOD OF DRILLING <u>Mobile B-61 8-inch HDX hollow-stem auger drill rig</u>								DRIVE WEIGHT <u>140 lbs. (cathead)</u>	DROP <u>30"</u>
SAMPLED BY <u>NB</u>								LOGGED BY <u>NB</u>	REVIEWED BY <u>EDE</u>
<b>DESCRIPTION/INTERPRETATION</b>									

40						CL	ALLUVIUM (continued): Reddish brown, saturated, very stiff, sandy lean CLAY.
		39					
						SC	Reddish brown, saturated, very dense, clayey SAND; slightly cemented.
45			50/6"	21.8	103.9		Sampler refusal after 12 inches.
						CL	Reddish brown, saturated, very stiff, sandy lean CLAY.
50							
		64					
55							
							Moderately hard, moderately cemented caliche layer up to 6 inches thick.
60							



<b>BORING LOG</b>		
GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE HENDERSON, NEVADA		
PROJECT NO. 301458002	DATE 10/06	FIGURE A-62

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/25/06</u>	BORING NO. <u>B-38</u>	
	Bulk	Driven						GROUND ELEVATION <u>1,698± MSL</u>	SHEET <u>4</u> OF <u>4</u>	
METHOD OF DRILLING <u>Mobile B-61 8-inch HDX hollow-stem auger drill rig</u>								DRIVE WEIGHT <u>140 lbs. (cathead)</u>		DROP <u>30"</u>
SAMPLED BY <u>NB</u>			LOGGED BY <u>NB</u>			REVIEWED BY <u>EDE</u>				
<b>DESCRIPTION/INTERPRETATION</b>										

60	50/2"	19.7	104.1	SC	<p><u>ALLUVIUM (continued):</u>          Reddish brown, saturated, very dense, clayey SAND; a few moderately hard, moderately cemented layers up to a few inches thick. Sampler refusal after 2 inches.</p>
					<p>Brown, saturated, hard, CALICHE; strongly cemented; composed primarily of coarse-grained material.</p>
				CL	<p>Reddish brown, saturated, very stiff, sandy lean CLAY.</p>
65					
70	34				
75	50/4"				<p>Sampler refusal after 4 inches.          Total depth = 75.3 feet.          Groundwater encountered at approximately 24.0 feet during drilling.          Backfilled and patched on 09/25/06.</p>
80					<p>Note: Boring location approximately 5 feet east of NDOT Station No. 759+75.</p>



<b>BORING LOG</b>		
GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE HENDERSON, NEVADA		
PROJECT NO. 301458002	DATE 10/06	FIGURE A-63

DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/21/06</u>	BORING NO. <u>B-39</u>	
	Driven						GROUND ELEVATION <u>1,701± MSL</u>	SHEET <u>1</u> OF <u>2</u>	
							METHOD OF DRILLING <u>Mobile B-61 8-inch HDX hollow-stem auger drill rig</u>		
							DRIVE WEIGHT <u>140 lbs. (cathead)</u>	DROP <u>30"</u>	
							SAMPLED BY <u>NB</u>	LOGGED BY <u>NB</u>	REVIEWED BY <u>EDE</u>
<b>DESCRIPTION/INTERPRETATION</b>									

0							<b>CONCRETE:</b> Approximately 11-1/2 to 12-1/2 inches thick.	
						SP-SM	<b>FILL:</b> Brown, damp, medium dense, poorly graded SAND with silt and gravel.	
5	50/4"					GP-GM	<b>ALLUVIUM:</b> Brown, damp, very dense, poorly graded GRAVEL with silt, sand, and cobbles.  Sampler refusal after 4 inches.	
10		37	3.7	108.4			Medium dense.	
						SP-SM	Brown, damp, dense, poorly graded SAND with silt and gravel.	
15	50/6"					GP-GM	Brown, damp, very dense, poorly graded GRAVEL with silt, sand, and cobbles. Sampler refusal after 12 inches.	
20								



<b>BORING LOG</b>		
GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE HENDERSON, NEVADA		
PROJECT NO. 301458002	DATE 10/06	FIGURE A-64

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/21/06</u> BORING NO. <u>B-39</u>		
	Bulk	Driven						GROUND ELEVATION <u>1,701± MSL</u>	SHEET <u>2</u> OF <u>2</u>	METHOD OF DRILLING <u>Mobile B-61 8-inch HDX hollow-stem auger drill rig</u>
								DRIVE WEIGHT <u>140 lbs. (cathead)</u>	DROP <u>30"</u>	
								SAMPLED BY <u>NB</u>	LOGGED BY <u>NB</u>	REVIEWED BY <u>EDE</u>
								DESCRIPTION/INTERPRETATION		
20			79/9"	20.7	103.6		SC	<u>ALLUVIUM (continued):</u> Brown, damp, very dense, clayey SAND with gravel. Sampler refusal after 15 inches.		
							SP-SM	Brown, damp, very dense, poorly graded SAND with silt and gravel.		
							CL	Brown, damp, very stiff, sandy lean CLAY.		
25			91							
30			80/8"					Sampler refusal after 14 inches.		
								Total depth = 31.2 feet. Groundwater not encountered during drilling. Backfilled on 09/25/06.		
								Note: Boring location approximately 5 feet east of NDOT Station No. 758+80.		
35										
40										



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
301458002

DATE  
10/06

FIGURE  
A-65

DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/06/06</u>	BORING NO. <u>B-40</u>
	Driven						GROUND ELEVATION <u>1,694± MSL</u>	SHEET <u>1</u> OF <u>3</u>
							METHOD OF DRILLING <u>CME-75 8-inch hollow-stem auger drill rig</u>	
							DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>
							SAMPLED BY <u>NB</u>	LOGGED BY <u>NB</u> REVIEWED BY <u>EDE</u>
<b>DESCRIPTION/INTERPRETATION</b>								

0						GM	FILL: Brown, damp, medium dense, silty GRAVEL with sand and cobbles.
						SM	ALLUVIUM: Brown, damp, dense, silty SAND with gravel and cobbles.
5						GP-GM	Brown, damp, very dense, poorly graded GRAVEL with silt, sand, and cobbles.
	50/6"						Sampler refusal after 12 inches.
10						SP-SM	Brown, damp, very dense, poorly graded SAND with silt, gravel, and cobbles.
	50/6"					GP-GM	Brown, damp, very dense, poorly graded GRAVEL with silt, sand, and cobbles.
15							Sampler refusal after 12 inches.
	50/5"						Sampler refusal after 5 inches.
20						GM	Brown, damp to moist, very dense, silty GRAVEL with sand and cobbles.
						SM	Saturated. Brown, saturated, dense, silty SAND with gravel.



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
301458002

DATE  
10/06

FIGURE  
A-66

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/06/06</u>	BORING NO. <u>B-40</u>	
	Bulk	Driven						GROUND ELEVATION <u>1,694± MSL</u>	SHEET <u>2</u> OF <u>3</u>	
								METHOD OF DRILLING <u>CME-75 8-inch hollow-stem auger drill rig</u>		
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>	
								SAMPLED BY <u>NB</u>	LOGGED BY <u>NB</u>	REVIEWED BY <u>EDE</u>
								<b>DESCRIPTION/INTERPRETATION</b>		

<p>20</p> <p>25</p> <p>30</p> <p>35</p> <p>40</p>	<p>46</p> <p>50/5"</p> <p>24</p> <p>33</p>	<p>CL</p>	<p><u>ALLUVIUM (continued):</u> Brown, saturated, very stiff, sandy lean CLAY.</p> <p>A few silty sandy layers up to a few inches thick.</p> <p>Sampler refusal after 5 inches; trace cobbles.</p>
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<b>BORING LOG</b>		
GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE HENDERSON, NEVADA		
PROJECT NO. 301458002	DATE 10/06	FIGURE A-67

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/06/06</u> BORING NO. <u>B-40</u>		
	Bulk	Driven						GROUND ELEVATION <u>1,694± MSL</u>	SHEET <u>3</u> OF <u>3</u>	METHOD OF DRILLING <u>CME-75 8-inch hollow-stem auger drill rig</u>
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>	
								SAMPLED BY <u>NB</u>	LOGGED BY <u>NB</u>	REVIEWED BY <u>EDE</u>
								<b>DESCRIPTION/INTERPRETATION</b>		
40			59/11"				CL	<b>ALLUVIUM (continued):</b> Brown, saturated, very stiff, sandy lean CLAY with gravel. Sampler refusal after 17 inches.		
45			50/5"					Sampler refusal after 11 inches.		
								Total depth = 45.9 feet. Groundwater encountered at approximately 25.0 feet during drilling. Groundwater measured at approximately 18.2 feet approximately 48 hours after drilling. Backfilled on 09/08/06  Note: Boring location approximately 140 feet east of NDOT Station No. 758+85.		
50										
55										
60										

**Ninyo & Moore**

**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO. 301458002	DATE 10/06	FIGURE A-68
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DEPTH (feet)	SAMPLES	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/06/06</u>	BORING NO. <u>B-41</u>	
							GROUND ELEVATION <u>1,680.22± MSL</u>	SHEET <u>1</u> OF <u>3</u>	
							METHOD OF DRILLING <u>CME-75 8-inch hollow-stem auger drill rig</u>		
							DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>	
							SAMPLED BY <u>RCH</u>	LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>
<b>DESCRIPTION/INTERPRETATION</b>									

0						SM	<u>FILL:</u> Brown, damp, loose, silty SAND with gravel and cobbles.
						GM	<u>ALLUVIUM:</u> Brown, damp, medium dense, silty GRAVEL with sand and cobbles.
	8					CL	Brown to reddish brown, damp to moist, stiff, sandy lean CLAY; moderately gypsiferous.
							A few slightly cemented layers a few inches thick.
5		12	28.8	90.6			
			▼				Saturated.
10		42					Very stiff.
15		57	30.9	92.6			
						CL	Brown, saturated, very stiff, sandy lean CLAY.
20							



<b>BORING LOG</b>		
GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE HENDERSON, NEVADA		
PROJECT NO. 301458002	DATE 10/06	FIGURE A-69

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/06/06</u>	BORING NO. <u>B-41</u>
	Bulk	Driven						GROUND ELEVATION <u>1,680.22± MSL</u>	SHEET <u>2</u> OF <u>3</u>
								METHOD OF DRILLING <u>CME-75 8-inch hollow-stem auger drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>
								SAMPLED BY <u>RCH</u> LOGGED BY <u>RCH</u> REVIEWED BY <u>EDE</u>	
<b>DESCRIPTION/INTERPRETATION</b>									

20	11			CL	<p><b>ALLUVIUM (continued):</b> Brown, saturated, very stiff, sandy lean CLAY.</p>
25	50/3"	19.3	113.6	SP-SM	<p>Brown, saturated, very dense, poorly graded SAND with silt.</p> <p>With gravel; sampler refusal after 9 inches.</p> <p>Decrease in gravel content; sampler refusal after 17 inches.</p>
30	89/11"			SW-SM	<p>Brown, saturated, very dense, well-graded SAND with silt and gravel; a moderately hard, moderately cemented layer a few inches thick.</p>
35	78			CL	<p>Brown, saturated, very stiff, lean CLAY; a few moderately hard, moderately cemented layer a few inches thick.</p>
40					



<b>BORING LOG</b>		
GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE HENDERSON, NEVADA		
PROJECT NO. 301458002	DATE 10/06	FIGURE A-70

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/06/06</u>	BORING NO. <u>B-41</u>
	Bulk	Driven						GROUND ELEVATION <u>1,680.22'± MSL</u>	SHEET <u>3</u> OF <u>3</u>
								METHOD OF DRILLING <u>CME-75 8-inch hollow-stem auger drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>
								SAMPLED BY <u>RCH</u> LOGGED BY <u>RCH</u> REVIEWED BY <u>EDE</u>	
<b>DESCRIPTION/INTERPRETATION</b>									

40	41	41.3	76.8	CL	<p><u>ALLUVIUM (continued):</u> Brown, saturated, very stiff, lean CLAY; a few moderately hard, moderately cemented layer a few inches thick.</p>
45	21				

Total depth = 46.5 feet.  
 Groundwater encountered at approximately 23.5 feet during drilling.  
 Groundwater measured at approximately 7.9 feet approximately 48 hours after drilling.  
 Backfilled on 09/08/06.



<b>BORING LOG</b>		
GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE HENDERSON, NEVADA		
PROJECT NO. 301458002	DATE 10/06	FIGURE A-71

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/05/06</u>	BORING NO. <u>B-42</u>	
	Bulk	Driven						GROUND ELEVATION <u>1,678.58± MSL</u>	SHEET <u>1</u> OF <u>3</u>	
								METHOD OF DRILLING <u>CME-75 8-inch hollow-stem auger drill rig</u>		
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u>	LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>
								<b>DESCRIPTION/INTERPRETATION</b>		

0							GM	<u>FILL:</u> Brown, damp, loose, silty GRAVEL with sand and cobbles.
							SC	<u>ALLUVIUM:</u> Brown, damp, medium dense, clayey SAND.
	9						CL	Brown, damp, very stiff, sandy lean CLAY.
5							SM	Brown, damp, medium dense, silty SAND with clay; several clay layers a few inches thick; a few moderately hard, moderately cemented layers a few inches thick.
	36	18.0	107.2					Saturated.
								Dense.
10								Silty sand layer a few inches thick.
	64	24.9	101.5				CL/CH	Brown, saturated, very stiff, sandy lean to fat CLAY.
15							CL-ML	Brown, saturated, very stiff, silty CLAY; a few moderately hard, moderately cemented layers a few inches thick.
	48							
20								



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
301458002

DATE  
10/06

FIGURE  
A-72

DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/05/06</u>	BORING NO. <u>B-42</u>	
	Driven						GROUND ELEVATION <u>1,678.58'± MSL</u>	SHEET <u>2</u> OF <u>3</u>	
							METHOD OF DRILLING <u>CME-75 8-inch hollow-stem auger drill rig</u>		
							DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>	
							SAMPLED BY <u>RCH</u>	LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>
<b>DESCRIPTION/INTERPRETATION</b>									

20	50	30.7	91.2	CL/CH	<p><b>ALLUVIUM (continued):</b>          Reddish brown, saturated, very stiff, lean to fat CLAY; a few slightly cemented layers a few inches thick.</p>
25	7	⚡			Stiff.
30	50/5"	26.9	102.2	SP-SM	<p>Brown, saturated, very dense, poorly graded SAND; few gravel.          Sampler refusal after 11 inches.</p>
35	80			CL	<p>Brown, saturated, very stiff, sandy lean CLAY; few sand layers a few inches thick; a few moderately hard, moderately cemented layers a few inches thick.</p>
40					



<b>BORING LOG</b>		
GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE HENDERSON, NEVADA		
PROJECT NO. 301458002	DATE 10/06	FIGURE A-73

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.	
	Bulk	Driven						09/05/06	B-42	
								GROUND ELEVATION	SHEET	OF
								1,678.58'± MSL	3	3
								METHOD OF DRILLING		
								CME-75 8-inch hollow-stem auger drill rig		
								DRIVE WEIGHT	DROP	
								140 lbs. (auto trip hammer)	30"	
								SAMPLED BY	LOGGED BY	REVIEWED BY
								RCH	RCH	EDE
								<b>DESCRIPTION/INTERPRETATION</b>		
40			50/5"	21.9	105.0		SM	<b>ALLUVIUM (continued):</b> Brown, saturated, very dense, silty SAND. Sampler refusal after 11 inches.		
45			30				CL	Brown, saturated, very stiff, lean CLAY; a few moderately hard, moderately cemented layers a few inches thick.		
50			80/9"	31.2	92.3			Sampler refusal after 15 inches.  Layer of silty SAND a few inches thick. Total depth = 51.3 feet. Groundwater encountered at approximately 25.0 feet during drilling. Groundwater measured at approximately 7.8 feet 48 hours after drilling. Backfilled on 09/07/06.		
55										
60										



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
301458002

DATE  
10/06

FIGURE  
A-74

DEPTH (feet)	SAMPLES	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/05/06</u> BORING NO. <u>B-43</u>
							GROUND ELEVATION <u>1,679.04'± MSL</u> SHEET <u>1</u> OF <u>3</u>
Bulk Driven							METHOD OF DRILLING <u>CME-75 8-inch hollow-stem auger drill rig</u>
							DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u> DROP <u>30"</u>
							SAMPLED BY <u>RCH</u> LOGGED BY <u>RCH</u> REVIEWED BY <u>EDE</u>
<b>DESCRIPTION/INTERPRETATION</b>							

0					SM	<u>FILL:</u> Brown, damp, loose, silty SAND.
5	30				CL	<u>ALLUVIUM:</u> Brown, damp to moist, very stiff, sandy lean CLAY; highly gypsiferous; a few slightly cemented layers a few inches thick.
10	21				CL	Light brown to brown, moist, very stiff, lean CLAY.  Saturated.
15	47	24.9	99.3			A few slightly cemented layers a few inches thick; several silty sand layers a few inches thick.
20	22					



BORING LOG		
GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE HENDERSON, NEVADA		
PROJECT NO. 301458002	DATE 10/06	FIGURE A-75

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/05/06</u>	BORING NO. <u>B-43</u>	
	Bulk	Driven						GROUND ELEVATION <u>1,679.04± MSL</u>	SHEET <u>2</u> OF <u>3</u>	
								METHOD OF DRILLING <u>CME-75 8-inch hollow-stem auger drill rig</u>		
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u>	LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>
<b>DESCRIPTION/INTERPRETATION</b>										

20	45	27.1	98.0	SC	<p><b>ALLUVIUM (continued):</b> Brown, saturated, dense, clayey SAND; a few slightly sand layers a few inches thick; moderately gypsiferous.</p>
25	68/10"			SM	<p>Brown, saturated, very dense, silty SAND; a few moderately hard, moderately cemented layers a few inches thick. Sampler refusal after 16 inches.</p>
30	48	29.1	93.3	CL-ML	<p>Brown, saturated, very stiff, silty CLAY.</p>
35	13			CL	<p>Brown, saturated, stiff to very stiff, lean CLAY.</p>
40					



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
301458002

DATE  
10/06

FIGURE  
A-76

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.				
	Bulk	Driven						09/05/06	B-43				
								GROUND ELEVATION	SHEET	OF			
								1,679.04± MSL	3	3			
								METHOD OF DRILLING	CME-75 8-inch hollow-stem auger drill rig				
								DRIVE WEIGHT	140 lbs. (auto trip hammer)	DROP	30"		
								SAMPLED BY	RCH	LOGGED BY	RCH	REVIEWED BY	EDE
								<b>DESCRIPTION/INTERPRETATION</b>					
40			50/4"				SM	<b>ALLUVIUM (continued):</b> Brown, saturated, very dense, silty SAND. Sampler refusal after 10 inches.					
45			63/9"	38.6	79.0		CL	Brown, saturated, very stiff, lean CLAY. Sampler refusal after 15 inches.					
								Total depth = 46.3 feet. Groundwater encountered at approximately 23.0 feet during drilling. Groundwater measured at approximately 8.9 feet approximately 24 hours after drilling. Backfilled on 09/06/06.					
50													
55													
60													



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.	DATE	FIGURE
301458002	10/06	A-77

DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/05/06</u>	BORING NO. <u>B-44</u>	
	Driven						GROUND ELEVATION <u>1,678.96'± MSL</u>	SHEET <u>1</u> OF <u>3</u>	
							METHOD OF DRILLING <u>CME-75 8-inch hollow-stem auger drill rig</u>		
							DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>	
							SAMPLED BY <u>RCH</u>	LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>
<b>DESCRIPTION/INTERPRETATION</b>									

0						SM	<b>FILL:</b> Brown, damp, loose, silty SAND with gravel and cobbles.
						SM	<b>ALLUVIUM:</b> Brown, damp, medium dense, silty SAND.
15						SC	Brown, damp, medium dense, clayey SAND.
5		27	25.3	97.4		CH	Light reddish brown, moist, very stiff, sandy fat CLAY; highly gypsiferous; a few clayey sand and silty sand layers a few inches thick.  Saturated.
10		13				CL	Light reddish brown, moist, stiff to very stiff, sandy lean CLAY; highly gypsiferous; a few clayey sand and silty sand layers a few inches thick.  Very stiff.
15		25	29.6	91.5			
20							

# Ninyo & Moore

## BORING LOG

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
301458002

DATE  
10/06

FIGURE  
A-78

DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/05/06</u>	BORING NO. <u>B-44</u>	
	Driven						GROUND ELEVATION <u>1,678.96± MSL</u>	SHEET <u>2</u> OF <u>3</u>	
							METHOD OF DRILLING <u>CME-75 8-inch hollow-stem auger drill rig</u>		
							DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>	
							SAMPLED BY <u>RCH</u>	LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>
							<b>DESCRIPTION/INTERPRETATION</b>		

20	37			SM	<u>ALLUVIUM (continued):</u> Brown, saturated, dense, silty SAND; a few slightly cemented layers a few inches thick.
25	67	20.9	103.7	SC	Brown, saturated, dense, clayey SAND.
30	88			SP-SM	Brown, saturated, very dense, poorly graded SAND with silt.
35	32	19.2	98.5	CL	Brown, saturated, very stiff, lean CLAY.
40					



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
301458002

DATE  
10/06

FIGURE  
A-79

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/05/06</u> BORING NO. <u>B-44</u>	
	Bulk	Driven						GROUND ELEVATION <u>1,678.96± MSL</u>	SHEET <u>3</u> OF <u>3</u>
								METHOD OF DRILLING <u>CME-75 8-inch hollow-stem auger drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u> DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u> LOGGED BY <u>RCH</u> REVIEWED BY <u>EDE</u>	
								<b>DESCRIPTION/INTERPRETATION</b>	
40			67				SW-SM	<b>ALLUVIUM (continued):</b> Brown, saturated, very dense, well graded SAND with silt; few gravel; a few moderately hard, moderately cemented layers a few inches thick.	
45			92/10"	23.7	103.6		SC	Brown, saturated, very dense, clayey SAND; a few slightly cemented layers a few inches thick. Sampler refusal after 16 inches.	
50			52					Total depth = 51.5 feet. Groundwater encountered at approximately 30.0 feet during drilling. Groundwater measured at approximately 7.2 feet approximately 24 hours after drilling. Backfilled on 09/06/06.	
55									
60									

**Ninyo & Moore**

**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
301458002

DATE  
10/06

FIGURE  
A-80

DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/19/06</u>	BORING NO. <u>B-45</u>	
	Driven						GROUND ELEVATION <u>1,712.57± MSL</u>	SHEET <u>1</u> OF <u>3</u>	
							METHOD OF DRILLING <u>Mobile B-61 8-inch HDX hollow-stem auger drill rig</u>		
							DRIVE WEIGHT <u>140 lbs. (cathead)</u>	DROP <u>30"</u>	
							SAMPLED BY <u>RCH</u>	LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>
<b>DESCRIPTION/INTERPRETATION</b>									

0						GM	<u>FILL:</u> Brown, damp, medium dense, silty GRAVEL with sand and cobbles.	
						GM	<u>ALLUVIUM:</u> Brown, damp, dense, silty GRAVEL with sand, cobbles, and boulders.	
	46"					GP-GM	Brown, damp, very dense, poorly graded GRAVEL with silt, sand, and cobbles. Sampler refusal after 17 inches.	
5	74/11"	3.0	116.6			GP-GM	Brown, damp, very dense, poorly graded GRAVEL with silt, sand, and cobbles. Sampler refusal after 17 inches.	
						SW-SM	Brown, damp, very dense, well-graded SAND with silt, gravel, and cobbles.  Sampler refusal after 17 inches.	
10	77/11"					GP-GM	Sampler refusal after 9 inches. Brown, damp, very dense, poorly graded GRAVEL with silt, sand, and cobbles; a few moderately hard, moderately cemented layers a few inches thick. Sampler refusal after 9 inches.	
15	50/3"	4.7	107.4			GP-GM	Sampler refusal after 9 inches. Brown, damp, very dense, poorly graded GRAVEL with silt, sand, and cobbles; a few moderately hard, moderately cemented layers a few inches thick. Sampler refusal after 9 inches.	
						GP-GM	Sampler refusal after 2 inches.	
20	50/2"							

# Ninyo & Moore

## BORING LOG

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
301458002

DATE  
10/06

FIGURE  
A-81

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/19/06</u> BORING NO. <u>B-45</u>		
	Bulk	Driven						GROUND ELEVATION <u>1,712.57± MSL</u>	SHEET <u>2</u> OF <u>3</u>	METHOD OF DRILLING <u>Mobile B-61 8-inch HDX hollow-stem auger drill rig</u>
								DRIVE WEIGHT <u>140 lbs. (cathead)</u> DROP <u>30"</u>		
								SAMPLED BY <u>RCH</u> LOGGED BY <u>RCH</u> REVIEWED BY <u>EDE</u>		
								DESCRIPTION/INTERPRETATION		
20							GP-GM	<b>ALLUVIUM (continued):</b> Brown, damp, very dense, poorly graded GRAVEL with silt, sand, and cobbles; a few moderately hard, moderately cemented layers a few inches thick.		
							SW-SM	Brown, moist, very dense, well-graded SAND with silt and gravel.  Saturated; sampler refusal after 5 inches.		
25			50/5"	11				Saturated; sampler refusal after 5 inches.		
								Brown, saturated, moderately hard, CALICHE; moderately cemented; composed primarily of coarse-grained material. Very hard; strongly cemented.		
			50/2"					Sampler refusal after 2 inches.		
30								Sampler refusal after 2 inches.		
							SP-SM	Yellowish brown, saturated, very dense, poorly graded SAND with silt; a few clay layers a few inches thick.		
								Sampler refusal after 10 inches.		
40			50/4"	17.3	115.1			Sampler refusal after 10 inches.		



### BORING LOG

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
301458002

DATE  
10/06

FIGURE  
A-82

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/19/06</u> BORING NO. <u>B-45</u>	
	Bulk	Driven						GROUND ELEVATION <u>1,712.57± MSL</u>	SHEET <u>3</u> OF <u>3</u>
								METHOD OF DRILLING <u>Mobile B-61 8-inch HDX hollow-stem auger drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (cathead)</u> DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u> LOGGED BY <u>RCH</u> REVIEWED BY <u>EDE</u>	
								<b>DESCRIPTION/INTERPRETATION</b>	
40							SP-SM	NATIVE (continued): Yellowish brown, saturated, very dense, poorly graded SAND with silt; a few clay layers a few inches thick.	
45			100/11"				GP-GM	Brown, saturated, very dense, poorly graded GRAVEL with silt and sand (fine). Sampler refusal after 17 inches.	
50			73/10"	26.4	98.2		CL/CH	Reddish brown, saturated, very stiff, lean to fat CLAY.  Sampler refusal after 16 inches. Silty sand layer a few inches thick. Total depth = 50.3 feet. Groundwater encountered at approximately 24.0 feet during drilling. Hole caved to approximately 14.0 feet approximately 72 hours after drilling. Backfilled on 09/22/06.	
55								Note: Boring location approximately 195 feet west of NDOT Station No. 739+00.	
60									



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
301458002

DATE  
10/06

FIGURE  
A-83

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/22/06</u>	BORING NO. <u>B-46</u>	
	Bulk	Driven						GROUND ELEVATION <u>1,731.74± MSL</u>	SHEET <u>1</u> OF <u>3</u>	
								METHOD OF DRILLING <u>Mobile B-61 8-inch HDX hollow-stem auger drill rig</u>		
								DRIVE WEIGHT <u>140 lbs. (cathead)</u>	DROP <u>30"</u>	
								SAMPLED BY <u>NB</u>	LOGGED BY <u>NB</u>	REVIEWED BY <u>EDE</u>
<b>DESCRIPTION/INTERPRETATION</b>										

0							GP-GM	<u>FILL:</u> Brown, damp, dense, poorly graded GRAVEL with silt and sand.
		31						
5			98/11"	5.0	116.0			Sampler refusal after 17 inches; very dense.
							SW-SM	Brown, damp, very dense, well-graded SAND with silt and gravel.
							SP-SM	Brown, damp, very dense, poorly graded SAND with silt and gravel.
10			95/11"					Sampler refusal after 17 inches.
							GP-GM	Brown, damp, very dense, poorly graded GRAVEL with silt and sand.
15			50/5"	8.4	112.3			Sampler refusal after 11 inches.
							SP-SM	<u>ALLUVIUM:</u> Brown, damp, very dense, poorly graded SAND with silt and gravel.
20								



<b>BORING LOG</b>		
GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE HENDERSON, NEVADA		
PROJECT NO. 301458002	DATE 10/06	FIGURE A-84

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/22/06</u> BORING NO. <u>B-46</u>		
	Bulk	Driven						GROUND ELEVATION <u>1,731.74'± MSL</u>	SHEET <u>2</u> OF <u>3</u>	METHOD OF DRILLING <u>Mobile B-61 8-inch HDX hollow-stem auger drill rig</u>
								DRIVE WEIGHT <u>140 lbs. (cathead)</u>	DROP <u>30"</u>	
								SAMPLED BY <u>NB</u>	LOGGED BY <u>NB</u>	REVIEWED BY <u>EDE</u>
								<b>DESCRIPTION/INTERPRETATION</b>		
20			50/<1"					<b>ALLUVIUM (continued):</b> Brown, damp, hard, CALICHE; strongly cemented; coarse grained. Sampler refusal after <1 inch.		
							GP-GM	Brown, damp, very dense, poorly graded GRAVEL with silt and sand.		
								Brown, damp, hard, CALICHE; strongly cemented; coarse grained.		
25			50/5"	5.9	117.8		GP-GM	Brown, damp, very dense, poorly graded GRAVEL with silt and sand. Sampler refusal after 11 inches.		
								Brown, damp, moderately hard, CALICHE; moderately cemented; coarse grained. Sampler refusal after 11 inches.		
							GM	Brown, damp, very dense, silty GRAVEL with sand and cobbles.		
30								Medium dense.		
35			34	5.5	107.3			Medium dense.		
							SP-SM	Brown, damp, medium dense, poorly graded SAND with silt and gravel.		
40										



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
301458002

DATE  
10/06

FIGURE  
A-85



DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/07/06</u> BORING NO. <u>B-47</u>		
	Bulk	Driven						GROUND ELEVATION <u>1,711.68'± MSL</u>	SHEET <u>1</u> OF <u>3</u>	METHOD OF DRILLING <u>CME-75 8-inch hollow-stem auger drill rig</u>
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u>	LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>
<b>DESCRIPTION/INTERPRETATION</b>										
0							GP-GM	<b>FILL:</b> Brown, damp, dense, poorly-graded GRAVEL with silt, sand, and cobbles.		
			32	3.4	118.7		GP-GM	<b>ALLUVIUM:</b> Brown, damp, dense, poorly graded GRAVEL with silt, sand, and cobbles.		
5			45				SP-SM	Brown, damp, dense, poorly graded SAND with silt, gravel, and cobbles.		
							GP-GM	Brown, damp, dense, poorly graded GRAVEL with silt, sand, and cobbles.		
10			62				SP-SM	Brown, damp, very dense, poorly graded SAND with silt, gravel, and cobbles.		
							GP-GM	Brown, damp, very dense, poorly graded GRAVEL with silt, sand, and cobbles.		
15			58				SW-SM	Brown, damp, dense, well-graded SAND with silt, gravel, and cobbles.		
20										



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
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FIGURE  
A-87

DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/07/06</u>	BORING NO. <u>B-47</u>
	Driven						GROUND ELEVATION <u>1,711.68'± MSL</u>	SHEET <u>2</u> OF <u>3</u>
							METHOD OF DRILLING <u>CME-75 8-inch hollow-stem auger drill rig</u>	
							DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>
							SAMPLED BY <u>RCH</u> LOGGED BY <u>RCH</u> REVIEWED BY <u>EDE</u>	
<b>DESCRIPTION/INTERPRETATION</b>								

20		97	7.9	121.3	SW-SM	<p><b>ALLUVIUM (continued):</b> Brown, moist, very dense, well-graded SAND with silt, gravel, and cobbles.</p> <p>Slightly cemented.</p> <p>Saturated.</p> <p>Sampler refusal after 14 inches.</p>
25	93/8"					<p>Brown, saturated, very hard, CALICHE; strongly cemented; composed primarily of coarse-grained material.</p>
30	50/4"				SC	<p>Light brown, saturated, very dense, clayey SAND with gravel; slightly cemented.</p> <p>Sampler refusal after 4 inches.</p> <p>Brown, saturated, moderately hard, CALICHE; moderately cemented; composed primarily of coarse-grained material.</p>
35	39	28.6	91.2	CL	<p>Brown, saturated, very stiff, lean CLAY; few gravel; a few slightly cemented layers a few inches thick.</p>	
40						



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO. 301458002	DATE 10/06	FIGURE A-88
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DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/07/06</u> BORING NO. <u>B-47</u>		
	Bulk	Driven						GROUND ELEVATION <u>1,711.68'± MSL</u>	SHEET <u>3</u> OF <u>3</u>	METHOD OF DRILLING <u>CME-75 8-inch hollow-stem auger drill rig</u>
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u>	LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>
<b>DESCRIPTION/INTERPRETATION</b>										
40			17				CL	<u>ALLUVIUM (continued):</u> Brown, saturated, very stiff, lean CLAY; few gravel; a few slightly cemented layers a few inches thick.		
45			50/4"	24.8	100.8		SM	Brown, saturated, very dense, silty SAND. Sampler refusal after 10 inches.		
								Total depth = 45.8 feet. Groundwater encountered at approximately 24.0 feet during drilling. Groundwater measured at approximately 23.0 feet approximately 5 days after drilling. Backfilled on 09/12/06.		
								Note: Boring location approximately 150 feet east of NDOT Station No. 735+30.		
50										
55										
60										



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO. 301458002	DATE 10/06	FIGURE A-89
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DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/18/06</u>	BORING NO. <u>B-48</u>	
	Driven						SAMPLES	GROUND ELEVATION <u>1,726.16'± MSL</u>	SHEET <u>1</u> OF <u>3</u>
							METHOD OF DRILLING <u>Mobile B-61 8-inch HDX hollow-stem auger drill rig</u>		
							DRIVE WEIGHT <u>140 lbs. (cathead)</u>	DROP <u>30"</u>	
							SAMPLED BY <u>RCH</u>	LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>
<b>DESCRIPTION/INTERPRETATION</b>									

0						SM	<u>FILL:</u> Brown, damp, dense, silty SAND with gravel and cobbles.	
		47				SP-SM	Brown, damp, dense, poorly graded SAND with silt, gravel, and cobbles.	
5		50/3"	9.0	109.2		GW-GC	Brown, damp to moist, very dense, well-graded GRAVEL with clay, sand, and cobbles. Sampler refusal after 9 inches.	
10		90						
15		50/3"				GP-GM	<u>ALLUVIUM:</u> Brown, damp, very dense, poorly graded GRAVEL with silt, sand, and cobbles; a few hard, strongly cemented layers a few inches thick. Sampler refusal after 3 inches.	
						SW-SM	Brown, damp, very dense, well-graded SAND with silt, gravel, and cobbles.	
20								

# Ninyo & Moore

## BORING LOG

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
301458002

DATE  
10/06

FIGURE  
A-90

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/18/06</u>	BORING NO. <u>B-48</u>
	Bulk	Driven						GROUND ELEVATION <u>1,726.16± MSL</u>	SHEET <u>2</u> OF <u>3</u>
								METHOD OF DRILLING <u>Mobile B-61 8-inch HDX hollow-stem auger drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (cathead)</u>	DROP <u>30"</u>
								SAMPLED BY <u>RCH</u>	LOGGED BY <u>RCH</u> REVIEWED BY <u>EDE</u>
<b>DESCRIPTION/INTERPRETATION</b>									

20	50/2"					SW-SM	ALLUVIUM (continued): Brown, damp, very dense, well-graded SAND with silt, gravel, and cobbles; a few hard, strongly cemented layers a few inches thick.
						GP-GM	Sampler refusal after 2 inches. Brown, damp, very dense, poorly graded GRAVEL with silt, sand, and cobbles; slightly cemented; a few hard, strongly cemented layers a few inches thick.
25	50/3"						Sampler refusal after 3 inches.
							Brown, damp, very hard, CALICHE; strongly cemented; composed primarily of coarse-grained material.
						SW-SM	Brown, damp, very dense, well-graded SAND with silt and gravel; a few moderately hard moderately cemented layers a few inches thick.
30		76					
35	50/2"		4.9	113.7			Sampler refusal after 8 inches.
40							



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO. 301458002	DATE 10/06	FIGURE A-91
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DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.	
	Bulk	Driven						09/18/06	B-48	
								GROUND ELEVATION	SHEET	OF
								METHOD OF DRILLING		
								DRIVE WEIGHT	DROP	
								SAMPLED BY	LOGGED BY	REVIEWED BY
								<b>DESCRIPTION/INTERPRETATION</b>		
40			50/5"				SW-SM	<p><b>ALLUVIUM (continued):</b>            Brown, saturated, very dense, well-graded SAND with silt and gravel; a few moderately hard; moderately cemented layers a few inches thick.            Sampler refusal after 5 inches.</p>		
45			50/1					<p>Sampler refusal after 1 inch.            Total depth = 45.1 feet.            Groundwater encountered at approximately 40.0 feet during drilling.            Hole caved to approximately 20.0 feet approximately 72 hours after drilling.            Backfilled on 09/21/06.</p> <p>Note: Boring location approximately 110 feet west of NDOT Station No. 735+00 feet.</p>		
50										
55										
60										



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
 HENDERSON, NEVADA

PROJECT NO.  
 301458002

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 10/06

FIGURE  
 A-92

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/18/06</u>	BORING NO. <u>B-49</u>
	Bulk	Driven						GROUND ELEVATION <u>1,730.28± MSL</u>	SHEET <u>1</u> OF <u>3</u>
METHOD OF DRILLING <u>Mobile B-61 8-inch HDX hollow-stem auger drill rig</u>								DRIVE WEIGHT <u>140 lbs. (cathead)</u>	DROP <u>30"</u>
SAMPLED BY <u>RCH</u>								LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>
<b>DESCRIPTION/INTERPRETATION</b>									

0							GM	FILL: Brown, damp, dense, silty GRAVEL with sand and cobbles.	
							SM	Brown, damp, dense, silty SAND with gravel and cobbles.	
	87	4.9	114.1						
5									
	39								
10									
	60	8.1	129.0						
15							GM	Brown, damp, dense, silty GRAVEL with sand and cobbles.	
20									



BORING LOG		
GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE HENDERSON, NEVADA		
PROJECT NO. 301458002	DATE 10/06	FIGURE A-93

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/18/06</u>	BORING NO. <u>B-49</u>
	Bulk	Driven						GROUND ELEVATION <u>1,730.28± MSL</u>	SHEET <u>2</u> OF <u>3</u>
METHOD OF DRILLING <u>Mobile B-61 8-inch HDX hollow-stem auger drill rig</u>								DRIVE WEIGHT <u>140 lbs. (cathead)</u>	DROP <u>30"</u>
SAMPLED BY <u>RCH</u>								LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>
<b>DESCRIPTION/INTERPRETATION</b>									

20	X	50/4"				SW-SM	ALLUVIUM: Brown, damp, very dense, well-graded SAND with silt; gravel; and cobbles. Sampler refusal after 4 inches.
25						SP-SM	Brown, damp, medium dense to dense, poorly graded SAND with silt and gravel; highly gypsiferous.
30	X	50/5"				SW-SM	Brown, damp, very dense, well-graded SAND with silt, gravel, and cobbles; a few slightly cemented layers a few inches thick.  Sampler refusal after 5 inches.
35	X	50/3"					Sampler refusal after 3 inches.
40							



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO. 301458002	DATE 10/06	FIGURE A-94
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DEPTH (feet)	BULK SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.	
							09/18/06	B-49	
							GROUND ELEVATION	SHEET	OF
							1,730.28± MSL	3	3
							METHOD OF DRILLING		
							Mobile B-61 8-inch HDX hollow-stem auger drill rig		
							DRIVE WEIGHT	DROP	
							140 lbs. (cathead)	30"	
							SAMPLED BY	LOGGED BY	REVIEWED BY
							RCH	RCH	EDE
							<b>DESCRIPTION/INTERPRETATION</b>		
40	▲	38/6" 50/2"				SW-SM	<b>ALLUVIUM (continued):</b> Brown, damp, very dense, well-graded SAND with silt, gravel, and cobbles; a few slightly cemented layers a few inches thick. Sampler refusal after 8 inches.  Saturated.		
45	⊗	39/6" 50/1"					Sampler refusal after 7 inches.  Total depth = 45.6 feet. Groundwater encountered at approximately 41.9 feet during drilling. Hole caved to approximately 20.0 feet approximately 72 hours after drilling. Backfilled on 09/21/06.  Note: Boring location approximately 100 feet west of NDOT Station No. 736+00.		
50									
55									
60									



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

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10/06

FIGURE  
A-95

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/15/06</u>	BORING NO. <u>B-50</u>	
	Bulk	Driven						GROUND ELEVATION <u>1,711.21± MSL</u>	SHEET <u>1</u> OF <u>3</u>	
METHOD OF DRILLING <u>Mobile B-61 8-inch HDX hollow-stem auger drill rig</u>								DRIVE WEIGHT <u>140 lbs. (cathead)</u>		DROP <u>30"</u>
SAMPLED BY <u>RCH</u>								LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>	
<b>DESCRIPTION/INTERPRETATION</b>										

0							GM	FILL: Brown, damp, dense, silty GRAVEL with sand and cobbles.		
							SC-SM	ALLUVIUM: Brown, damp, very dense, clayey, silty SAND with gravel and cobbles.		
		76/11"	4.3	155.5				Sampler refusal after 17 inches.		
5							GP-GM	Brown, damp, dense, poorly graded GRAVEL with silt, sand, and cobbles.		
		65						Slightly cemented.		
10							SW-SM	Brown, damp, very dense, well-graded SAND with silt, gravel, and cobbles.		
		50						Medium dense.		
15								Saturated.		
		28	4.6	111.7						
20										



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
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FIGURE  
A-96

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/15/06</u>	BORING NO. <u>B-50</u>
	Bulk	Driven						GROUND ELEVATION <u>1,711.21± MSL</u>	SHEET <u>2</u> OF <u>3</u>
METHOD OF DRILLING <u>Mobile B-61 8-inch HDX hollow-stem auger drill rig</u>								DRIVE WEIGHT <u>140 lbs. (cathead)</u>	DROP <u>30"</u>
SAMPLED BY <u>RCH</u> LOGGED BY <u>RCH</u> REVIEWED BY <u>EDE</u>								<b>DESCRIPTION/INTERPRETATION</b>	

20	X	50/5"							
									Brown, saturated, very hard, CALICHE; strongly cemented; composed primarily of coarse-grained material.
25									
30									
									Hard.
									Sampler refusal after 1 inch.
35		50/<1"							Very hard.
									Moderately hard; moderately cemented.
									Sampler refusal after 5 inches.
		50/5"							
40							CL/CH		Brown, saturated, stiff, lean to fat CLAY.



**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

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FIGURE  
A-97

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/15/06</u> BORING NO. <u>B-50</u> GROUND ELEVATION <u>1,711.21± MSL</u> SHEET <u>3</u> OF <u>3</u> METHOD OF DRILLING <u>Mobile B-61 8-inch HDX hollow-stem auger drill rig</u> DRIVE WEIGHT <u>140 lbs. (cathead)</u> DROP <u>30"</u> SAMPLED BY <u>RCH</u> LOGGED BY <u>RCH</u> REVIEWED BY <u>EDE</u>		
	Bulk	Driven						DESCRIPTION/INTERPRETATION		
40			16	82.9	51.0		CL/CH	<b>ALLUVIUM (continued):</b> Brown, saturated, stiff, lean to fat CLAY.		
45			26				CL-ML	Reddish brown, saturated, very stiff, silty CLAY.		
50								Total depth = 46.5 feet. Groundwater encountered at approximately 20.0 feet during drilling. Groundwater measured at approximately 19.0 feet approximately 48 hours after drilling. Backfilled on 09/17/06.  Boring location approximately 140 feet east of NDOT Station No. 726+90.		
55										
60										

**Ninyo & Moore**

**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO. 301458002	DATE 10/06	FIGURE A-98
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DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/20/06</u> BORING NO. <u>B-51</u>		
	Bulk	Driven						GROUND ELEVATION <u>1,720.95'± MSL</u>	SHEET <u>1</u> OF <u>2</u>	METHOD OF DRILLING <u>Mobile B-61 8-inch HDX hollow-stem auger drill rig</u>
								DRIVE WEIGHT <u>140 lbs. (cathead)</u>	DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u>	LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>
<b>DESCRIPTION/INTERPRETATION</b>										
0							GM	FILL: Brown, damp, moist, silty GRAVEL with sand and cobbles.		
			80/9"	3.6	119.3		SW-SM	ALLUVIUM: Brown, damp, very dense, well-graded SAND with silt and gravel.		
5			96/10"				SP-SM	Brown, damp, very dense, poorly graded SAND with silt, gravel, and cobbles. Sampler refusal after 16 inches.		
10			50/2"	5.1	103.9		GP-GM	Brown, damp, very dense, poorly graded GRAVEL with silt, sand, and cobbles. Sampler refusal after 8 inches.		
15			50/2"				SW-SM	Brown, damp, very dense, well-graded SAND with silt, gravel, and cobbles. Sampler refusal after 2 inches.		
20										

# Ninyo & Moore

## BORING LOG

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
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DATE  
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FIGURE  
A-99

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/20/06</u> BORING NO. <u>B-51</u>		
	Bulk	Driven						GROUND ELEVATION <u>1,720.95'± MSL</u>	SHEET <u>2</u> OF <u>2</u>	METHOD OF DRILLING <u>Mobile B-61 8-inch HDX hollow-stem auger drill rig</u>
								DRIVE WEIGHT <u>140 lbs. (cathead)</u>	DROP <u>30"</u>	
								SAMPLED BY <u>RCH</u>	LOGGED BY <u>RCH</u>	REVIEWED BY <u>EDE</u>
<b>DESCRIPTION/INTERPRETATION</b>										
20			50/5"				Sw-SM	<b>ALLUVIUM (continued):</b> Brown, damp, very dense, well-graded SAND with silt, gravel, and cobbles. Sampler refusal after 5 inches.		
25			50/5"	⊥				Saturated; sampler refusal after 11 inches.  Brown, saturated, very hard, CALICHE; strongly cemented; composed primarily of coarse-grained material.		
30								Drill rig refusal. Total depth = 28.5 feet. Groundwater encountered at approximately 25.0 feet during drilling. Hole caved to approximately 8.0 feet approximately 48 hours after drilling. Backfilled on 09/22/06.		
35								Note: Boring location approximately 120 feet west of NDOT Station No. 727+45.		
40										

**Ninyo & Moore**

**BORING LOG**

GALLERIA DRIVE INTERCHANGE, INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO. 301458002	DATE 10/06	FIGURE A-100
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# APPENDIX B

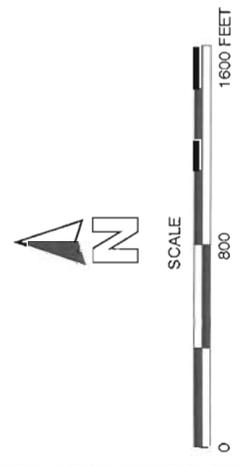
I-515 from Galleria Drive to West Sunset Road



**LEGEND**

-  **B-58** Approximate location of exploratory boring.  
TD=15.1 TD indicates total depth of exploratory boring, in feet.
-  **R-11** Approximate location of field resistivity test.

REFERENCE: Google Earth.  
NOTE: Dimensions, directions, and locations are approximate.



**Ninyo & Moore**

**EXPLORATORY BORING LOCATIONS MAP**

24-INCH REUSE WATERLINE  
GALLERIA DRIVE INTERCHANGE  
INTERSTATE 515 AND GALLERIA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
301458003

DATE  
02/07

FIGURE

**2**

DEPTH (feet)	SAMPLES		BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>01/31/07</u> BORING NO. <u>B-52</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>Mobile B-61 HDX hollow-stem auger drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u> DROP <u>30"</u>	
								SAMPLED BY <u>NB</u> LOGGED BY <u>NB</u> REVIEWED BY <u>EDE</u>	
<b>DESCRIPTION/INTERPRETATION</b>									
0							GM	ASPHALT CONCRETE: Approximately 4-1/2 inches thick.	
							SM	FILL: Dark brown, damp, dense, silty GRAVEL with sand (aggregate base material) ; unit is approximately 7-1/2 inches thick.	
								NATIVE SOIL: Dark brown, damp, very dense, silty SAND with gravel and cobbles.	
5									
10									Medium dense.
15									Very dense; sampler refusal after 3 inches. Total depth = 15.2 feet. Groundwater not encountered during drilling. Backfilled and patched on 01/31/07.
20									NOTE: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.



**BORING LOG**

24-INCH REUSE WATER LINE, GALLERIA DRIVE INTERCHANGE  
HENDERSON, NEVADA

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FIGURE  
5

DEPTH (feet)	SAMPLES		BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>01/31/07</u> BORING NO. <u>B-53</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>Mobile B-61 HDX hollow-stem auger drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u> DROP <u>30"</u>	
								SAMPLED BY <u>NB</u> LOGGED BY <u>NB</u> REVIEWED BY <u>EDE</u>	
								<b>DESCRIPTION/INTERPRETATION</b>	
0							GM	<u>ASPHALT CONCRETE:</u> Approximately 4-1/2 to 4-3/4 inches thick.	
							SM	<u>FILL:</u> Dark brown, damp, dense, silty GRAVEL with sand (aggregate base material) ; unit is approximately 7-1/2 to 8 inches thick.	
								<u>NATIVE SOIL:</u> Dark brown, damp, very dense, silty SAND with gravel and cobbles.	
5			28/6" 43/6" 35/6"	5.0	116.8			Increase in gravel content.	
15			28/6" 50/3"					Sampler refusal after 9 inches. Total depth = 15.8 feet. Groundwater encountered at approximately 14.5 feet during drilling. Backfilled and patched on 01/31/07.	
20								NOTE: Groundwater may rise to a level higher than that measured in borehole due to seasonal variations in precipitation and several other factors as discussed in the report.	



**BORING LOG**

24-INCH REUSE WATER LINE, GALLERIA DRIVE INTERCHANGE  
HENDERSON, NEVADA

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FIGURE  
6

DEPTH (feet)	SAMPLES		BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>01/31/07</u> BORING NO. <u>B-54</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>Mobile B-61 HDX hollow-stem auger drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u> DROP <u>30"</u>	
								SAMPLED BY <u>NB</u> LOGGED BY <u>NB</u> REVIEWED BY <u>EDE</u>	
<b>DESCRIPTION/INTERPRETATION</b>									
0							GM	ASPHALT CONCRETE: Approximately 4-1/2 inches thick.	
							GM	FILL: Dark brown, damp, medium dense, silty GRAVEL (aggregate base); unit is approximately 7-1/2 inches thick.	
								NATIVE SOIL: Dark brown, damp, dense, silty GRAVEL with sand and cobbles.	
5			39/6" 50/3"					Very dense; sampler refusal after 9 inches.	
10			7/6" 10/6" 35/6"	12.0	115.4		SM	Dark brown, damp, very dense, silty SAND with gravel and cobbles.  Dense.	
15			50/3"					Very dense; sampler refusal after 3 inches.	
20								Total depth = 15.2 feet. Groundwater encountered at approximately 14.5 feet during drilling. Backfilled and patched on 01/31/07.	
								NOTE: Groundwater may rise to a level higher than that measured in borehole due to seasonal variations in precipitation and several other factors as discussed in the report.	



**BORING LOG**

24-INCH REUSE WATER LINE, GALLERIA DRIVE INTERCHANGE  
HENDERSON, NEVADA

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FIGURE  
7

DEPTH (feet)	SAMPLES		BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>01/31/07</u> BORING NO. <u>B-55</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>Mobile B-61 HDX hollow-stem auger drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u> DROP <u>30"</u>	
								SAMPLED BY <u>NB</u> LOGGED BY <u>NB</u> REVIEWED BY <u>EDE</u>	
								<b>DESCRIPTION/INTERPRETATION</b>	
0							GM	ASPHALT CONCRETE: Approximately 3 to 3-1/2 inches thick.	
							GM	FILL: Dark brown, damp, medium dense, silty GRAVEL with sand (aggregate base material); unit is approximately 7 inches thick.	
								NATIVE SOIL: Dark brown, damp, very dense, silty GRAVEL with sand and cobbles.	
5			23/6" 50/5"					Sampler refusal after 11 inches.	
10			10/6" 50/1"				SM	Dark brown, damp, very dense, silty SAND with gravel and cobbles. Sampler refusal after 7 inches.	
15			12/6" 35/6" 33/6"	20.5	107.6		CL	Dark brown, damp, very stiff, sandy lean CLAY.	
								Total depth = 16.5 feet. Groundwater not encountered during drilling. Backfilled and patched on 01/31/07.	
								NOTE: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.	
20									



**BORING LOG**

24-INCH REUSE WATER LINE, GALLERIA DRIVE INTERCHANGE  
HENDERSON, NEVADA

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FIGURE  
8

DEPTH (feet)	SAMPLES		BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>01/31/07</u> BORING NO. <u>B-56</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>Mobile B-61 HDX hollow-stem auger drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u> DROP <u>30"</u>	
								SAMPLED BY <u>NB</u> LOGGED BY <u>NB</u> REVIEWED BY <u>EDE</u>	
<b>DESCRIPTION/INTERPRETATION</b>									
0							GM	ASPHALT CONCRETE: Approximately 3-1/2 inches thick.	
							GM	FILL: Dark brown, damp, medium dense, silty GRAVEL with sand (aggregate base material); unit is approximately 8 to 8-3/4 inches thick.	
								NATIVE SOIL: Dark brown, damp, medium dense, silty GRAVEL with sand.	
5			9/6" 8/6" 10/6"	6.0	107.0				
10			5/6" 4/6" 5/6"	7.5	98.7		SM	Dark brown, damp, loose, silty SAND with gravel.	
15			4/6" 4/6" 8/6"	31.0	77.2		CL	Dark brown, damp, stiff, sandy lean CLAY.	
								Total depth = 16.5 feet. Groundwater not encountered during drilling. Backfilled and patched on 01/31/07.	
								NOTE: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.	
20									



**BORING LOG**

24-INCH REUSE WATER LINE, GALLERIA DRIVE INTERCHANGE  
HENDERSON, NEVADA

PROJECT NO.  
301458003

DATE  
02/07

FIGURE  
9

DEPTH (feet)	SAMPLES		BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>01/31/07</u> BORING NO. <u>B-57</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>Mobile B-61 HDX hollow-stem auger drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u> DROP <u>30"</u>	
								SAMPLED BY <u>NB</u> LOGGED BY <u>NB</u> REVIEWED BY <u>EDE</u>	
								<b>DESCRIPTION/INTERPRETATION</b>	
0							GM	<u>ASPHALT CONCRETE:</u> Approximately 2 to 2-1/2 inches thick.	
							GM	<u>FILL:</u> Dark brown, damp, dense, silty GRAVEL with sand (aggregate base material); unit is approximately 8 to 8-1/2 inches thick.	
								<u>NATIVE SOIL:</u> Dark brown, damp, very dense, silty GRAVEL with sand, cobbles, and boulders.	
5			25/6" 50/1"					Sampler refusal after 7 inches.	
15			50/4"					Sampler refusal after 4 inches.	
20								Total depth = 15.3 feet. Groundwater not encountered during drilling. Backfilled and patched on 01/31/07.	
								NOTE: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.	



**BORING LOG**

24-INCH REUSE WATER LINE, GALLERIA DRIVE INTERCHANGE  
HENDERSON, NEVADA

PROJECT NO.  
301458003

DATE  
02/07

FIGURE  
10

DEPTH (feet)	SAMPLES		BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>01/31/07</u> BORING NO. <u>B-58</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>Mobile B-61 HDX hollow-stem auger drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u> DROP <u>30"</u>	
								SAMPLED BY <u>NB</u> LOGGED BY <u>NB</u> REVIEWED BY <u>EDE</u>	
								<b>DESCRIPTION/INTERPRETATION</b>	
0							GM	NATIVE SOIL: Brown, damp, medium dense, silty GRAVEL with sand and cobbles.	
							GP-GM	Brown, damp, medium dense, poorly graded GRAVEL with silt and sand.	
5			7/6" 8/6" 10/6"	5.5	106.9				
10			10/6" 10/6" 9/6"						
15			50/1"					Very dense; sampler refusal after 1 inch. Total depth = 15.1 feet. Groundwater not encountered during drilling. Backfilled on 01/31/07.	
20								NOTE: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.	



**BORING LOG**

24-INCH REUSE WATER LINE, GALLERIA DRIVE INTERCHANGE  
HENDERSON, NEVADA

PROJECT NO.  
301458003

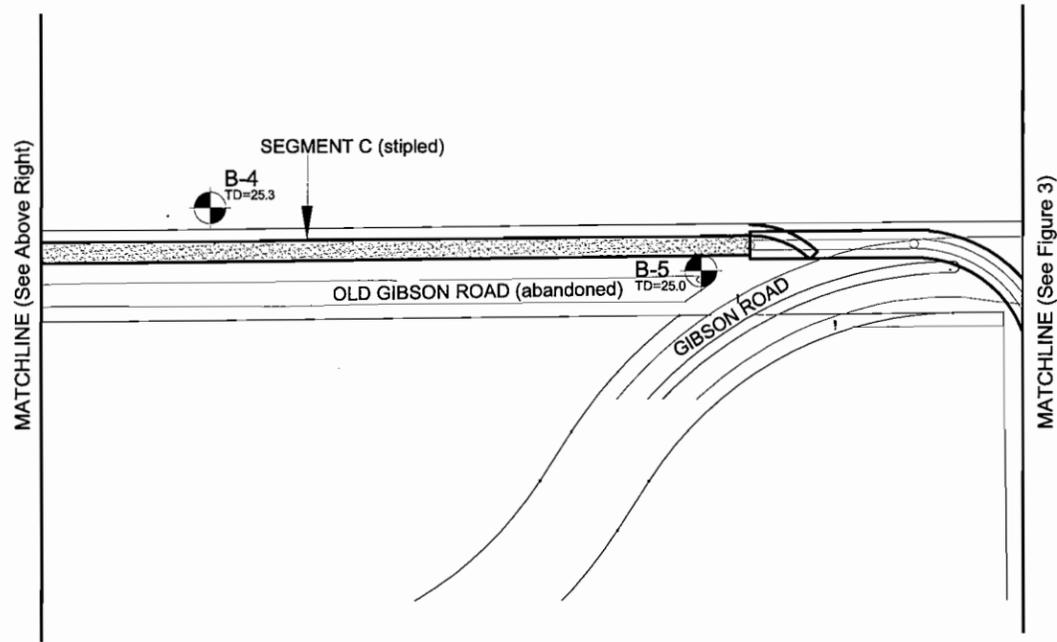
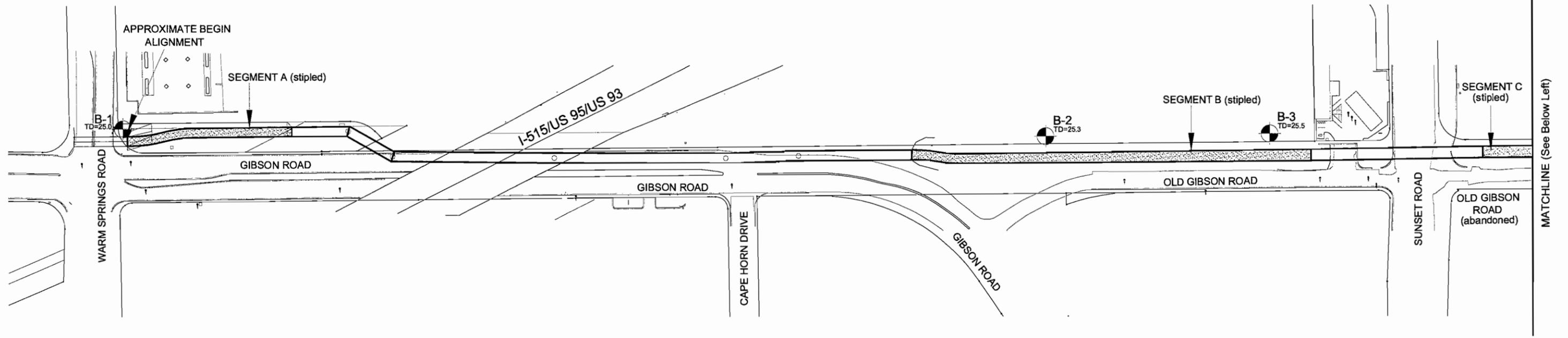
DATE  
02/07

FIGURE  
11



# APPENDIX C

## I-515 Near Gibson Road



**DRAFT**



**LEGEND**  
 B-6  
 TD=24.0  
 Approximate location of exploratory boring.  
 TD indicates approximate total depth of exploratory boring, in feet.

REFERENCE: City of Henderson, undated, untitled site plan for Gibson Conveyance System project.  
 NOTE: Dimensions and directions are approximate.



**BORING LOCATION MAP**  
 GIBSON CONVEYANCE SYSTEM  
 SEGMENT A THROUGH SEGMENT D  
 HENDERSON, NEVADA

PROJECT NO. 301344001	DATE 11/2003	FIGURE 2
--------------------------	-----------------	-------------

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>10/17/2003</u> BORING NO. <u>B-1</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>2</u>
								METHOD OF DRILLING <u>Truck-mounted Mobile B-80 air-rotary drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (Spooling cable)</u> DROP <u>30"</u>	
								SAMPLED BY <u>DJD</u> LOGGED BY <u>DJD</u> REVIEWED BY <u>BDB</u>	
								<b>DESCRIPTION/INTERPRETATION</b>	
0							SM	<b>FILL:</b> Light brown, damp, very dense, silty fine to medium SAND with gravel and cobbles. Sampler refusal after 5".  Medium dense; highly gypsiferous.	
5			32	5.4	102.4				
10			50/3"				SP-SM	<b>ALLUVIUM:</b> Dark reddish brown, damp, very dense, poorly graded fine to coarse SAND with silt, fine gravel, cobbles, and boulders; slightly cemented.  Sampler refusal after 3".  No cementation.	
15			50/5"					Sampler refusal after 5".  Saturated.	
20			32				CL	Reddish brown, saturated, very stiff, sandy lean CLAY with gravel.	

DRAFT



<b>BORING LOG</b>		
Gibson Conveyance System, Segment A through Segment D Henderson, Nevada		
PROJECT NO. 301344001	DATE 11/2003	FIGURE A-1

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>10/17/2003</u> BORING NO. <u>B-1</u> GROUND ELEVATION <u>Not measured</u> SHEET <u>2</u> OF <u>2</u> METHOD OF DRILLING <u>Truck-mounted Mobile B-80 air-rotary drill rig</u> DRIVE WEIGHT <u>140 lbs. (Spooling cable)</u> DROP <u>30"</u> SAMPLED BY <u>DJD</u> LOGGED BY <u>DJD</u> REVIEWED BY <u>BDB</u>		
	Bulk	Driven						DESCRIPTION/INTERPRETATION		
20							CL	<u>ALLUVIUM (continued):</u> Reddish brown, saturated, very stiff, sandy lean CLAY with gravel.		
25			50/6"	30.0	92.6			Sampler refusal after 12". Total depth = 25.0 feet. Groundwater measured at 15.6 feet approximately 15 minutes after drilling. Backfilled on 10/17/2003.		
30								<h1>DRAFT</h1>		
35										
40										



**BORING LOG**

Gibson Conveyance System, Segment A through Segment D  
Henderson, Nevada

PROJECT NO.  
301344001

DATE  
11/2003

FIGURE  
A-2

DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>10/17/2003</u>	BORING NO. <u>B-2</u>
	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>2</u>
							METHOD OF DRILLING <u>Truck-mounted Mobile B-80 air-rotary drill rig</u>	
							DRIVE WEIGHT <u>140 lbs. (Spooling cable)</u>	DROP <u>30"</u>
							SAMPLED BY <u>DJD</u> LOGGED BY <u>DJD</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>								

0						SP-SM	<p><b>ALLUVIUM:</b> Light brown, dry, very dense, poorly graded fine to coarse SAND with silt, gravel, cobbles, and boulders.</p> <p>Reddish brown; damp.</p> <p>Dense.</p>
5	52	33					
10	49						
15	50/<1"						<p>Sampler refusal after 6".</p> <p>Light brown, damp, very hard, CALICHE; strongly cemented; composed primarily of fine-grained materials.</p>
20	70/7"	30.3	90.2		CL		<p>Reddish brown, moist, very stiff, lean CLAY; slightly gypsiferous.</p> <p>Sampler refusal after 13".</p>

DRAFT



BORING LOG		
Gibson Conveyance System, Segment A through Segment D Henderson, Nevada		
PROJECT NO. 301344001	DATE 11/2003	FIGURE A-3

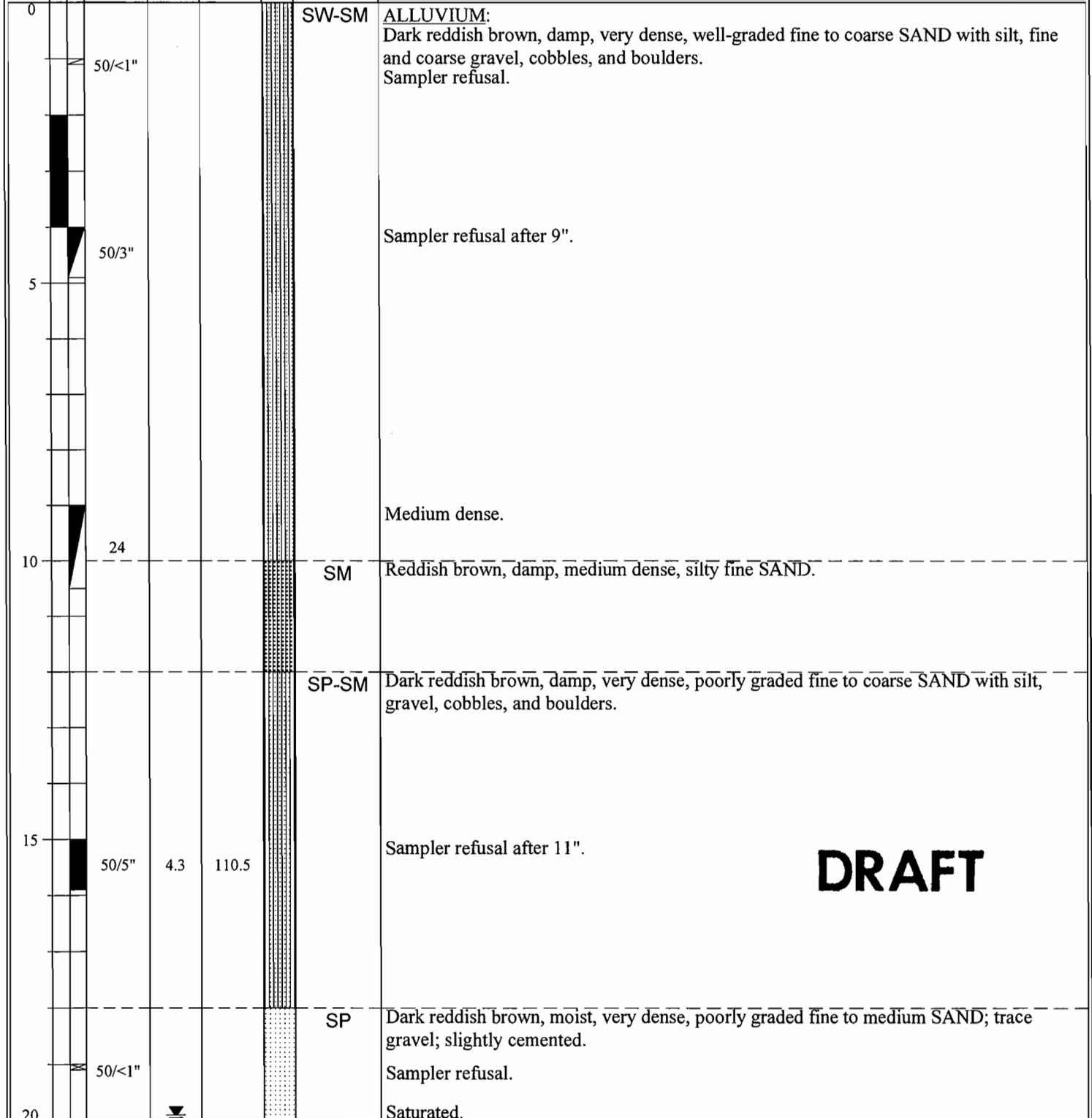
DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>10/17/2003</u> BORING NO. <u>B-2</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>2</u> OF <u>2</u>
								METHOD OF DRILLING <u>Truck-mounted Mobile B-80 air-rotary drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (Spooling cable)</u> DROP <u>30"</u>	
								SAMPLED BY <u>DJD</u> LOGGED BY <u>DJD</u> REVIEWED BY <u>BDB</u>	
								<b>DESCRIPTION/INTERPRETATION</b>	
20								<p><u>ALLUVIUM (continued):</u>            Pale brown, moist, very hard, CALICHE; strongly cemented; composed primarily of fine-grained materials.            Reddish brown, moist, very stiff, lean CLAY; trace gravel; slightly gypsiferous; scattered thin layers of very hard, strongly cemented, fine-grained caliche.            Saturated.</p>	
25			72/10"	29.6	86.8		CL	<p>Sampler refusal after 16".</p>	
30								<p>Total depth = 25.3 feet.            Groundwater encountered at approximately 22 feet during drilling and measured at 23.5 feet approximately 15 minutes after drilling.            Backfilled on 10/17/2003.</p>	
35									
40									

DRAFT



<b>BORING LOG</b>		
Gibson Conveyance System, Segment A through Segment D Henderson, Nevada		
PROJECT NO. 301344001	DATE 11/2003	FIGURE A-4

DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>10/17/2003</u>	BORING NO. <u>B-3</u>	
	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>2</u>	
							METHOD OF DRILLING <u>Truck-mounted Mobile B-80 air-rotary drill rig</u>		
							DRIVE WEIGHT <u>140 lbs (Spooling cable)</u>	DROP <u>30"</u>	
							SAMPLED BY <u>DJD</u>	LOGGED BY <u>DJD</u>	REVIEWED BY <u>BDB</u>
<b>DESCRIPTION/INTERPRETATION</b>									



**Ninyo & Moore**

**BORING LOG**

Gibson Conveyance System, Segment A through Segment D  
Henderson, Nevada

PROJECT NO.  
301344001

DATE  
11/2003

FIGURE  
A-5

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>10/17/2003</u> BORING NO. <u>B-3</u>		
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>2</u> OF <u>2</u>	METHOD OF DRILLING <u>Truck-mounted Mobile B-80 air-rotary drill rig</u>
								DRIVE WEIGHT <u>140 lbs (Spooling cable)</u>	DROP <u>30"</u>	SAMPLED BY <u>DJD</u> LOGGED BY <u>DJD</u> REVIEWED BY <u>BDB</u>
								<b>DESCRIPTION/INTERPRETATION</b>		
20							SP	<p><b>ALLUVIUM (continued):</b>            Dark reddish brown, saturated, very dense, poorly graded fine to medium SAND; trace gravel; slightly cemented.            Dark reddish brown to black, saturated, very hard, CALICHE; strongly cemented; composed primarily of coarse-grained materials.</p> <p>Hard.</p>		
25			32				SP-SM	<p>Dark reddish brown, saturated, dense, poorly graded fine to coarse SAND with silt and gravel.</p>		
								<p>Total depth = 25.5 feet.            Groundwater measured at 19.9 feet approximately 15 minutes after drilling.            Backfilled on 10/17/2003.</p>		
30								<b>DRAFT</b>		
35										
40										



**BORING LOG**

Gibson Conveyance System, Segment A through Segment D  
 Henderson, Nevada

PROJECT NO.  
301344001

DATE  
11/2003

FIGURE  
A-6

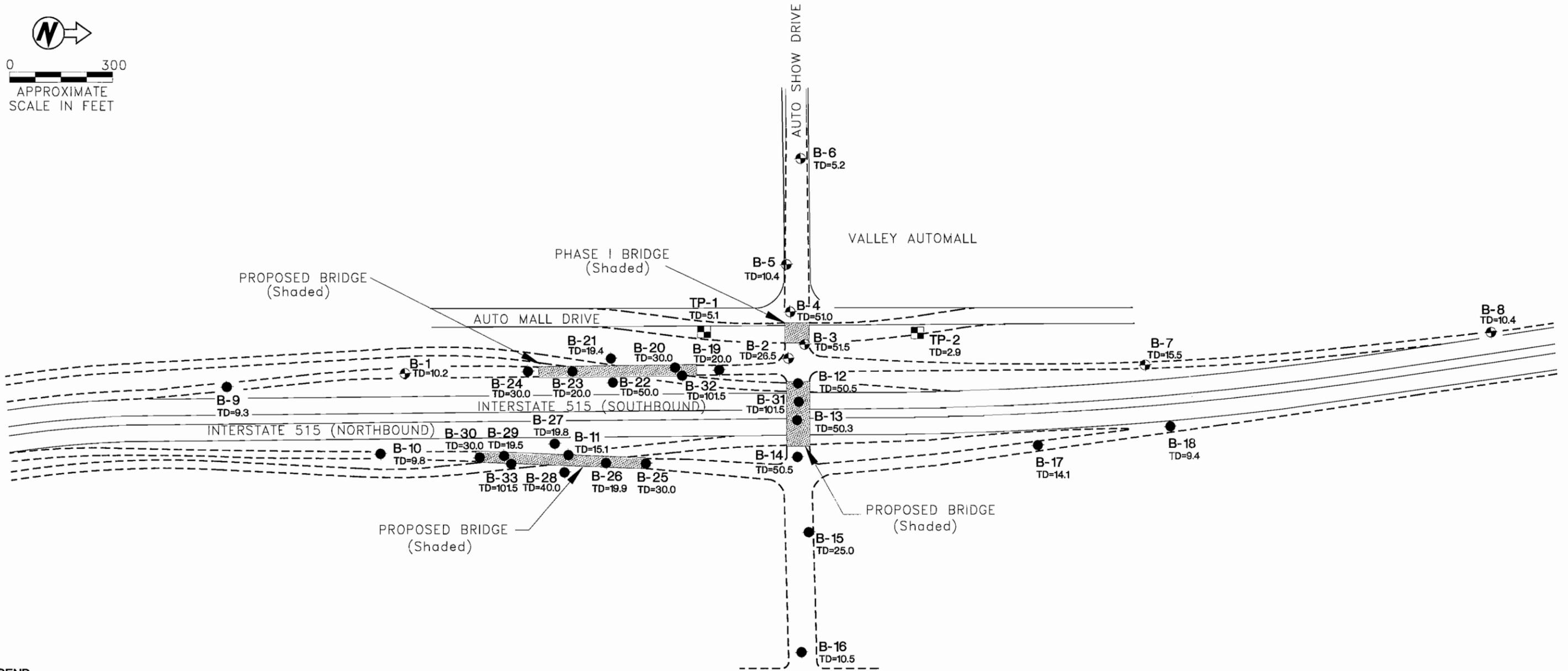


# APPENDIX D

## I-515 Near Auto Show Mall



0 300  
 APPROXIMATE  
 SCALE IN FEET



**LEGEND**

- Proposed bridge.
- Existing roadway.
- Proposed roadway.
- B-8  
TD=10.4  
Approximate location of exploratory boring (borings B-1 through B-8) performed for Phase I (logs of these borings were presented in our referenced report for Phase I). TD indicates total depth of boring, in feet.
- B-33  
TD=101.5  
Approximate location of exploratory boring (borings B-9 through B-33) performed for Phase II. TD indicates total depth of boring, in feet.
- TP-2  
TD=2.9  
Approximate location of exploratory test pit performed for Phase I (logs of these test pits were presented in our referenced report for Phase I). TD indicates total depth of test pit, in feet.

REFERENCE: PBS&J, 2000, I-515/Automall Interchange Construction Plans: dated November 15.

NOTE: All dimensions and directions are approximate.

**Ninyo & Moore**

**SUBSURFACE EXPLORATION  
 LOCATION MAP**

AUTO SHOW DRIVE INTERCHANGE, PHASE II  
 INTERSTATE 515 and AUTO SHOW DRIVE  
 HENDERSON, NEVADA

PROJECT NO. 300623001	DATE 09/2003	FIGURE 2
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DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.	
	Bulk	Driven						07/18/2001	B-9	
								GROUND ELEVATION	SHEET	OF
								Not measured	1	1
								METHOD OF DRILLING	Air rotary, 6" diameter bit	
								DRIVE WEIGHT	See "Notes"	DROP
										30"
								SAMPLED BY	BOM	LOGGED BY
									BOM	REVIEWED BY
										BDB
<b>DESCRIPTION/INTERPRETATION</b>										
0							SM	<b>ALLUVIUM:</b> Brown, damp, dense to very dense, silty fine to coarse SAND with gravel and cobbles; slightly gypsiferous.		
5			60					Sampler refusal after 6".		
			50/6"					Sampler refusal after 4".		
			50/4"					Total Depth = 9.3 feet.		
10								Groundwater not encountered during drilling.		
								Backfilled on 07/18/2001.		
								Notes:		
								Standard Penetration Test (SPT) samples were obtained with a 140-lb hammer. Modified split-barrel (MSB) drive samples were obtained with a 340-lb hammer.		
								Boring located approximately 115 feet west of NDOT I-515 Station No. 644+05.		
15										
20										



**BORING LOG**

Auto Show Drive Interchange, Phase II  
Henderson, Nevada

PROJECT NO.  
300623001

DATE  
09/2003

FIGURE  
A-1

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>07/19/2001</u> BORING NO. <u>B-10</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>Air rotary, 6" diameter bit</u>	
								DRIVE WEIGHT <u>See "Notes"</u> DROP <u>30"</u>	
								SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>									
0							SM	ALLUVIUM: Brown, damp, dense to very dense, silty fine to coarse SAND with gravel and cobbles.	
			88				SP	Brown, damp, very dense, poorly graded SAND with gravel and cobbles and small boulders.	
5							GP-GM	Brown, damp, very dense, poorly graded GRAVEL with silt and sand and cobbles.	
			60	7.9	111.4			Sampler refusal after 10".	
			40/6" 50/4"					Total Depth = 9.8 feet. Groundwater not encountered during drilling. Backfilled on 07/19/2001.	
10								Notes: Standard Penetration Test (SPT) samples were obtained with a 140-lb hammer. Modified split-barrel (MSB) drive samples were obtained with a 340-lb hammer.	
								Boring located approximately 110 feet east of NDOT I-515 Station No. 646+15.	
15									
20									



**BORING LOG**

Auto Show Drive Interchange, Phase II  
Henderson, Nevada

PROJECT NO.  
300623001

DATE  
09/2003

FIGURE  
A-2

DEPTH (feet)	Bulk Samples Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>07/19/2001</u> BORING NO. <u>B-11</u>
							GROUND ELEVATION <u>Not measured</u> SHEET <u>1</u> OF <u>1</u>
							METHOD OF DRILLING <u>Air rotary, 6" diameter bit</u>
							DRIVE WEIGHT <u>See "Notes"</u> DROP <u>30"</u>
							SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>

DEPTH (feet)		BLOWS/FOOT		MOISTURE (%)		DRY DENSITY (PCF)		SYMBOL		CLASSIFICATION U.S.C.S.		DESCRIPTION/INTERPRETATION	
0										GM	<b>ALLUVIUM:</b> Brown, damp, dense to very dense, silty fine and coarse GRAVEL with sand and cobbles and small boulders.		
5		38									Sampler refusal after 5".		
10		40/6" 50/6"	5.8	128.4							Sampler refusal after 12".		
15		50/1"									Sampler refusal after 1". Total Depth = 15.1 feet. Groundwater not encountered during drilling. Backfilled on 07/19/2001.		
20											Notes: Standard Penetration Test (SPT) samples were obtained with a 140-lb hammer. Modified split-barrel (MSB) drive samples were obtained with a 340-lb hammer.		
												Boring located approximately 120 feet east of NDOT I-515 Station No. 652+00.	



BORING LOG		
Auto Show Drive Interchange, Phase II Henderson, Nevada		
PROJECT NO. 300623001	DATE 09/2003	FIGURE A-3

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>07/18/2001</u>	BORING NO. <u>B-12</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>3</u>	
								METHOD OF DRILLING <u>Air rotary, 6" diameter bit</u>		
								DRIVE WEIGHT <u>See "Notes"</u>	DROP <u>30"</u>	
								SAMPLED BY <u>BOM</u>	LOGGED BY <u>BOM</u>	REVIEWED BY <u>BDB</u>
<b>DESCRIPTION/INTERPRETATION</b>										

0	15	5	10	15	20		GW-GM <b>ALLUVIUM:</b> Brown, damp, dense to very dense, well-graded GRAVEL with silt and sand and cobbles and small boulders; slightly gypsiferous.	10.1	121.3	<p>Sampler refusal.</p> <p>Sampler refusal after 12".</p> <p>Sampler refusal after 10".</p> <p>Sampler refusal after 12".</p> <p>Sampler refusal after 12".</p>
	15/<1"									
	35/6"									
	23/6" 50/4"									
	25/6" 50/6"									
	43/6" 50/6"									



<b>BORING LOG</b>		
Auto Show Drive Interchange, Phase II Henderson, Nevada		
PROJECT NO. 300623001	DATE 09/2003	FIGURE A-4

DEPTH (feet)	Bulk Driven	SAMPLES	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>07/18/2001</u> BORING NO. <u>B-12</u>
								GROUND ELEVATION <u>Not measured</u> SHEET <u>2</u> OF <u>3</u>
								METHOD OF DRILLING <u>Air rotary, 6" diameter bit</u>
								DRIVE WEIGHT <u>See "Notes"</u> DROP <u>30"</u>
								SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>
<b>DESCRIPTION/INTERPRETATION</b>								

20	27/6" 45/6"	7.6	127.2	GW-GM	<p><b>ALLUVIUM (continued):</b> Brown, damp to moist, dense to very dense, well-graded GRAVEL with silt and sand and cobbles and small boulders; slightly gypsiferous.</p> <p>Sampler refusal after 12".</p>	
25	50/5"				<p>Sampler refusal after 5".</p>	
30					<p>Brown, damp, moderately hard, CALICHE; moderately cemented; composed primarily of coarse-grained material.</p>	
				SP-SM	<p>Brown, moist, dense to very dense, poorly graded fine to coarse SAND with silt and gravel.</p>	
35		43	17.5	93.6	SM	<p>Light brown, damp to moist, dense, silty fine to medium SAND.</p>
40	50/6"			SC	<p>Light brown, moist, dense to very dense, clayey fine to medium SAND; trace gravel.</p> <p>Sampler refusal after 6".</p>	



<b>BORING LOG</b>		
Auto Show Drive Interchange, Phase II Henderson, Nevada		
PROJECT NO. 300623001	DATE 09/2003	FIGURE A-5

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.
	Bulk	Driven						07/18/2001	B-12
								GROUND ELEVATION	SHEET
								Not measured	3 OF 3
								METHOD OF DRILLING	
								Air rotary, 6" diameter bit	
								DRIVE WEIGHT	DROP
								See "Notes"	30"
								SAMPLED BY	LOGGED BY
								BOM	BOM
								REVIEWED BY	
								BDB	
<b>DESCRIPTION/INTERPRETATION</b>									
40								<u>ALLUVIUM (continued):</u> Light brown, damp, moderately hard to hard, CALICHE; moderately to strongly cemented; composed primarily of fine-grained material.	
45			19	20.0	98.9		SC	Brown, saturated, medium dense, clayey fine to coarse SAND; trace fine gravel.	
50			21				CL	Brown, saturated, very stiff, lean CLAY; trace fine sand; trace gravel.	
55								Total Depth = 50.5 feet. Groundwater measured at 43.7 feet approximately 6 days after drilling. Backfilled on 07/24/2001.	
60								Notes: Standard Penetration Test (SPT) samples were obtained with a 140-lb hammer. Modified split-barrel (MSB) drive samples were obtained with a 340-lb hammer.	
								Boring located approximately 95 feet west of NDOT I-515 Station No. 658+30.	



<b>BORING LOG</b>		
Auto Show Drive Interchange, Phase II Henderson, Nevada		
PROJECT NO. 300623001	DATE 09/2003	FIGURE A-6

DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>07/19/2001</u>	BORING NO. <u>B-13</u>
	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>3</u>
							METHOD OF DRILLING <u>Air rotary, 6" diameter bit</u>	
							DRIVE WEIGHT <u>See "Notes"</u>	DROP <u>30"</u>
							SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>								

0							<b>CONCRETE PAVEMENT:</b> Approximately 11-1/2" thick.	
5	98				GM		<b>FILL:</b> Brown, damp, very dense, silty fine and coarse GRAVEL with fine to coarse sand.	
10	27						Sampler refusal after 4".	
15	50/4"						<b>ALLUVIUM:</b> Brown, damp, very dense, silty fine and coarse GRAVEL with sand and cobbles and small boulders.	
20	20/6" 50/5"						Sampler refusal after 11".	
	50/4"						Sampler refusal after 4".	



**BORING LOG**

Auto Show Drive Interchange, Phase II  
Henderson, Nevada

PROJECT NO.  
300623001

DATE  
09/2003

FIGURE  
A-7

DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>07/19/2001</u>	BORING NO. <u>B-13</u>	
	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>2</u> OF <u>3</u>	
							METHOD OF DRILLING <u>Air rotary, 6" diameter bit</u>		
							DRIVE WEIGHT <u>See "Notes"</u>	DROP <u>30"</u>	
							SAMPLED BY <u>BOM</u>	LOGGED BY <u>BOM</u>	REVIEWED BY <u>BDB</u>
<b>DESCRIPTION/INTERPRETATION</b>									

20						GM	<u>ALLUVIUM (continued):</u> Brown, damp, dense to very dense, silty fine and coarse GRAVEL with sand and cobbles and small boulders.	
25	34						Sampler refusal after 10".	
30	27/6" 50/4"					GP	Brown, damp, medium dense to dense, poorly graded GRAVEL with sand and cobbles and small boulders; trace silt.	
35								
40								



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FIGURE  
A-8

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.	
	Bulk	Driven						07/19/2001	B-13	
								GROUND ELEVATION	SHEET	OF
								Not measured	3	3
								METHOD OF DRILLING	Air rotary, 6" diameter bit	
								DRIVE WEIGHT	See "Notes"	DROP
										30"
								SAMPLED BY	BOM	LOGGED BY
									BOM	REVIEWED BY
										BDB
								<b>DESCRIPTION/INTERPRETATION</b>		
40						●●●●●	GP	<p><b>ALLUVIUM (continued):</b> Brown, damp, medium dense to dense, poorly graded fine and coarse GRAVEL with sand and cobbles and small boulders.</p>		
45						●●●●●		<p>Dense to very dense; slightly cemented.</p>		
50						●●●●●		<p>Total Depth = 50.0 feet (boring terminated due to caving). Caving from approximately 31 to 50 feet. Groundwater not encountered during drilling. Backfilled and patched on 07/19/2001. Notes: Standard Penetration Test (SPT) samples were obtained with a 140-lb hammer. Modified split-barrel (MSB) drive samples were obtained with a 340-lb hammer.</p>		
55						●●●●●		<p>Boring located approximately 10 feet east of NDOT I-515 No. 658+30.</p>		
60						●●●●●				



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FIGURE  
A-9



DEPTH (feet)	Bulk Samples Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>07/18/2001</u> BORING NO. <u>B-14</u>
							GROUND ELEVATION <u>Not measured</u> SHEET <u>2</u> OF <u>3</u>
							METHOD OF DRILLING <u>Air rotary, 6" diameter bit</u>
							DRIVE WEIGHT <u>See "Notes"</u> DROP <u>30"</u>
							SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>
<b>DESCRIPTION/INTERPRETATION</b>							

20					GM	<u>ALLUVIUM (continued):</u> Brown, damp, very dense, silty fine and coarse GRAVEL with silt and gravel and cobbles and small boulders.
25		70				
35		59	6.1	130.0		
40						



<b>BORING LOG</b>		
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DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>07/18/2001</u> BORING NO. <u>B-14</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>3</u> OF <u>3</u>
								METHOD OF DRILLING <u>Air rotary, 6" diameter bit</u>	
								DRIVE WEIGHT <u>See "Notes"</u> DROP <u>30"</u>	
								SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>									
40							GM	<b>ALLUVIUM (continued):</b> Brown, moist, very dense, silty fine and coarse GRAVEL with sand and cobbles and boulders.	
								Brown, damp, hard, CALICHE; strongly cemented; composed primarily of coarse-grained material.	
45							CL	Brown, moist, very stiff, lean CLAY; trace fine sand; slightly gypsiferous.  Saturated.	
50			22	24.0	99.0			Total Depth = 50.5 feet. Groundwater measured at 47.7 feet approximately 6 days after drilling. Backfilled on 07/24/2001.	
								Notes: Standard Penetration Test (SPT) samples were obtained with a 140-lb hammer. Modified split-barrel (MSB) drive samples were obtained with a 340-lb hammer.	
55								Boring located approximately 120 feet east of NDOT I-215 Station No. 658+30.	
60									



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FIGURE  
A-12

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>07/19/2001</u>	BORING NO. <u>B-15</u>
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>2</u>
								METHOD OF DRILLING <u>Air rotary, 6" diameter bit</u>	
								DRIVE WEIGHT <u>See "Notes"</u>	DROP <u>30"</u>
								SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>									

0	35/6" 50/6"								
5	45/6" 50/2"								
10	25/1"								
15	34/6" 90/10"								
20		51	7.3	107.1					

**GM**  
**ALLUVIUM:**  
 Brown, damp, dense to very dense, silty fine and coarse GRAVEL with sand and cobbles and small boulders.

Sampler refusal after 12".

Sampler refusal after 8".

Sampler refusal after 1"; a few slightly cemented layers less than 12" thick.

Sampler refusal after 10".



<b>BORING LOG</b>		
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DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.	
	Bulk	Driven						07/19/2001	B-15	
								GROUND ELEVATION	SHEET	OF
								Not measured	2	2
								METHOD OF DRILLING	Air rotary, 6" diameter bit	
								DRIVE WEIGHT	See "Notes"	DROP
										30"
								SAMPLED BY	BOM	LOGGED BY
									BOM	REVIEWED BY
										BDB
<b>DESCRIPTION/INTERPRETATION</b>										
20							GM	<b>ALLUVIUM (continued):</b> Brown, damp, dense to very dense, silty fine and coarse GRAVEL with sand and cobbles and small boulders.		
								Sampler refusal after 12".		
25			45/6" 50/6"					Total Depth = 25.0 feet. Groundwater not encountered during drilling. Backfilled on 07/19/2001.		
								Notes: Standard Penetration Test (SPT) samples were obtained with a 140-lb hammer. Modified split barrel (MSB) drive samples were obtained with a 340-lb hammer.		
								Boring located approximately 350 feet east of NDOT I-515 Station No. 658+33.		
30										
35										
40										

**Ninyo & Moore**

**BORING LOG**

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FIGURE  
A-14

DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>07/19/2001</u>	BORING NO. <u>B-16</u>
	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>1</u>
							METHOD OF DRILLING <u>Air rotary, 6" diameter bit</u>	
							DRIVE WEIGHT <u>See "Notes"</u>	DROP <u>30"</u>
							SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>								

0	27/6" 94/9"	30	6.7	119.5	GM	<p><b>ALLUVIUM:</b> Brown, damp, dense to very dense, silty fine and coarse GRAVEL with sand and cobbles and small boulders.</p> <p>Sampler refusal after 15".</p> <p>Medium dense to dense.</p> <p>Very dense.</p>
5						
10	100					<p>Total Depth = 10.5 feet. Groundwater not encountered during drilling. Backfilled on 07/19/2001.</p> <p>Notes: Standard Penetration Test (SPT) samples were obtained with a 140-lb hammer. Modified split-barrel (MSB) drive samples were obtained with a 340-lb hammer.</p> <p>Boring located approximately 690 feet east of NDOT I-515 Station No. 658+33.</p>
15						
20						



<b>BORING LOG</b>		
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DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>07/19/2001</u>	BORING NO. <u>B-17</u>
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>Air rotary, 6" diameter bit</u>	
								DRIVE WEIGHT <u>See "Notes"</u>	DROP <u>30"</u>
								SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>									

0								GM	<p><u>ALLUVIUM:</u> Brown, damp, dense to very dense, silty fine and coarse GRAVEL with sand and cobbles and small boulders.</p> <p>Sampler refusal after 11".</p>
		35/6" 50/5"	5.1	104.5					<p>Sampler refusal after 2".</p>
5		50/2"							<p>A few slightly cemented layers less than approximately 12" thick.</p>
10		70							
		50/1"							<p>Sampler refusal after 1". Total Depth = 14.1 feet. Groundwater not encountered during drilling. Backfilled on 07/19/2001.</p> <p>Notes: Standard Penetration Test (SPT) samples were obtained with a 140-lb hammer. Modified split-barrel (MSB) drive samples were obtained with a 340-lb hammer.</p> <p>Boring located approximately 110 feet east of NDOT I-515 Station No. 665+30.</p>
15									
20									



<b>BORING LOG</b>		
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DEPTH (feet)	BULK SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>12/26/2002</u>	BORING NO. <u>B-19</u>	
							GROUND ELEVATION <u>1,783.8 ft. (543.70 m)</u>	SHEET <u>1</u> OF <u>2</u>	
							METHOD OF DRILLING <u>Air rotary, 6" diameter bit</u>		
							DRIVE WEIGHT <u>320 lbs.</u>	DROP <u>30"</u>	
							SAMPLED BY <u>BOM</u>	LOGGED BY <u>BOM</u>	REVIEWED BY <u>BDB</u>
<b>DESCRIPTION/INTERPRETATION</b>									

0						GP	<u>ALLUVIUM:</u> Brown, damp, very dense, poorly graded GRAVEL with cobbles and small boulders; few fine to coarse sand; trace silt.		
							Sampler refusal after 5".		
5							Sampler refusal after 4".		
							Slightly cemented.		
							Sampler refusal after 1".		
10									
15							Sampler refusal after 2".		
							Decrease in cementation.		
20									



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FIGURE  
A-18



DEPTH (feet)	Bulk Driven	SAMPLES	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>12/26/2002</u> BORING NO. <u>B-20</u>
								GROUND ELEVATION <u>1,784.3 ft. (543.85 m)</u> SHEET <u>1</u> OF <u>2</u>
								METHOD OF DRILLING <u>Air rotary, 6" diameter bit</u>
								DRIVE WEIGHT <u>320 lbs.</u> DROP <u>30"</u>
								SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>
<b>DESCRIPTION/INTERPRETATION</b>								

0				SM	<p><b>ALLUVIUM:</b> Brown, damp, dense, silty fine to coarse SAND with gravel and cobbles.</p>
5	50/6"			GM	<p>Brown, damp, very dense, silty fine and coarse GRAVEL with sand and cobbles and small boulders; sampler refusal after 6" at top of unit.</p> <p>Sampler refusal after 8".</p>
10	42/6" 50/2"				<p>Light brown, damp, moderately hard, CALICHE; moderately cemented; composed primarily of coarse-grained material.</p>
15	50/2"			GM	<p>Brown, damp, very dense, silty fine and coarse GRAVEL with sand and cobbles and small boulders; slightly cemented.</p> <p>Sampler refusal after 2".</p>
20					



<b>BORING LOG</b>		
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DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>12/26/2002</u> BORING NO. <u>B-20</u> GROUND ELEVATION <u>1,784.3 ft. (543.85 m)</u> SHEET <u>2</u> OF <u>2</u> METHOD OF DRILLING <u>Air rotary, 6" diameter bit</u> DRIVE WEIGHT <u>320 lbs.</u> DROP <u>30"</u> SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>		
	Bulk	Driven						<b>DESCRIPTION/INTERPRETATION</b>		
20			31/6" 50/3"				GM	<b>ALLUVIUM:</b> Brown, damp, very dense, silty fine and coarse GRAVEL with sand; sampler refusal after 9" at a depth of 20'.		
25			48				SM	Brown, damp, dense, silty fine to coarse SAND with gravel.		
30							GP-GM	Brown, damp, very dense, poorly graded GRAVEL with silt and sand and cobbles.		
35								Total depth = 30.0 feet. Groundwater not encountered during drilling. Backfilled on 12/26/2002.  Note: Boring located approximately 130 feet west of NDOT I-515 Station No. 655+00.		
40										



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FIGURE  
A-21

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.	
	Bulk	Driven						12/26/2002	B-21	
								GROUND ELEVATION	SHEET	OF
								1,788.7 ft (545.20 m)	1	2
								METHOD OF DRILLING		
								Air rotary, 6" diameter bit		
								DRIVE WEIGHT	DROP	
								320 lbs.	30"	
								SAMPLED BY		
								BOM		
								LOGGED BY		
								BOM		
								REVIEWED BY		
								BDB		
								<b>DESCRIPTION/INTERPRETATION</b>		
0							SM	<u>ALLUVIUM:</u> Brown, damp, medium dense to dense, silty fine to coarse SAND with gravel and cobbles.		
							GP-GM	Brown, damp, very dense, poorly graded GRAVEL with silt and sand and cobbles and small boulders.		
5			50/6"					Sampler refusal after 6".		
10			45/6" 50/1"					Sampler refusal after 7".		
15			50/2"					Sampler refusal after 2".		
20			50/5"					Sampler refusal after 5". Total depth = 19.4 feet		



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FIGURE  
A-22



DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>12/27/2002</u>	BORING NO. <u>B-22</u>
	Driven						SAMPLES	GROUND ELEVATION <u>1,785.9 ft (544.33 m)</u>
							METHOD OF DRILLING <u>Mud rotary, 6" diameter bit</u>	
							DRIVE WEIGHT <u>320 lbs.</u>	DROP <u>30"</u>
							SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>								

0						GP-GM	<b>ALLUVIUM:</b> Brown, damp, very dense, poorly graded GRAVEL with silt and sand and cobbles and small boulders.	
	X	50/5"					Sampler refusal after 5".	
5								
	X	23/6" 50/4"					Sampler refusal after 10".	
10								
	X	50/4"					Sampler refusal after 4".	
15								
	X	50/3"					Sampler refusal after 3".	
20								



<b>BORING LOG</b>		
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DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>12/27/2002</u>	BORING NO. <u>B-22</u>	
	Driven						GROUND ELEVATION <u>1,785.9 ft (544.33 m)</u>	SHEET <u>2</u> OF <u>3</u>	
							METHOD OF DRILLING <u>Mud rotary, 6" diameter bit</u>		
							DRIVE WEIGHT <u>320 lbs.</u>	DROP <u>30"</u>	
							SAMPLED BY <u>BOM</u>	LOGGED BY <u>BOM</u>	REVIEWED BY <u>BDB</u>
<b>DESCRIPTION/INTERPRETATION</b>									

20	50/<1"				GP-GM	<p><b>ALLUVIUM (continued):</b> Brown, damp, very dense, poorly graded GRAVEL with silt and sand and cobbles and small boulders; sampler refusal at a depth of 20'.</p>
25	50/3"				GM	<p>Brown, moist, very dense, silty fine and coarse GRAVEL with sand; sampler refusal after 3" at top of unit.</p> <p>Increase in sand content.</p>
30					SP-SM	<p>Brown, moist, dense to very dense, poorly graded SAND with silt and gravel; a few sandy gravel layers several inches thick.</p>
35						
40					SC	<p>Brown, moist, medium dense to dense, clayey fine to coarse SAND with gravel.</p>



<b>BORING LOG</b>		
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DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>12/27/2002</u> BORING NO. <u>B-22</u>		
	Bulk	Driven						GROUND ELEVATION <u>1,785.9 ft (544.33 m)</u>	SHEET <u>3</u> OF <u>3</u>	METHOD OF DRILLING <u>Mud rotary, 6" diameter bit</u>
								DRIVE WEIGHT <u>320 lbs.</u>	DROP <u>30"</u>	
								SAMPLED BY <u>BOM</u>	LOGGED BY <u>BOM</u>	REVIEWED BY <u>BDB</u>
								DESCRIPTION/INTERPRETATION		
40							SC	<b>ALLUVIUM (continued):</b> Brown, saturated, medium dense to dense, clayey fine to coarse SAND; few fine gravel.		
45							CH	Brown, saturated, very stiff, sandy fat CLAY; trace fine gravel.		
50								Total depth = 50.0 feet. Groundwater not encountered during drilling. Caving from approximately 30 to 50 feet. Backfilled on 12/31/2002.		
55								Note: Boring located approximately 100 feet west of NDOT I-515 Station No. 653+91.		
60										



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FIGURE  
A-26

DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>12/26/2002</u>	BORING NO. <u>B-23</u>	
	Driven						GROUND ELEVATION <u>1,789.8 ft. (545.52 m)</u>	SHEET <u>1</u> OF <u>2</u>	
							METHOD OF DRILLING <u>Air rotary, 6" diameter bit</u>		
							DRIVE WEIGHT <u>320 lbs.</u>	DROP <u>30"</u>	
							SAMPLED BY <u>BOM</u>	LOGGED BY <u>BOM</u>	REVIEWED BY <u>BDB</u>
<b>DESCRIPTION/INTERPRETATION</b>									

0							GP-GM	<p><u>ALLUVIUM:</u> Brown, damp, dense to very dense, poorly graded GRAVEL with silt and sand and cobbles and small boulders.</p>
5		50						<p>Dense to very dense.</p>
10		45/6" 50/5"						<p>Sampler refusal after 11".</p>
15		50/6"						<p>Sampler refusal after 6".</p>
20		76						



<b>BORING LOG</b>		
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DEPTH (feet)	Bulk	SAMPLES	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>12/26/2002</u>	BORING NO. <u>B-23</u>
	Driven							GROUND ELEVATION <u>1,789.8 ft. (545.52 m)</u>	SHEET <u>2</u> OF <u>2</u>
								METHOD OF DRILLING <u>Air rotary, 6" diameter bit</u>	
								DRIVE WEIGHT <u>320 lbs.</u>	DROP <u>30"</u>
								SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>									

20								<p>Total depth = 20.0 feet.  Groundwater not encountered during drilling.  Backfilled on 12/26/2002.</p> <p>Note:  Boring located approximately 120 feet west of NDOT I-515 Station No. 652+03.</p>	
25									
30									
35									
40									



<b>BORING LOG</b>		
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DEPTH (feet)	SAMPLES	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>12/26/2002</u>	BORING NO. <u>B-24</u>
							GROUND ELEVATION <u>1,791.0 ft. (545.90 m)</u>	SHEET <u>1</u> OF <u>2</u>
Bulk Driven							METHOD OF DRILLING <u>Air rotary, 6" diameter bit</u>	
							DRIVE WEIGHT <u>320 lbs.</u>	DROP <u>30"</u>
							SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>								

0					SM	<b>ALLUVIUM:</b> Brown, damp, medium dense, silty fine to coarse SAND with gravel and cobbles and small boulders.
5	42/6" 50/4"				GM	Brown, damp, medium dense, silty fine and coarse GRAVEL with sand and cobbles and small boulders. Dense. Sampler refusal after 10".
10	75					Very dense.
15	50/2"					Sampler refusal after 2".
20	50/6"					Sampler refusal after 6".
80						



<b>BORING LOG</b>		
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DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>12/26/2002</u>	BORING NO. <u>B-24</u>
	Driven						SAMPLES	GROUND ELEVATION <u>1,791.0 ft. (545.90 m)</u>
							METHOD OF DRILLING <u>Air rotary, 6" diameter bit</u>	
							DRIVE WEIGHT <u>320 lbs.</u>	DROP <u>30"</u>
							SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>								

20						GM	<b>ALLUVIUM (continued):</b> Brown, damp, very dense, silty fine and coarse GRAVEL with sand and cobbles and small boulders.	
25								
30							Total depth = 30.0 feet. Groundwater not encountered during drilling. Backfilled on 12/26/2002.	
35							Note: Boring located approximately 120 feet west of NDOT I-515 Station No. 651+03.	
40								



**BORING LOG**

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FIGURE  
A-30



DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>12/24/2002</u> BORING NO. <u>B-25</u>	
	Bulk	Driven						GROUND ELEVATION <u>1,783.1 ft. (543.49 m)</u>	SHEET <u>2</u> OF <u>2</u>
								METHOD OF DRILLING <u>Air rotary, 6" diameter bit</u>	
								DRIVE WEIGHT <u>320 lbs.</u> DROP <u>30"</u>	
								SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>									
20							GM	ALLUVIUM (continued): Brown, damp, very dense, silty fine and coarse GRAVEL with sand and cobbles and small boulders.	
							SM	Brown, damp, very dense, silty fine to coarse SAND with gravel.	
25			50/5"				GM	Brown, damp, very dense, silty fine and coarse GRAVEL with sand and cobbles and small boulders. Sampler refusal after 5".	
30								Total depth = 30.0 feet. Groundwater not encountered during drilling. Backfilled on 12/24/2002.	
								Note: Boring located approximately 130 feet east of NDOT I-515 Station No. 654+06.	
35									
40									



**BORING LOG**

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FIGURE  
A-32

DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>12/24/2002</u> BORING NO. <u>B-26</u>
	Driven						SAMPLES
							METHOD OF DRILLING <u>Air rotary, 6" diameter bit</u>
							DRIVE WEIGHT <u>320 lbs.</u> DROP <u>30"</u>
							SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>
<b>DESCRIPTION/INTERPRETATION</b>							

0						GM	<b>ALLUVIUM:</b> Brown, damp, very dense, silty fine and coarse GRAVEL with sand and cobbles and small boulders.
	X	28/6" 50/3"					Sampler refusal after 9".
5							
	X	50/4"					Sampler refusal after 4".
						SW	Brown, damp, very dense, well-graded fine to coarse SAND with fine gravel.
10		41/6" 50/5"	4.1	126.2			Sampler refusal after 11".
							A few thin slightly cemented layers.
15		50/6"					Sampler refusal after 6".
20		40/6" 50/5"					Sampler refusal after 11".



**BORING LOG**

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FIGURE  
A-33



DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>12/24/2002</u>	BORING NO. <u>B-27</u>
	Driven						GROUND ELEVATION <u>1,785.8 ft. (544.31 m)</u>	SHEET <u>1</u> OF <u>2</u>
							METHOD OF DRILLING <u>Air rotary, 6" diameter bit</u>	
							DRIVE WEIGHT <u>320 lbs.</u>	DROP <u>30"</u>
							SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>								

0						GM	<b>ALLUVIUM:</b> Brown, damp, very dense, silty fine and coarse GRAVEL with sand and cobbles and small boulders.	
5	78	35/6" 50/3"					Sampler refusal after 9".	
10		50/4"					Sampler refusal after 4".	
15		28/6" 50/2"					Sampler refusal after 8".	
20		40/6" 50/4"					Sampler refusal after 10".	



<b>BORING LOG</b>		
Auto Show Drive Interchange, Phase II Henderson, Nevada		
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DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>12/24/2002</u>	BORING NO. <u>B-27</u>
	Bulk	Driven						GROUND ELEVATION <u>1,785.8 ft. (544.31 m)</u>	SHEET <u>2</u> OF <u>2</u>
								METHOD OF DRILLING <u>Air rotary, 6" diameter bit</u>	
								DRIVE WEIGHT <u>320 lbs.</u>	DROP <u>30"</u>
								SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>									

20								Total depth = 19.8 feet. Groundwater not encountered during drilling. Backfilled on 12/24/2002.  Note: Boring located approximately 100 feet east of NDOT I-515 Station No. 652+00.	
25									
30									
35									
40									



<b>BORING LOG</b>		
Auto Show Drive Interchange, Phase II Henderson, Nevada		
PROJECT NO. 300623001	DATE 09/2003	FIGURE A-36

DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>12/24/2002</u>	BORING NO. <u>B-28</u>
	Driven						GROUND ELEVATION <u>1,786.5 ft. (544.53 m)</u>	SHEET <u>1</u> OF <u>3</u>
							METHOD OF DRILLING <u>Air rotary, 6" diameter bit</u>	
							DRIVE WEIGHT <u>320 lbs.</u>	DROP <u>30"</u>
							SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>								

0						GM	<b>FILL:</b> Brown, damp, very dense, silty fine and coarse GRAVEL with sand and cobbles and small boulders.	
						GC	<b>ALLUVIUM:</b> Brown, damp, very dense, clayey fine and coarse GRAVEL with sand and cobbles and small boulders.	
		74						
5								Sampler refusal after 4".
		50/4"						
								Sampler refusal after 9".
10								
		37/6" 50/3"						
								Sampler refusal after 11".
15			6.7	111.4				
		36/6" 50/5"						
						GP-GM	Brown, damp, very dense, poorly graded GRAVEL with silt and sand and cobbles and small boulders.	
								Sampler refusal after 3".
20		50/3"						



<b>BORING LOG</b>		
Auto Show Drive Interchange, Phase II Henderson, Nevada		
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DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>12/24/2002</u>	BORING NO. <u>B-28</u>
	Bulk	Driven						GROUND ELEVATION <u>1,786.5 ft. (544.53 m)</u>	SHEET <u>2</u> OF <u>3</u>
METHOD OF DRILLING <u>Air rotary, 6" diameter bit</u>								DRIVE WEIGHT <u>320 lbs.</u>	DROP <u>30"</u>
SAMPLED BY <u>BOM</u>								LOGGED BY <u>BOM</u>	REVIEWED BY <u>BDB</u>
<b>DESCRIPTION/INTERPRETATION</b>									

20					GP-GM	<p><u>ALLUVIUM (continued):</u> Brown, damp, very dense, poorly graded GRAVEL with silt and sand and cobbles and small boulders.</p>
					SM	<p>Brown, damp, dense to very dense, silty fine to coarse SAND; few fine gravel.</p>
25		30				<p>Increase in fine to coarse gravel content.</p>
30						
35						
40						<p>With cobbles.</p>



<b>BORING LOG</b>		
Auto Show Drive Interchange, Phase II Henderson, Nevada		
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DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>12/26/2002</u>	BORING NO. <u>B-29</u>
	Bulk	Driven						GROUND ELEVATION <u>1,787.4 ft. (544.80 m)</u>	SHEET <u>1</u> OF <u>2</u>
METHOD OF DRILLING <u>Air rotary, 6" diameter bit</u>								DRIVE WEIGHT <u>320 lbs.</u>	DROP <u>30"</u>
SAMPLED BY <u>BOM</u>								LOGGED BY <u>BOM</u>	REVIEWED BY <u>BDB</u>
<b>DESCRIPTION/INTERPRETATION</b>									

0							GM	<b>ALLUVIUM:</b> Brown, damp, very dense, silty fine and coarse GRAVEL with sand and cobbles and small boulders.
			50/2"					Sampler refusal after 2".
5							GP-GM	Brown, damp, dense, poorly graded GRAVEL with silt and sand and cobbles and small boulders.
			39					Very dense.
10								Sampler refusal after 5".
			50/5"					
15								Sampler refusal after 8".
			26/6" 50/2"					
			50/6"					Sampler refusal after 6".
20								Total depth = 19.5 feet.



<b>BORING LOG</b>		
Auto Show Drive Interchange, Phase II Henderson, Nevada		
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DEPTH (feet)	SAMPLES	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>12/26/2002</u>	BORING NO. <u>B-30</u>	
							GROUND ELEVATION <u>1,788.3 ft. (545.07 m)</u>	SHEET <u>1</u> OF <u>2</u>	
							METHOD OF DRILLING <u>Air rotary, 6" diameter bit</u>		
							DRIVE WEIGHT <u>320 lbs.</u>	DROP <u>30"</u>	
							SAMPLED BY <u>BOM</u>	LOGGED BY <u>BOM</u>	REVIEWED BY <u>BDB</u>
<b>DESCRIPTION/INTERPRETATION</b>									

0						GP-GM	<b>ALLUVIUM:</b> Brown, damp, very dense, poorly graded GRAVEL with silt and sand and cobbles and small boulders.
	50/2"						Sampler refusal after 2".
5							
	28/6" 50/4"						Sampler refusal after 10".
10		50/6" 50/4"	6.1	111.2		GM	Brown, damp, very dense, silty fine and coarse GRAVEL with sand and cobbles and small boulders.
							Sampler refusal after 10".
15		50/3"					Sampler refusal after 3".
20							



**BORING LOG**

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FIGURE  
A-42

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>12/26/2002</u> BORING NO. <u>B-30</u>	
	Bulk	Driven						GROUND ELEVATION <u>1,788.3 ft. (545.07 m)</u>	SHEET <u>2</u> OF <u>2</u>
								METHOD OF DRILLING <u>Air rotary, 6" diameter bit</u>	
								DRIVE WEIGHT <u>320 lbs.</u> DROP <u>30"</u>	
								SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>									
20			29/6" 50/4"				GM	<p><u>ALLUVIUM (continued):</u> Brown, damp, very dense, silty fine and coarse GRAVEL with sand and cobbles and small boulders; sampler refusal after 10" at a depth of 20'.</p> <p>Increase in sand content.</p>	
25									
30								<p>Total depth = 30.0 feet. Groundwater not encountered during drilling. Backfilled on 12/26/2002.</p> <p>Note: Boring located approximately 110 feet east of NDOT I-515 Station No. 649+12.</p>	
35									
40									



**BORING LOG**

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FIGURE  
A-43

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>05/11/2003</u>	BORING NO. <u>B-31</u>
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>6</u>
METHOD OF DRILLING <u>Mud rotary, 6" diameter bit</u>								DRIVE WEIGHT <u>See "Notes"</u>	DROP <u>30"</u>
SAMPLED BY <u>DCF</u>								LOGGED BY <u>DCF</u>	REVIEWED BY <u>BDB</u>

DEPTH (feet)	Bulk	Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0								<b>CONCRETE PAVEMENT:</b> Approximately 11" thick.
5							GM	<b>FILL:</b> Brown, damp, very dense, silty fine and coarse GRAVEL with sand.
10							GM	<b>ALLUVIUM:</b> Brown, damp, very dense, silty fine and coarse GRAVEL with sand and cobbles.
15								
20								



**BORING LOG**

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FIGURE  
A-44

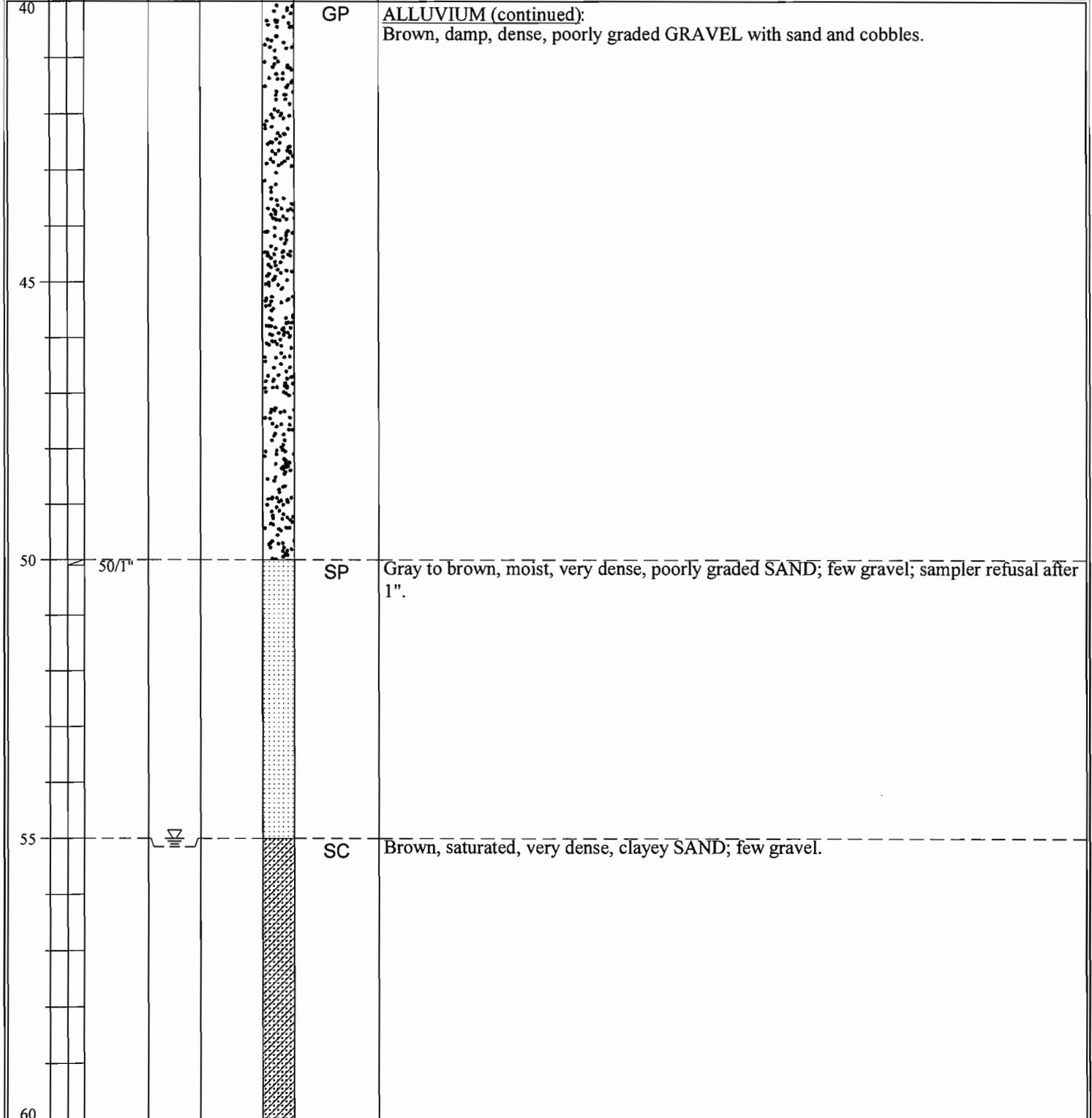
DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>05/11/2003</u>	BORING NO. <u>B-31</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>2</u> OF <u>6</u>	
								METHOD OF DRILLING <u>Mud rotary, 6" diameter bit</u>		
								DRIVE WEIGHT <u>See "Notes"</u>	DROP <u>30"</u>	
								SAMPLED BY <u>DCF</u>	LOGGED BY <u>DCF</u>	REVIEWED BY <u>BDB</u>
<b>DESCRIPTION/INTERPRETATION</b>										

20							GM	<u>ALLUVIUM (continued):</u> Brown, damp, very dense, silty fine and coarse GRAVEL with sand and cobbles.	
25									
30									
35							GP	Brown, damp, dense, poorly graded GRAVEL with sand and cobbles.	
40									



<b>BORING LOG</b>		
Auto Show Drive Interchange, Phase II Henderson, Nevada		
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DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>05/11/2003</u>	BORING NO. <u>B-31</u>	
	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>3</u> OF <u>6</u>	
							METHOD OF DRILLING <u>Mud rotary, 6" diameter bit</u>		
							DRIVE WEIGHT <u>See "Notes"</u>	DROP <u>30"</u>	
							SAMPLED BY <u>DCF</u>	LOGGED BY <u>DCF</u>	REVIEWED BY <u>BDB</u>
<b>DESCRIPTION/INTERPRETATION</b>									



**BORING LOG**

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FIGURE  
A-46

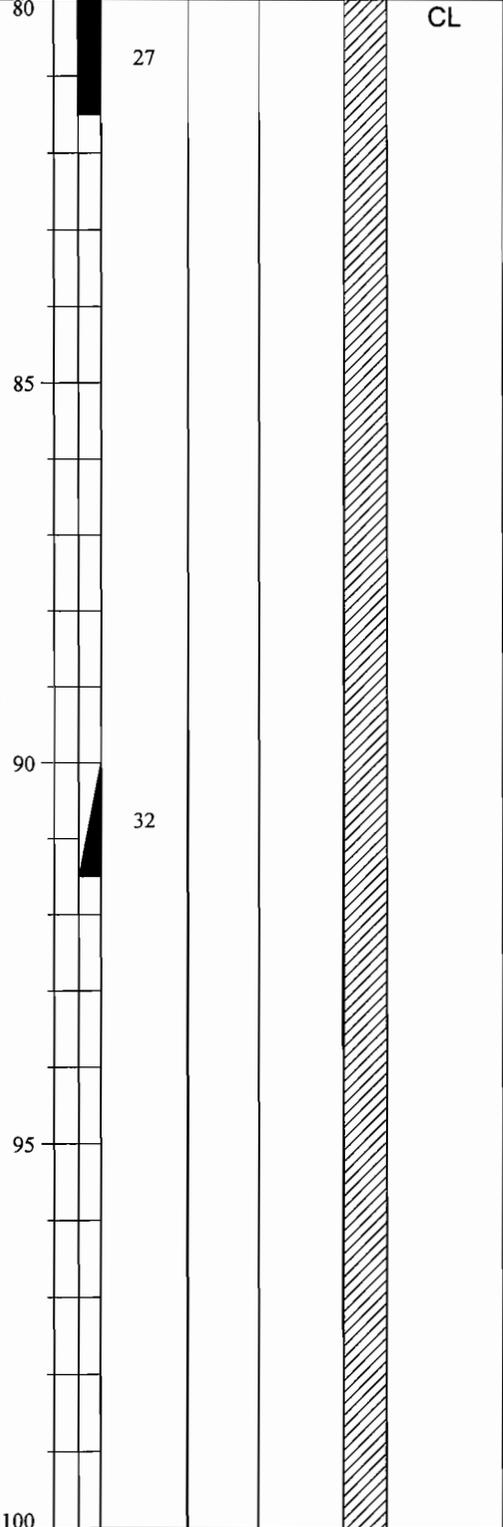
DEPTH (feet)	Bulk Driven	SAMPLES	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>05/11/2003</u>	BORING NO. <u>B-31</u>
								GROUND ELEVATION <u>Not measured</u>	SHEET <u>4</u> OF <u>6</u>
								METHOD OF DRILLING <u>Mud rotary, 6" diameter bit</u>	
								DRIVE WEIGHT <u>See "Notes"</u>	DROP <u>30"</u>
								SAMPLED BY <u>DCF</u>	LOGGED BY <u>DCF</u>

DESCRIPTION/INTERPRETATION									
60	65	30.0	77.0	SC	<u>ALLUVIUM (continued):</u> Brown, saturated, very dense, clayey SAND; few gravel.				
65				CL	Brown, saturated, stiff to very stiff, lean CLAY; few caliche gravel.				
70	30								
75									
80									



BORING LOG		
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DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>05/11/2003</u>	BORING NO. <u>B-31</u>
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>5</u> OF <u>6</u>
METHOD OF DRILLING <u>Mud rotary, 6" diameter bit</u>								DRIVE WEIGHT <u>See "Notes"</u>	DROP <u>30"</u>
SAMPLED BY <u>DCF</u>								LOGGED BY <u>DCF</u>	REVIEWED BY <u>BDB</u>
<b>DESCRIPTION/INTERPRETATION</b>									



CL  
**ALLUVIUM (continued):**  
 Brown, saturated, stiff to very stiff, lean CLAY; few caliche gravel.

<b>Ninyo &amp; Moore</b>			<b>BORING LOG</b>		
			Auto Show Drive Interchange, Phase II Henderson, Nevada		
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300623001	09/2003	A-48			

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.	
	Bulk	Driven						05/11/2003	B-31	
								GROUND ELEVATION	SHEET	OF
								Not measured	6	6
								METHOD OF DRILLING		
								Mud rotary, 6" diameter bit		
								DRIVE WEIGHT	See "Notes"	DROP
										30"
								SAMPLED BY	LOGGED BY	REVIEWED BY
								DCF	DCF	BDB
<b>DESCRIPTION/INTERPRETATION</b>										
100			26	45.8	74.3		CL	<b>ALLUVIUM (continued):</b>		
								Brown, saturated, stiff to very stiff, lean CLAY; few caliche gravel.		
								Total depth = 101.5 feet. Groundwater encountered at approximately 55.0 feet during drilling. Backfilled and patched on 05/11/2003.		
								Notes: Standard Penetration Test (SPT) samples were obtained with a 140-lb hammer. Modified split-barrel (MSB) drive samples were obtained with a 340-lb hammer.		
105								Boring located approximately 115 feet west of NDOT I-515 Station No. 644+05.		
110										
115										
120										



**BORING LOG**

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FIGURE  
A-49

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>05/12/2003</u> BORING NO. <u>B-32</u>		
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>6</u>	METHOD OF DRILLING <u>Mud rotary, 6" diameter bit</u>
								DRIVE WEIGHT <u>See "Notes"</u>	DROP <u>30"</u>	
								SAMPLED BY <u>DCF</u>	LOGGED BY <u>DCF</u>	REVIEWED BY <u>BDB</u>
<b>DESCRIPTION/INTERPRETATION</b>										
0							SM	<b>ALLUVIUM:</b> Brown, saturated, dense, silty fine and coarse SAND with gravel and cobbles.		
							GM	Brown, saturated, very dense, silty fine and coarse GRAVEL with sand and cobbles.		
5								Light brown, saturated, moderately hard, CALICHE; moderately cemented, composed primarily of coarse-grained material.		
10							GM	Brown, saturated, very dense, silty fine and coarse GRAVEL with sand and cobbles.		
15										
20										



**BORING LOG**

Auto Show Drive Interchange, Phase II  
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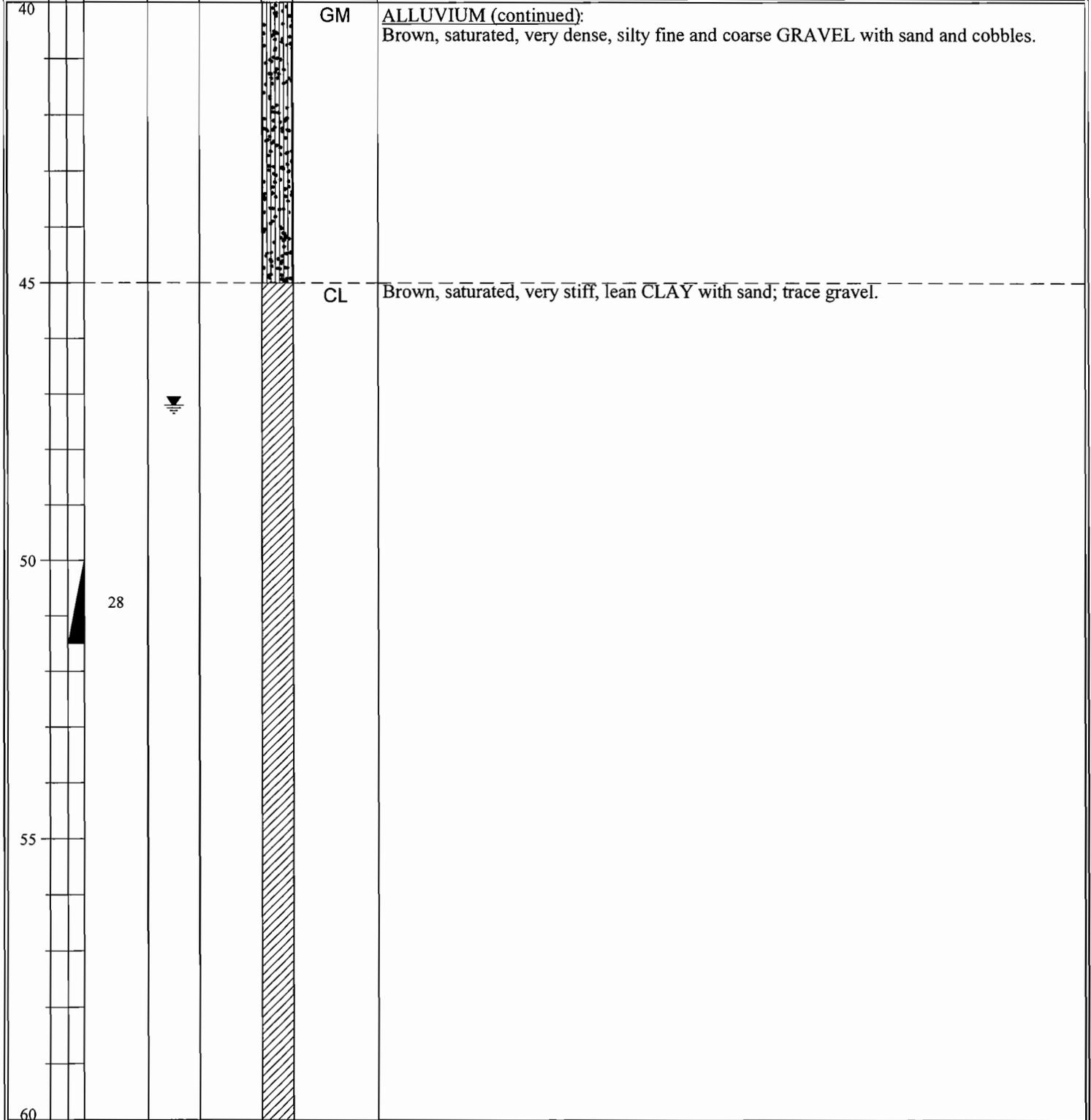
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FIGURE  
A-50



DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>05/12/2003</u>	BORING NO. <u>B-32</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>3</u> OF <u>6</u>	
								METHOD OF DRILLING <u>Mud rotary, 6" diameter bit</u>		
								DRIVE WEIGHT <u>See "Notes"</u>	DROP <u>30"</u>	
								SAMPLED BY <u>DCF</u>	LOGGED BY <u>DCF</u>	REVIEWED BY <u>BDB</u>
<b>DESCRIPTION/INTERPRETATION</b>										



DEPTH (feet)	SAMPLES Bulk Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>05/12/2003</u>	BORING NO. <u>B-32</u>
							GROUND ELEVATION <u>Not measured</u>	SHEET <u>4</u> OF <u>6</u>
							METHOD OF DRILLING <u>Mud rotary, 6" diameter bit</u>	
							DRIVE WEIGHT <u>See "Notes"</u>	DROP <u>30"</u>
							SAMPLED BY <u>DCF</u>	LOGGED BY <u>DCF</u>

DEPTH (feet)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
60	26	44.2	77.3		CL	<u>ALLUVIUM (continued):</u> Brown, saturated, very stiff, lean CLAY with sand; trace gravel.
65						
70	38					
75						
80						



**BORING LOG**

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DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>05/12/2003</u>	BORING NO. <u>B-32</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>5</u> OF <u>6</u>	
								METHOD OF DRILLING <u>Mud rotary, 6" diameter bit</u>		
								DRIVE WEIGHT <u>See "Notes"</u>	DROP <u>30"</u>	
								SAMPLED BY <u>DCF</u>	LOGGED BY <u>DCF</u>	REVIEWED BY <u>BDB</u>

DEPTH (feet)	Bulk	Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
80			34	57.6	60.8		CL	<b>ALLUVIUM (continued):</b> Brown, saturated, very stiff, lean CLAY with sand; trace gravel.
85								
90			40					
95								
100								



**BORING LOG**

Auto Show Drive Interchange, Phase II  
Henderson, Nevada

PROJECT NO. 300623001	DATE 09/2003	FIGURE A-54
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DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>05/12/2003</u> BORING NO. <u>B-32</u>		
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>6</u> OF <u>6</u>	METHOD OF DRILLING <u>Mud rotary, 6" diameter bit</u>
								DRIVE WEIGHT <u>See "Notes"</u>	DROP <u>30"</u>	SAMPLED BY <u>DCF</u> LOGGED BY <u>DCF</u> REVIEWED BY <u>BDB</u>
								<b>DESCRIPTION/INTERPRETATION</b>		
100			45	47.0	78.1		CL	<b>ALLUVIUM (continued):</b> Brown, saturated, very stiff, lean CLAY with sand; trace gravel.		
								Total depth = 101.5 feet. Groundwater measured at 47.2 feet approximately 2 days after drilling. Backfilled 05/14/2003.		
								Notes: Standard Penetration Test (SPT) samples were obtained with a 140-lb hammer. Modified split-barrel (MSB) drive samples were obtained with a 340-lb hammer.		
								Boring located approximately 120 feet west of NDOT I-515 Station No. 655+00.		
105										
110										
115										
120										



BORING LOG		
Auto Show Drive Interchange, Phase II Henderson, Nevada		
PROJECT NO. 300623001	DATE 09/2003	FIGURE A-55



DEPTH (feet)	Bulk	SAMPLES	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>05/12/2003</u>	BORING NO. <u>B-33</u>	
	Driven							GROUND ELEVATION <u>Not measured</u>	SHEET <u>2</u> OF <u>6</u>	
								METHOD OF DRILLING <u>Mud rotary, 6" diameter bit</u>		
								DRIVE WEIGHT <u>See "Notes"</u>	DROP <u>30"</u>	
								SAMPLED BY <u>DCF</u>	LOGGED BY <u>DCF</u>	REVIEWED BY <u>BDB</u>
<b>DESCRIPTION/INTERPRETATION</b>										

20									
25									
30									
35									
40									

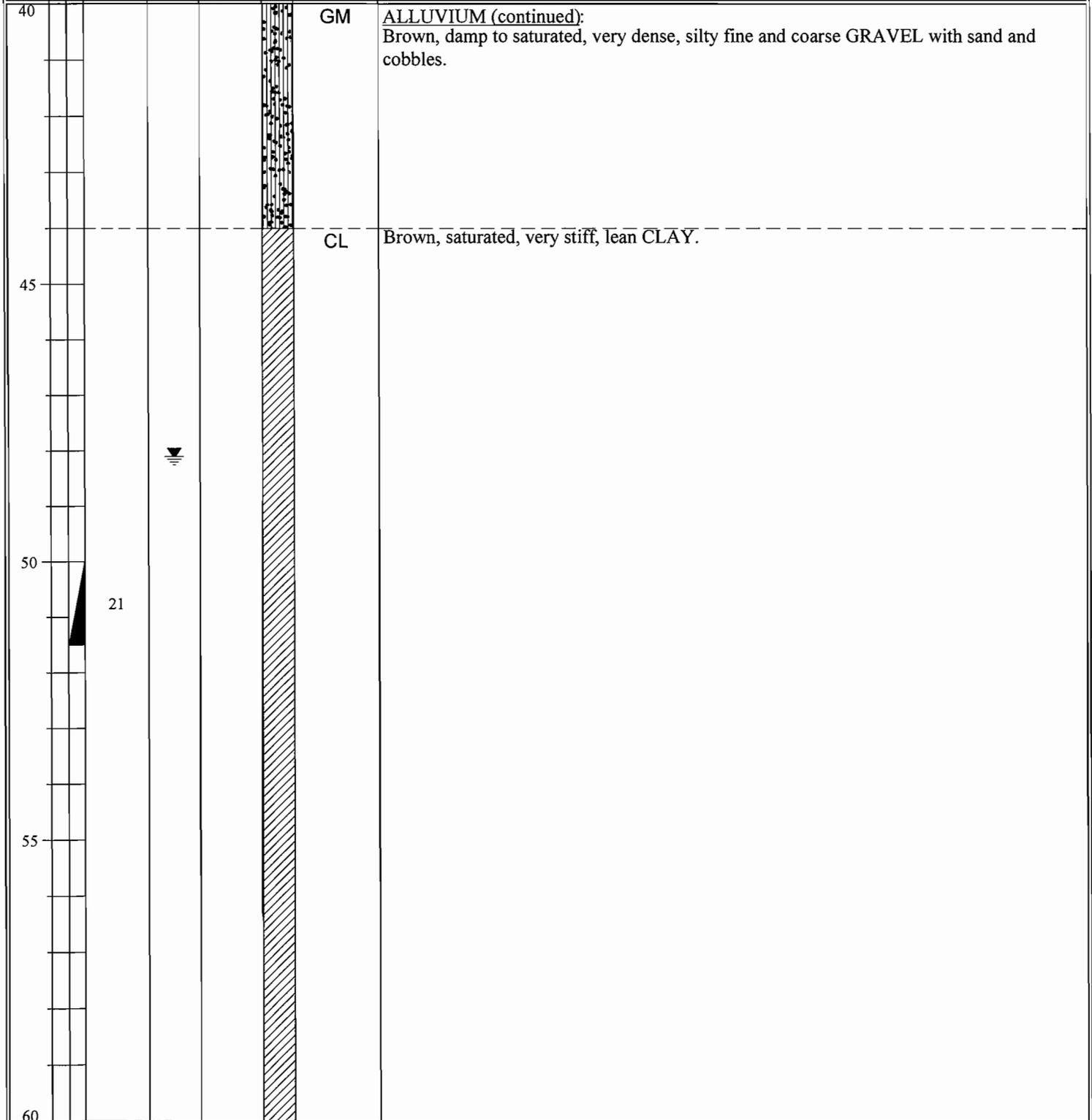
GM

ALLUVIUM (continued):  
Brown, damp to saturated, very dense, silty fine and coarse GRAVEL with sand and cobbles.



<b>BORING LOG</b>		
Auto Show Drive Interchange, Phase II Henderson, Nevada		
PROJECT NO. 300623001	DATE 09/2003	FIGURE A-57

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>05/12/2003</u>	BORING NO. <u>B-33</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>3</u> OF <u>6</u>	
								METHOD OF DRILLING <u>Mud rotary, 6" diameter bit</u>		
								DRIVE WEIGHT <u>See "Notes"</u>	DROP <u>30"</u>	
								SAMPLED BY <u>DCF</u>	LOGGED BY <u>DCF</u>	REVIEWED BY <u>BDB</u>
<b>DESCRIPTION/INTERPRETATION</b>										



<b>BORING LOG</b>		
Auto Show Drive Interchange, Phase II Henderson, Nevada		
PROJECT NO. 300623001	DATE 09/2003	FIGURE A-58

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>05/12/2003</u>	BORING NO. <u>B-33</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>4</u> OF <u>6</u>	
								METHOD OF DRILLING <u>Mud rotary, 6" diameter bit</u>		
								DRIVE WEIGHT <u>See "Notes"</u>	DROP <u>30"</u>	
								SAMPLED BY <u>DCF</u>	LOGGED BY <u>DCF</u>	REVIEWED BY <u>BDB</u>

DEPTH (feet)	Bulk	Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
60			24	39.0	79.6		CL	ALLUVIUM (continued): Brown, saturated, very stiff, lean CLAY.
65								
70								
75								
80								



BORING LOG		
Auto Show Drive Interchange, Phase II Henderson, Nevada		
PROJECT NO. 300623001	DATE 09/2003	FIGURE A-59



DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>05/12/2003</u> BORING NO. <u>B-33</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>6</u> OF <u>6</u>
								METHOD OF DRILLING <u>Mud rotary, 6" diameter bit</u>	
								DRIVE WEIGHT <u>See "Notes"</u> DROP <u>30"</u>	
								SAMPLED BY <u>DCF</u> LOGGED BY <u>DCF</u> REVIEWED BY <u>BDB</u>	
								<b>DESCRIPTION/INTERPRETATION</b>	
100			32	33.0	87.2		CL	<b>ALLUVIUM (continued):</b> Brown, saturated, very stiff, lean CLAY.	
								Total depth = 101.5 feet. Groundwater measured at 48.1 feet approximately 2 days after drilling. Backfilled 05/14/2003.  Notes: Standard Penetration Test (SPT) samples were obtained with a 140-lb hammer. Modified split-barrel (MSB) drive samples were obtained with a 340-lb hammer.  Boring located approximately 130 feet east of NDOT I-515 Station No. 650+09.	
105									
110									
115									
120									

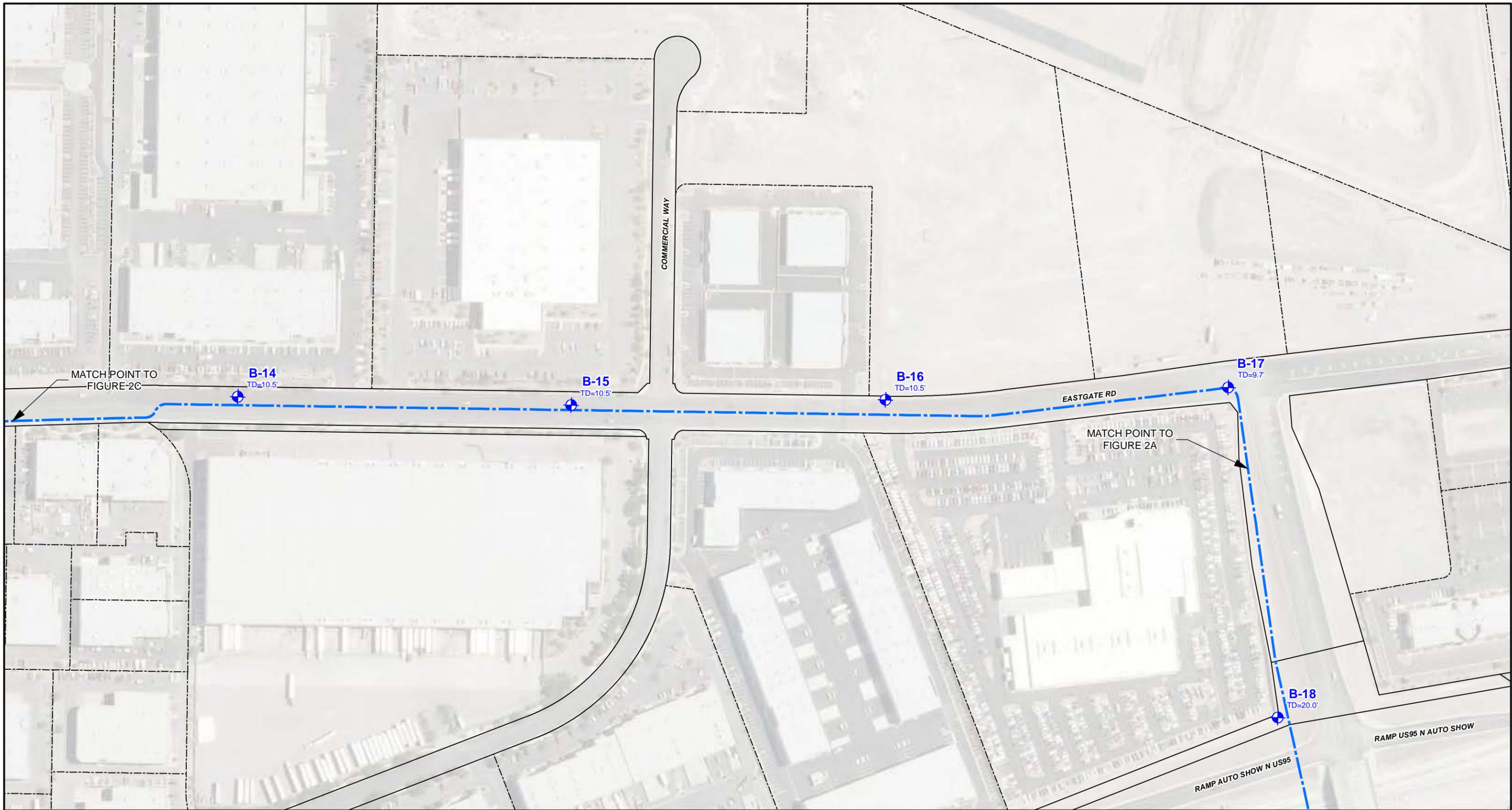


<b>BORING LOG</b>		
Auto Show Drive Interchange, Phase II Henderson, Nevada		
PROJECT NO. 300623001	DATE 09/2003	FIGURE A-61



# APPENDIX E

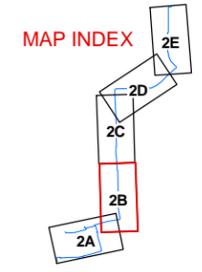
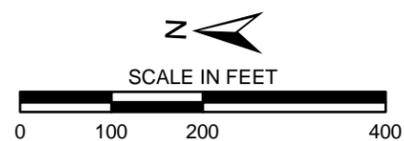
## I-515 East of Auto Show Drive



SOURCE: Fault Line - gisgate.co.clark.nv.us (GISMO), 2010; Aerial Imagery - Photo Date: May, 2007, ESRI, i-cubed, USDA FSA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGP.

NOTES: PIPELINE LOCATION SHOWN ON THIS FIGURE IS APPROXIMATE AND IS SHOWN FOR ILLUSTRATIVE PURPOSES ONLY  
 ALL DIRECTIONS, DIMENSIONS, AND LOCATIONS ARE APPROXIMATE

SEE FIGURE 2A FOR LEGEND, NOTES,  
 AND SOURCE MAP



<b>Ninyo &amp; Moore</b>		<b>BORING LOCATIONS</b>	FIGURE <b>2B</b>
PROJECT NO. 303145001	DATE 5/11		

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DEPTH (feet)	SAMPLES		BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>11/1/10</u> BORING NO. <u>B-15</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>Mayhew 1000 air-rotary drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (spooling cable)</u> DROP <u>30"</u>	
								SAMPLED BY <u>SLM</u> LOGGED BY <u>SLM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>									
0							GP	<b>ASPHALT CONCRETE:</b> Approximately 5 to 5-1/2 inches thick.	
			50/4"					<b>FILL:</b> Brown, damp, very dense, poorly graded GRAVEL with sand. Sampler refusal after 4 inches.	
							SW-SM	<b>NATIVE SOIL:</b> Brown, damp, medium dense, well graded SAND with silt and gravel.	
5			14/6" 14/6" 11/6"	8.3	112.4				
			5/6" 5/6" 5/6"	--	--			Loose.	
10								Total depth = 10.5 feet. Groundwater not encountered during drilling. Backfilled and patched on 11/1/10.	
								<b>NOTE:</b> Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.	
15									
20									



**BORING LOG**

AMPAC PIPELINE, GIBSON ROAD AND AUTO SHOW DRIVE  
 HENDERSON, NEVADA

PROJECT NO.  
 303145001

DATE  
 5/11

FIGURE  
 A-16

DEPTH (feet)	SAMPLES		BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>11/1/10</u> BORING NO. <u>B-16</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>Mayhew 1000 air-rotary drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (spooling cable)</u> DROP <u>30"</u>	
								SAMPLED BY <u>SLM</u> LOGGED BY <u>SLM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>									
0							GP	ASPHALT CONCRETE: Approximately 4-1/2 to 5 inches thick.	
			37/6" 50/2"	7.2	109.0			FILL: Brown, damp, very dense, poorly graded GRAVEL with sand. Sampler refusal after 8 inches.	
			23/6" 23/6" 28/6"				SW-SM	NATIVE SOIL: Brown, damp, medium dense, well graded SAND with silt and gravel.	
5									
10			20/6" 50/<1"	7.8	118.5			Sampler refusal after 6 inches; very dense.	
								Total depth = 10.5 feet. Groundwater not encountered during drilling. Backfilled and patched on 11/1/10.	
								NOTE: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.	
15									
20									

**Ninyo & Moore**

**BORING LOG**

AMPAC PIPELINE, GIBSON ROAD AND AUTO SHOW DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
303145001

DATE  
5/11

FIGURE  
A-17

DEPTH (feet)	SAMPLES		BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>11/3/10</u> BORING NO. <u>B-17</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>Mayhew 1000 air-rotary drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (spooling cable)</u> DROP <u>30"</u>	
								SAMPLED BY <u>SLM</u> LOGGED BY <u>SLM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>									
0							GP-GM	<u>ASPHALT CONCRETE:</u> Approximately 6 to 6-1/4 inches thick.	
			32/6" 44/6" 50/6"	6.9	115.0			<u>FILL:</u> Brown, damp, dense, poorly graded GRAVEL with silt and sand.	
							GP-GM	<u>NATIVE SOIL:</u> Dark gray, damp, very dense, poorly graded GRAVEL with silt, sand, cobbles, and boulders.	
5			30/1"					Sampler refusal after 1 inch.	
								Sampler refusal after 8 inches.	
10			38/6" 50/2"	-	-			Total depth = 9.7 feet. Groundwater not encountered during drilling. Backfilled and patched on 11/3/10.	
								<u>NOTE:</u> Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.	
15									
20									



**BORING LOG**

AMPAC PIPELINE, GIBSON ROAD AND AUTO SHOW DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
303145001

DATE  
5/11

FIGURE  
A-18

DEPTH (feet)	SAMPLES		BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>11/1/10</u> BORING NO. <u>B-18</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>2</u>
								METHOD OF DRILLING <u>Mayhew 1000 air-rotary drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (spooling cable)</u> DROP <u>30"</u>	
								SAMPLED BY <u>SLM</u> LOGGED BY <u>SLM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>									
0			18/6" 22/6" 28/6"	6.4	110.7		GP-GM	<b>FILL:</b> Brown, damp, medium dense, poorly graded GRAVEL with silt and sand.	
5			40/6" 50/5"				GP	<b>NATIVE SOIL:</b> Dark gray, damp, very dense, poorly graded GRAVEL with sand and boulders; slightly cemented; sampler refusal after 11 inches at top of unit.	
10			50/1"					Sampler refusal after 1 inch.	
15			50/5"					Sampler refusal after 5 inches.	
20									



**BORING LOG**

AMPAC PIPELINE, GIBSON ROAD AND AUTO SHOW DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
303145001

DATE  
5/11

FIGURE  
A-19

DEPTH (feet)	SAMPLES		BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.				
	Bulk	Driven						11/1/10	B-18				
								GROUND ELEVATION	SHEET	OF			
								METHOD OF DRILLING	2	2			
								DRIVE WEIGHT	140 lbs. (spooling cable)	DROP	30"		
								SAMPLED BY	SLM	LOGGED BY	SLM	REVIEWED BY	BDB
								<b>DESCRIPTION/INTERPRETATION</b>					
20			50 < 1"					<p>Sampler refusal after less than 1 inch.  Total depth = 20.0 feet.  Groundwater not encountered during drilling.  Backfilled on 11/1/10.</p> <p><u>NOTE:</u>  Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.</p>					
25													
30													
35													
40													

**Ninyo & Moore**

**BORING LOG**

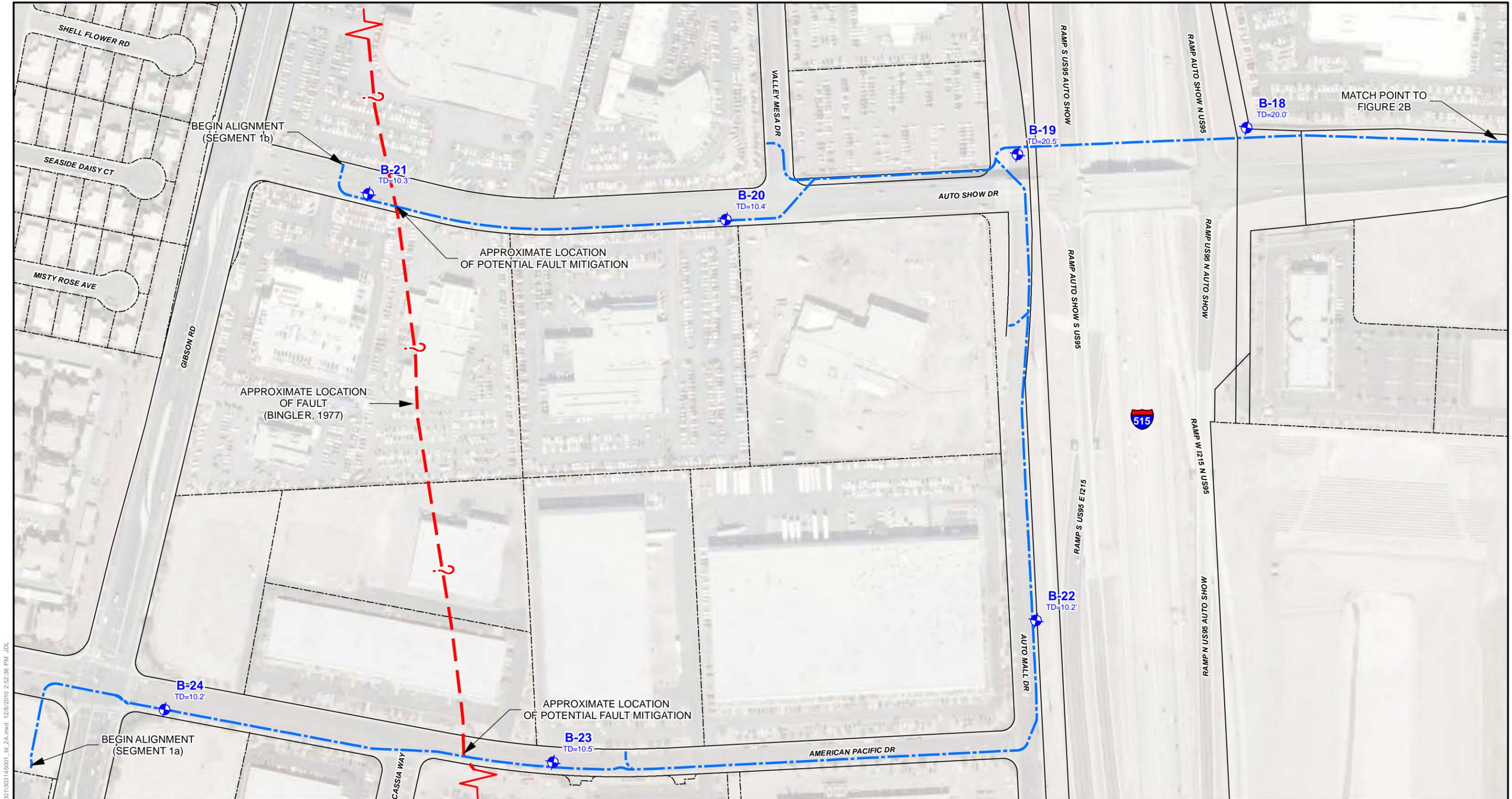
AMPAC PIPELINE, GIBSON ROAD AND AUTO SHOW DRIVE  
HENDERSON, NEVADA

PROJECT NO.	DATE	FIGURE
303145001	5/11	A-20



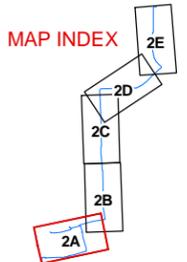
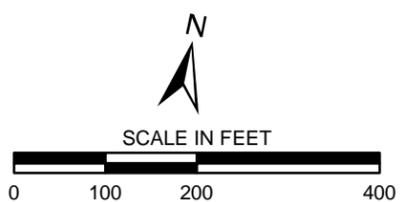
# APPENDIX F

## I-515 West of Auto Show Drive



SOURCE: Fault Line - gisgate.co.clark.nv.us (GISMO), 2010; Aerial Imagery - Photo Date: May, 2007, ESRI, i-cubed, USDA FSA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGP.

**LEGEND**  
 **B-24** BORING  
 TD = TOTAL DEPTH  
 PIPELINE ALIGNMENT (SEE NOTES)



NOTES: PIPELINE LOCATION SHOWN ON THIS FIGURE IS APPROXIMATE AND IS SHOWN FOR ILLUSTRATIVE PURPOSES ONLY  
 ALL DIRECTIONS, DIMENSIONS, AND LOCATIONS ARE APPROXIMATE

<b>Ninyo &amp; Moore</b>		<b>BORING LOCATIONS</b>	AMPAC PIPELINE GIBSON ROAD AND AUTO SHOW DRIVE HENDERSON, NEVADA	FIGURE
PROJECT NO. 303145001	DATE 5/11			<b>2A</b>

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DEPTH (feet)	Bulk	BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>11/1/10</u> BORING NO. <u>B-19</u>
	Driven						GROUND ELEVATION <u>Not measured</u> SHEET <u>1</u> OF <u>2</u>
							METHOD OF DRILLING <u>Mayhew 1000 air-rotary drill rig</u>
							DRIVE WEIGHT <u>140 lbs. (spooling cable)</u> DROP <u>30"</u>
							SAMPLED BY <u>SLM</u> LOGGED BY <u>SLM</u> REVIEWED BY <u>BDB</u>
							<b>DESCRIPTION/INTERPRETATION</b>

0							<b>ASPHALT CONCRETE:</b> Approximately 3-1/4 to 3-1/2 inches thick. <b>FILL:</b> Brown, damp, very dense, poorly graded GRAVEL with silt and sand. Sampler refusal after 11 inches.
	45/6" 50/5"	6.6	102.8		GP-GM		
					SP		<b>NATIVE SOIL:</b> Brown, damp, very dense, poorly graded SAND with gravel and cobbles.  Sampler refusal after 2 inches.
5	50/2"						
	50/6" 20/1"				GP-GM		Brown, damp, very dense, poorly graded GRAVEL with silt, sand, and cobbles; sampler refusal after 7 inches at top of unit.
10							
	34/6" 50/3"	7.1	121.1				Sampler refusal after 9 inches.
15							
	30/6" 30/6"	4.6	124.8				Dense.
20							



**BORING LOG**

AMPAC PIPELINE, GIBSON ROAD AND AUTO SHOW DRIVE  
HENDERSON, NEVADA

PROJECT NO. 303145001	DATE 5/11	FIGURE A-21
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DEPTH (feet)	Bulk	BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>11/1/10</u>	BORING NO. <u>B-19</u>
	Driven						SAMPLES	GROUND ELEVATION <u>Not measured</u>
							METHOD OF DRILLING <u>Mayhew 1000 air-rotary drill rig</u>	
							DRIVE WEIGHT <u>140 lbs. (spooling cable)</u>	DROP <u>30"</u>
							SAMPLED BY <u>SLM</u> LOGGED BY <u>SLM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>								

20	45/6"	GP-GM	<p><b>NATIVE SOIL (continued):</b>          Brown, damp, dense, poorly graded GRAVEL with silt, sand, and cobbles.          Total depth = 20.5 feet.          Groundwater not encountered during drilling.          Backfilled and patched on 11/1/10.</p> <p><u>NOTE:</u>          Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.</p>					
25								
30								
35								
40								



**BORING LOG**

AMPAC PIPELINE, GIBSON ROAD AND AUTO SHOW DRIVE  
 HENDERSON, NEVADA

PROJECT NO. 303145001	DATE 5/11	FIGURE A-22
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DEPTH (feet)	SAMPLES		BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.				
	Bulk	Driven						11/1/10	B-20				
								GROUND ELEVATION	SHEET	OF			
								METHOD OF DRILLING	Mayhew 1000 air-rotary drill rig				
								DRIVE WEIGHT	140 lbs. (spooling cable)	DROP	30"		
								SAMPLED BY	SLM	LOGGED BY	SLM	REVIEWED BY	BDB
								<b>DESCRIPTION/INTERPRETATION</b>					
0								<b>ASPHALT CONCRETE:</b> Approximately 6 to 6-1/2 inches thick.					
			50/3"				GP-GM	<b>FILL:</b> Brown, damp, very dense, poorly graded GRAVEL with silt and sand. Sampler refusal after 3 inches.					
							SM	<b>NATIVE SOIL:</b> Brown, damp, medium dense, silty SAND with gravel.					
5			14/6" 12/6" 14/6"	8.2	105.2								
10			27/6" 34/6" 50/5"	5.8	121.0			Sampler refusal after 17 inches; very dense.					
								Total depth = 10.4 feet. Groundwater not encountered during drilling. Backfilled and patched on 11/1/10.					
								<b>NOTE:</b> Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.					
15													
20													



**BORING LOG**

AMPAC PIPELINE, GIBSON ROAD AND AUTO SHOW DRIVE  
HENDERSON, NEVADA

PROJECT NO.	DATE	FIGURE
303145001	5/11	A-23

DEPTH (feet)	SAMPLES		BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>11/1/10</u> BORING NO. <u>B-21</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>Mayhew 1000 air-rotary drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (spooling cable)</u> DROP <u>30"</u>	
								SAMPLED BY <u>SLM</u> LOGGED BY <u>SLM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>									
0							GP-GM	<b>ASPHALT CONCRETE:</b> Approximately 3 to 3-1/4 inches thick.	
								<b>FILL:</b> Brown, damp, dense, poorly graded GRAVEL with silt and sand.	
			40/6" 30/6" 40/6"	9.8	110.7		SP	<b>NATIVE SOIL:</b> Brown, damp, dense, poorly graded SAND with gravel and cobbles.	
5			7/6" 10/6" 50/6"	4.6	117.0			Medium dense.	
10			23/6" 40/6" 50/4"	7.1	120.8			Very dense; sampler refusal after 16 inches.	
								Total depth = 10.3 feet. Groundwater not encountered during drilling. Backfilled and patched on 11/1/10.	
								<b>NOTE:</b> Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.	
15									
20									



**BORING LOG**

AMPAC PIPELINE, GIBSON ROAD AND AUTO SHOW DRIVE  
HENDERSON, NEVADA

PROJECT NO. 303145001	DATE 5/11	FIGURE A-24
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DEPTH (feet)	SAMPLES		BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>11/1/10</u> BORING NO. <u>B-22</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>Mayhew 1000 air-rotary drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (spooling cable)</u> DROP <u>30"</u>	
								SAMPLED BY <u>SLM</u> LOGGED BY <u>SLM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>									
0							GP-GM	<u>ASPHALT CONCRETE:</u> Approximately 3-3/8 to 3-5/8 inches thick.	
								<u>FILL:</u> Brown, damp, medium dense, poorly graded GRAVEL with silt and sand.	
				8.0	120.1		SW-SM	<u>NATIVE SOIL:</u> Brown, damp, medium dense, well-graded SAND with silt, gravel, and boulders.	
	30/6"								
	30/6"								
	24/6"								
5				5.2	115.7			Sampler refusal after 10 inches; very dense.	
	40/6"								
	50/4"								
10				7.4	121.4			Sampler refusal after 14 inches.	
	30/6"								
	35/6"								
	50/2"								
15								Total depth = 10.2 feet. Groundwater not encountered during drilling. Backfilled and patched on 11/1/10.	
								<u>NOTE:</u> Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.	
20									

**Ninyo & Moore**

**BORING LOG**

AMPAC PIPELINE, GIBSON ROAD AND AUTO SHOW DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
303145001

DATE  
5/11

FIGURE  
A-25

DEPTH (feet)	SAMPLES		BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>11/1/10</u> BORING NO. <u>B-23</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>Mayhew 1000 air-rotary drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (spooling cable)</u> DROP <u>30"</u>	
								SAMPLED BY <u>SLM</u> LOGGED BY <u>SLM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>									
0							GP-GM	<b>ASPHALT CONCRETE:</b> Approximately 3 to 3-1/2 inches thick.	
								<b>FILL:</b> Brown, damp, medium dense, poorly graded GRAVEL with silt and sand.	
			27/6" 17/6" 18/6"	8.6	113.2		SW-SM	<b>NATIVE SOIL:</b> Brown, damp, medium dense, well-graded SAND with silt and gravel.	
5			23/6" 16/6" 14/6"	4.6	113.7			Dense.	
10			22/6" 37/6" 43/6"	8.1	123.5				
								Total depth = 10.5 feet. Groundwater not encountered during drilling. Backfilled and patched on 11/1/10.	
								<b>NOTE:</b> Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.	
15									
20									



**BORING LOG**

AMPAC PIPELINE, GIBSON ROAD AND AUTO SHOW DRIVE  
 HENDERSON, NEVADA

PROJECT NO.  
 303145001

DATE  
 5/11

FIGURE  
 A-26

DEPTH (feet)	SAMPLES		BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.	
	Bulk	Driven						11/1/10	B-24	
								GROUND ELEVATION	SHEET	OF
								METHOD OF DRILLING		
								DRIVE WEIGHT	DROP	
								SAMPLED BY	LOGGED BY	REVIEWED BY
								<b>DESCRIPTION/INTERPRETATION</b>		
0							GM	<b>ASPHALT CONCRETE:</b> Approximately 3-1/4 to 3-1/2 inches thick.		
			50/5"					<b>FILL:</b> Brown, damp, very dense, silty GRAVEL with sand. Sampler refusal after 5 inches.		
							SW-SM	<b>NATIVE SOIL:</b> Brown, damp, medium dense, well-graded SAND with silt, gravel, and cobbles.		
5			36/6" 28/6" 18/6"	-	-			Sampler refusal after 14 inches; very dense; moist.		
10			16/6" 38/6" 50/2"	14.4	98.5			Total depth = 10.2 feet. Groundwater not encountered during drilling. Backfilled and patched on 11/1/10.		
15								<b>NOTE:</b> Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.		
20										



**BORING LOG**

AMPAC PIPELINE, GIBSON ROAD AND AUTO SHOW DRIVE  
HENDERSON, NEVADA

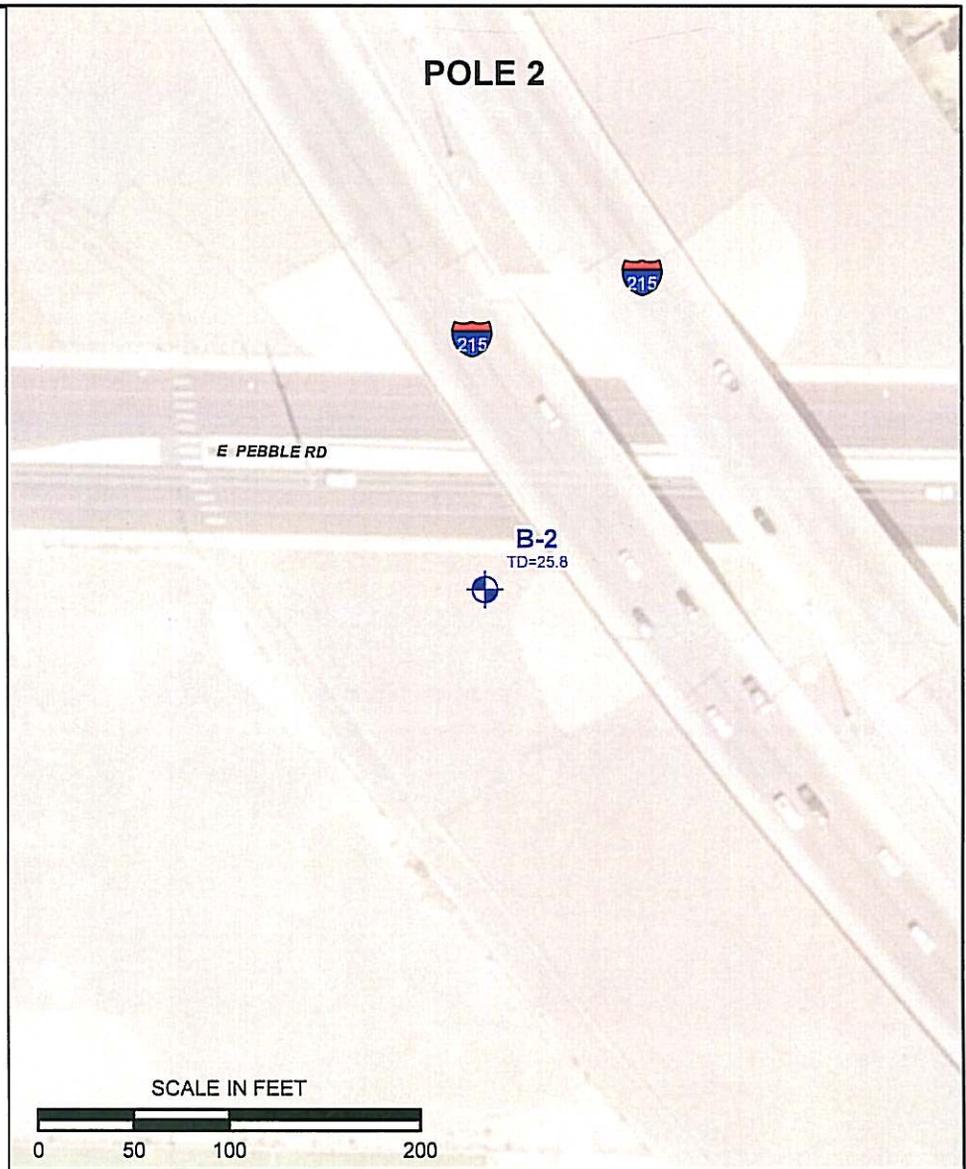
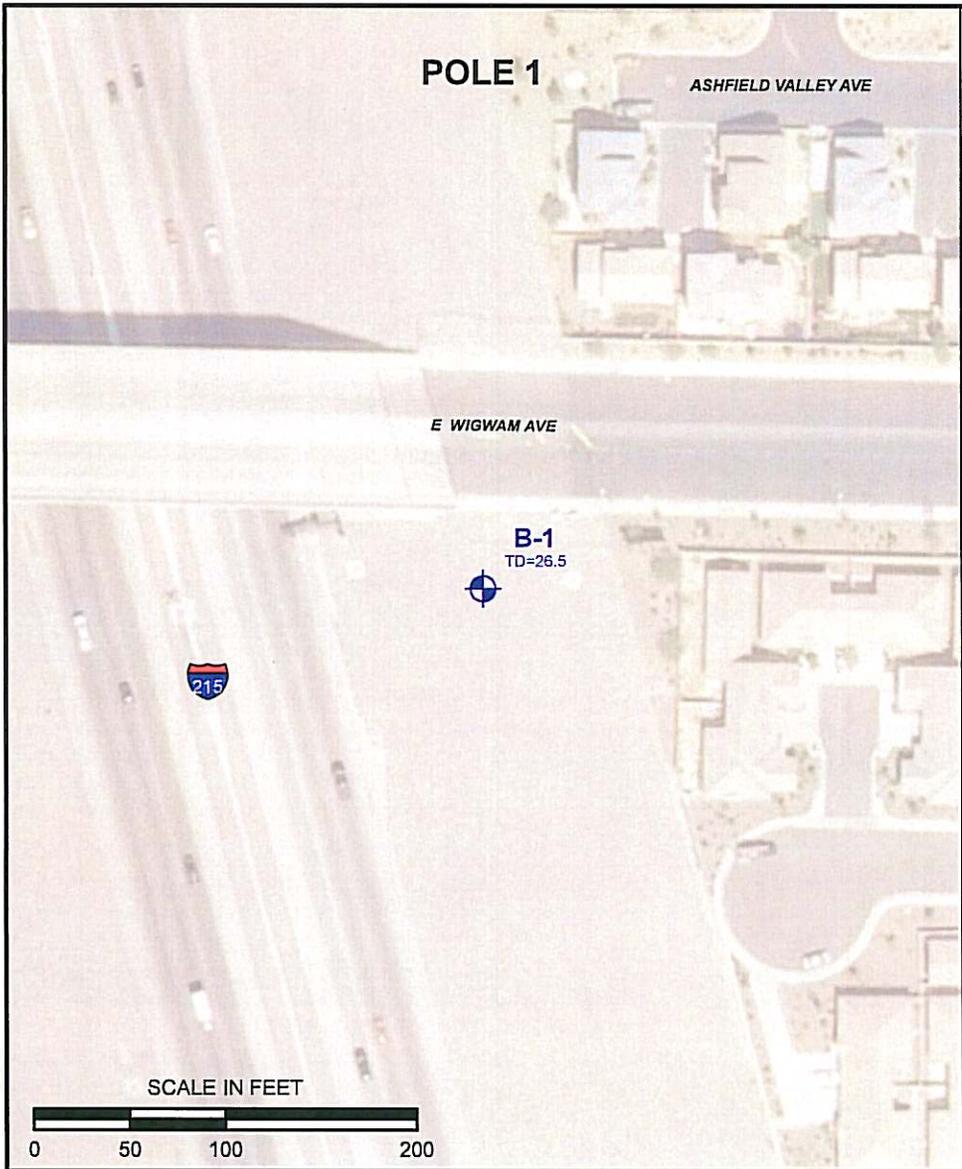
PROJECT NO.	DATE	FIGURE
303145001	5/11	A-27



# APPENDIX G

I-215 West of I-515 (B1, B2, and B3)

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**LEGEND**

 **B-2 BORING**  
 TD=25.8 TD = TOTAL DEPTH IN FEET

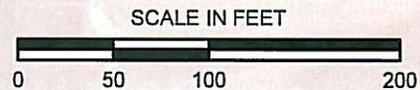
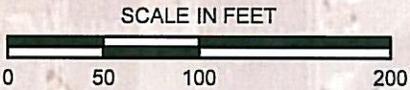
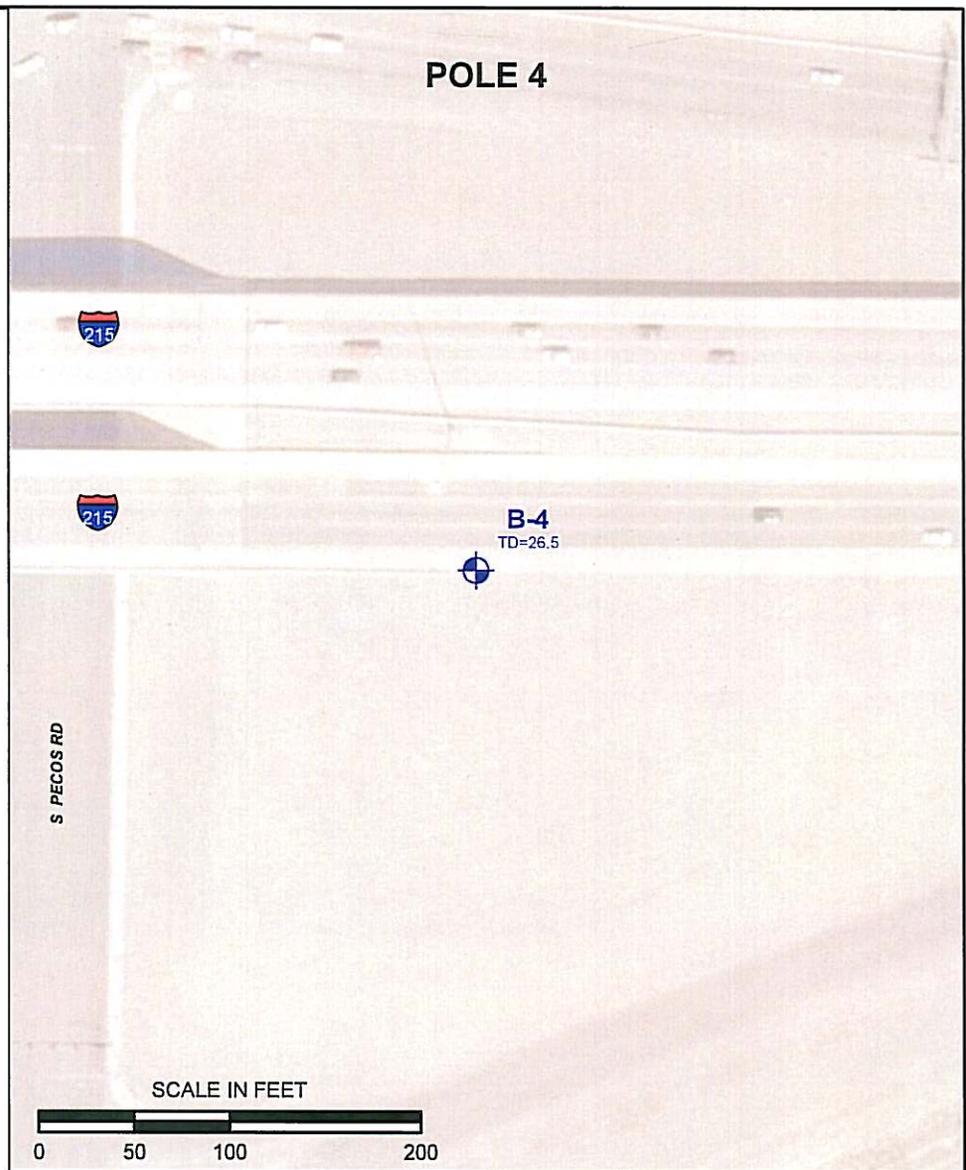
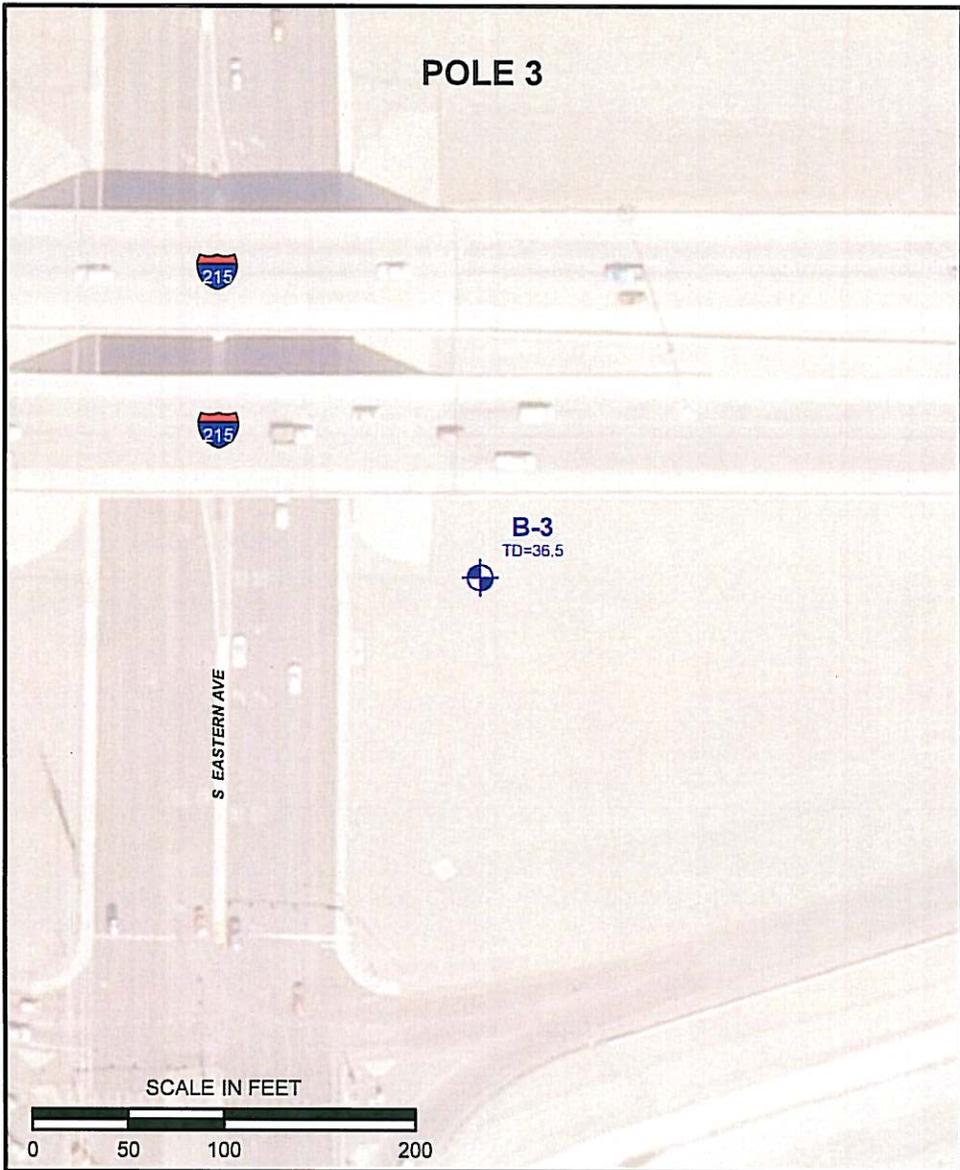
**SOURCES:**  
 Aerial Imagery - Photo Date: September, 2008.  
 ESRI, Incubed, USDA FSA, USGS, AEX,  
 GeoEye, Getmapping, Aerogrid, IGP.

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS  
 ARE APPROXIMATE.



		<b>EXPLORATORY BORING LOCATIONS</b> ITS INFRASTRUCTURE IMPROVEMENTS FOR BRUCE WOODBURY BELTWAY WINDMILL LANE TO I-515 CLARK COUNTY, NEVADA	FIGURE
			<b>2</b>
PROJECT NO.	DATE		
303175001	4/11		

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**LEGEND**

**B-4 BORING**  
 TD=26.5 TD = TOTAL DEPTH IN FEET

SOURCES:  
 Aerial Imagery - Photo Date: September, 2008.  
 ESRI, i-cubed, USDA FSA, USGS, AEX,  
 GeoEye, Getmapping, Aerogrid, IGP.

NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS  
 ARE APPROXIMATE.



<b><i>Ninyo &amp; Moore</i></b>		<b>EXPLORATORY BORING LOCATIONS</b>	<b>FIGURE</b>  <b>3</b>
PROJECT NO.	DATE	ITS INFRASTRUCTURE IMPROVEMENTS FOR BRUCE WOODBURY BELTWAY WINDMILL LANE TO I-515 CLARK COUNTY, NEVADA	
303175001	4/11		

DEPTH (feet)	SAMPLES		BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>3/3/11</u> BORING NO. <u>Appendix G (B-1)</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>2</u>
								METHOD OF DRILLING <u>Mayhew 1000 air-rotary drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (spooling cable)</u> DROP <u>30"</u>	
								SAMPLED BY <u>SLM</u> LOGGED BY <u>SLM</u> REVIEWED BY <u>EDE</u>	
<b>DESCRIPTION/INTERPRETATION</b>									
0								<b>PORTLAND CEMENT CONCRETE:</b> Concrete approximately 15 to 16 inches thick.	
			25/6" 28/6" 30/6"	7.4	115.1		GP-GM	<b>FILL:</b> Brown, damp, medium dense, poorly graded GRAVEL with silt and sand.	
5			22/6" 30/6" 33/6"	7.7	111.2		GW	<b>NATIVE SOIL:</b> Brown, damp, medium dense, well-graded GRAVEL with sand, cobbles, and small boulders.	
10			6/6" 6/6" 27/6"						
15			50/5"	--	--			Very dense.	
20									

**Ninyo & Moore**

**BORING LOG**

ITS INFRASTRUCTURE IMPROVEMENTS FOR BRUCE WOODBURY BELTWAY,  
WINDMILL LANE TO INTERSTATE 515, CLARK COUNTY, NEVADA

PROJECT NO.  
303175001

DATE  
4/11

FIGURE  
A-11

DEPTH (feet)	SAMPLES		BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>3/3/11</u> BORING NO. <u>Appendix G (B-1)</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>2</u> OF <u>2</u>
								METHOD OF DRILLING <u>Mayhew 1000 air-rotary drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (spooling cable)</u> DROP <u>30"</u>	
								SAMPLED BY <u>SLM</u> LOGGED BY <u>SLM</u> REVIEWED BY <u>EDE</u>	
								<b>DESCRIPTION/INTERPRETATION</b>	
20			8/6" 8/6" 50/4"				SM	<p><b>NATIVE SOIL (continued):</b> Brown, damp, very dense, silty SAND with gravel, cobbles, and small boulders. Sampler refusal after 10 inches.</p>	
25			8/6" 18/6" 40/6"	7.2	118.4			<p>Medium dense.</p>	
30								<p>Total depth = 26.5 feet. Groundwater not encountered during drilling. Backfilled on 3/3/11.</p> <p><b>NOTE:</b> Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.</p>	
35									
40									



**BORING LOG**

ITS INFRASTRUCTURE IMPROVEMENTS FOR BRUCE WOODBURY BELTWAY,  
WINDMILL LANE TO INTERSTATE 515, CLARK COUNTY, NEVADA

PROJECT NO.  
303175001

DATE  
4/11

FIGURE  
A-12

DEPTH (feet)	SAMPLES		BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.	
	Bulk	Driven						12/18/08	Appendix G (B-2)	
								GROUND ELEVATION	SHEET	OF
								METHOD OF DRILLING		
								DRIVE WEIGHT	DROP	
								SAMPLED BY	LOGGED BY	REVIEWED BY
								<b>DESCRIPTION/INTERPRETATION</b>		
0			27/6" 50/5"	3.4	113.3		GM	<p><u>NATIVE SOIL:</u> Brown, damp, very dense, silty GRAVEL with sand, cobbles, and small boulders.</p> <p>Sampler refusal after 11 inches.</p>		
5			50/1"					<p>Sampler refusal after 1 inch.</p> <p>Moist.</p>		
10			35/6" 50/2"					<p>Sampler refusal after 8 inches.</p>		
								<p>Total depth = 10.7 feet. Groundwater not encountered during drilling. Backfilled on 12/18/08.</p> <p>NOTE: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.</p>		
15										
20										



**BORING LOG**

REUNION TRAILS PARK, CASADY HOLLOW AVENUE AND CHAPATA DRIVE  
HENDERSON, NEVADA

PROJECT NO.  
302789001

DATE  
01/09

FIGURE  
A-6

DEPTH (feet)	Bulk	SAMPLES	BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>2/7/11</u>	BORING NO. <u>Appendix G (B-3)</u>
	Driven							GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>3</u>
								METHOD OF DRILLING <u>Mayhew 1000 air-rotary drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>
								SAMPLED BY <u>RDB</u> LOGGED BY <u>RDB</u> REVIEWED BY <u>EDE</u>	
<b>DESCRIPTION/INTERPRETATION</b>									

0								<b>PORTLAND CEMENT CONCRETE:</b> Concrete is approximately 13 to 13-1/2 inches thick.	
5	28/6" 48/6" 32/6"	7.5	124.0	SM	<b>FILL:</b> Brown, damp, very dense, silty SAND with gravel.				
10	27/6" 40/6" 50/6"	8.8	116.1		Trace clay.				
15	18/6" 28/6" 32/6"	7.5	122.8		Dense.				
20									



**BORING LOG**

ITS INFRASTRUCTURE IMPROVEMENTS FOR BRUCE WOODBURY BELTWAY,  
WINDMILL LANE TO INTERSTATE 515, CLARK COUNTY, NEVADA

PROJECT NO.	DATE	FIGURE
303175001	4/11	A-13

DEPTH (feet)	Bulk	BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>2/7/11</u>	BORING NO. <u>Appendix G (B-3)</u>
	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>2</u> OF <u>3</u>
							METHOD OF DRILLING <u>Mayhew 1000 air-rotary drill rig</u>	
							DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u>	DROP <u>30"</u>
							SAMPLED BY <u>RDB</u> LOGGED BY <u>RDB</u> REVIEWED BY <u>EDE</u>	
<b>DESCRIPTION/INTERPRETATION</b>								

20			7.0	112.5		SM	<p><b>FILL (continued):</b> Brown, damp, very dense, silty SAND with gravel and small boulders.</p>	
25	X	50/4"					<p>Sampler refusal after 4 inches. Boulder.</p>	
30		20/6" 50/3"	10.1	118.9			<p>Sampler refusal after 9 inches.</p>	
35		23/6" 50/4"	-	-			<p>Sampler refusal after 10 inches.</p>	
40								



**BORING LOG**

ITS INFRASTRUCTURE IMPROVEMENTS FOR BRUCE WOODBURY BELTWAY,  
WINDMILL LANE TO INTERSTATE 515, CLARK COUNTY, NEVADA

PROJECT NO.  
303175001

DATE  
4/11

FIGURE  
A-14

DEPTH (feet)	SAMPLES		BLOWS	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.	
	Bulk	Driven						2/7/11	Appendix G (B-3)	
								GROUND ELEVATION	SHEET	OF
								METHOD OF DRILLING		
								DRIVE WEIGHT	DROP	
								SAMPLED BY	LOGGED BY	REVIEWED BY
								<b>DESCRIPTION/INTERPRETATION</b>		
40			22/6" 32/6" 42/6"	3.6	109.5		GP	<p><b>FILL (continued):</b> Brown, damp, very dense, poorly graded GRAVEL with sand and boulders.</p>		
								<p>Total depth = 41.5 feet. Groundwater not encountered during drilling. Backfilled and patched on 2/7/11.</p> <p><b>NOTE:</b> Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.</p>		
45										
50										
55										
60										



**BORING LOG**

ITS INFRASTRUCTURE IMPROVEMENTS FOR BRUCE WOODBURY BELTWAY,  
WINDMILL LANE TO INTERSTATE 515, CLARK COUNTY, NEVADA

PROJECT NO.  
303175001

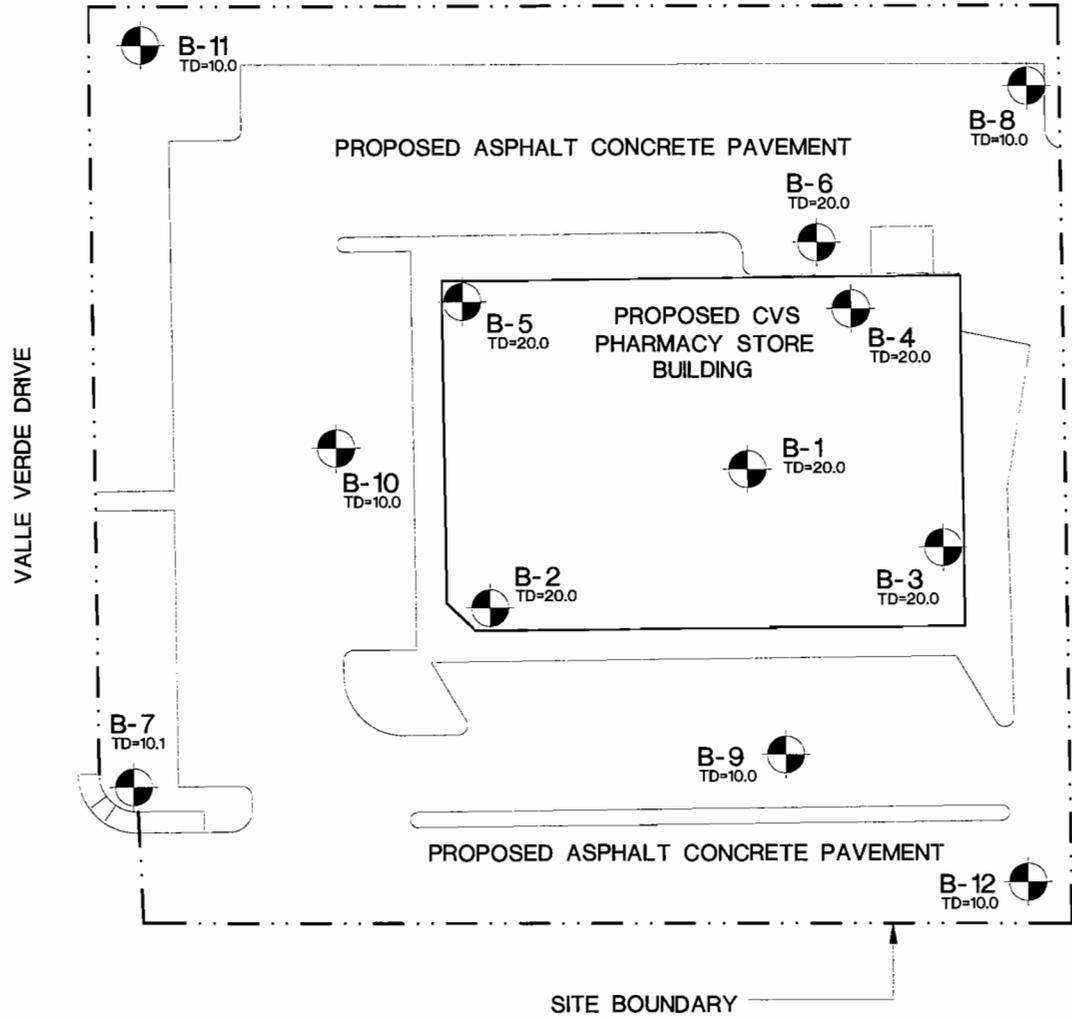
DATE  
4/11

FIGURE  
A-15



# APPENDIX H

## I-215 East of I-515 North

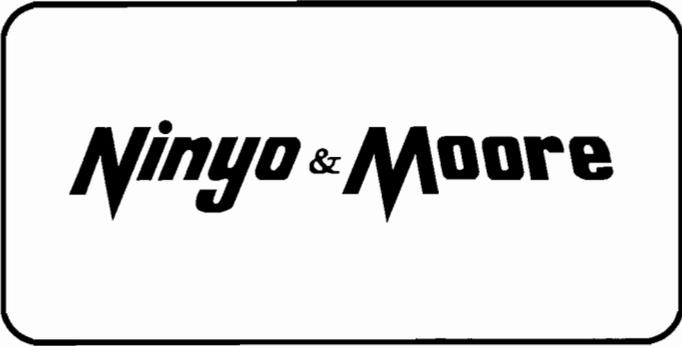
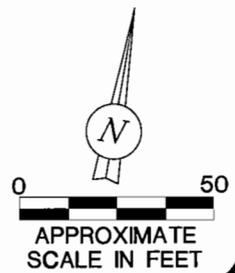


**LEGEND**

-  B-12 TD=10.0 Approximate location of exploratory boring.
- TD indicates total depth of exploratory boring, in feet.

REFERENCE: Carter Burgess, 2003, Proposed CVS Site Plan, Northeast Corner of Interstate 215 and Valle Verde Drive: print date March 6.

NOTE: All dimensions and directions are approximate



**BORING LOCATION MAP**

Proposed CVS Pharmacy Store  
I-215 and Valle Verde Drive  
Henderson, Nevada

PROJECT NO. 301228001	DATE 04/2003
--------------------------	-----------------

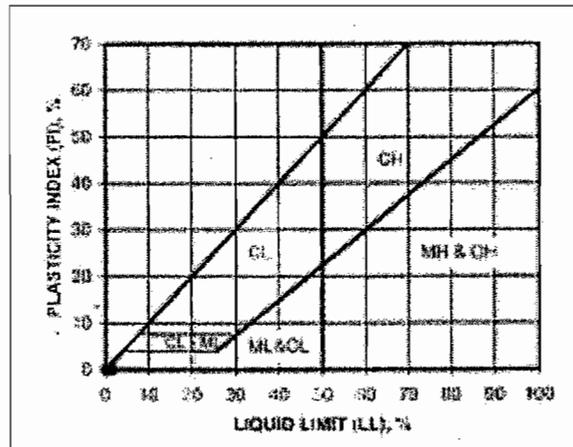
FIGURE  
**2**

U.S.C.S. METHOD OF SOIL CLASSIFICATION			
MAJOR DIVISIONS	SYMBOL	TYPICAL NAMES	
COARSE-GRAINED SOILS (More than 1/2 of soil >No. 200 sieve size)	GRAVELS (More than 1/2 of coarse fraction > No. 4 sieve size)	GW	Well graded gravels or gravel-sand mixtures little or no fines
		GP	Poorly graded gravels or gravel-sand mixtures, little or no fines
		GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
	SANDS (More than 1/2 of coarse fraction <No. 4 sieve size)	SW	Well graded sands or gravelly sands, little or no fines
		SP	Poorly graded sands or gravelly sands, little or no fines
		SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (More than 1/2 of soil <No. 200 sieve size)	SILTS & CLAYS Liquid Limit <50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		OL	Organic silts and organic silty clays of low plasticity
	SILTS & CLAYS Liquid Limit >50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silty clays, organic silts
HIGHLY ORGANIC SOILS	Pt	Peat and other highly organic soils	

**CLASSIFICATION CHART (Unified Soil Classification System)**

CLASSIFICATION	RANGE OF GRAIN SIZES	
	U.S. Standard Sieve Size	Grain Size in Millimeters
<b>BOULDERS</b>	Above 12"	Above 305
<b>COBBLES</b>	12" to 3"	305 to 76.2
<b>GRAVEL</b>	3" to No.4	76.2 to 4.76
	Coarse 3" to 3/4"	76.2 to 19.1
	Fine 3/4" to No. 4	19.1 to 4.76
<b>SAND</b>	No. 4 to No. 200	4.76 to 0.074
	Coarse No. 4 to No. 10	4.76 to 2.00
	Medium No. 10 to No. 40	2.00 to 0.420
	Fine No. 40 to No. 200	0.420 to 0.074
<b>SILT &amp; CLAY</b>	Below No. 200	Below 0.074

GRAIN SIZE CHART



PLASTICITY CHART

<b>Ninyo &amp; Moore</b>	U.S.C.S. METHOD OF SOIL CLASSIFICATION
--------------------------	--

# BORING LOG EXPLANATION SHEET

DEPTH (feet)	Bulk Samples Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	
0	■						Bulk sample.
	■						Modified split-barrel drive sampler.
	□						No recovery with modified split-barrel drive sampler.
	■						Sample retained by others.
	■						Standard Penetration Test (SPT).
5	□						No recovery with a SPT.
	□	XX/XX					Shelby tube sample. Distance pushed in inches/length of sample recovered in inches.
	□						No recovery with Shelby tube sampler.
	□						Continuous Push Sample.
	□		∞				Seepage.
10	□						Groundwater encountered during drilling.
	□						Groundwater measured after drilling.
					■	SM	ALLUVIUM: Solid line denotes unit change.
							Dashed line denotes material change.
15							Attitudes: Strike/Dip b: Bedding c: Contact j: Joint f: Fracture F: Fault cs: Clay Seam s: Shear bss: Basal Slide Surface sf: Shear Fracture sz: Shear Zone sbs: Sheared Bedding Surface
20							The total depth line is a solid line that is drawn at the bottom of the boring.



## BORING LOG

### EXPLANATION OF BORING LOG SYMBOLS

PROJECT NO.

DATE  
Rev. 01/03

FIGURE  
A-0

DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/14/2003</u>	BORING NO. <u>B-1</u>
	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>2</u>
							METHOD OF DRILLING <u>6" diameter air-rotary</u>	
							DRIVE WEIGHT <u>140 lbs.</u>	DROP <u>30"</u>
							SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>								

0						GP-GM	<b>FILL:</b> Brown, damp, dense, poorly graded fine and coarse GRAVEL with silt, sand, and cobbles; scattered concrete pieces.	
	50/2"		4.9			SW-SM	<b>ALLUVIUM:</b> Brown, damp, very dense, well-graded fine to coarse SAND with silt and fine and coarse gravel; slightly cemented. Sampler refusal after 2".	
5	50/3"						Sampler refusal after 3"; few cobbles and small boulders.	
	50/4"						Sampler refusal after 4".	
10								
	50/3"						Sampler refusal after 3".	
15								
20							Brown, damp, hard, CALICHE; strongly cemented; composed primarily of coarse-grained material.	



<b>BORING LOG</b>		
Proposed CVS Pharmacy Store I-215 and Valle Verde Drive, Henderson, Nevada		
PROJECT NO. 301228001	DATE 04/2003	FIGURE A-1

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/14/2003</u>	BORING NO. <u>B-1</u>
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>2</u> OF <u>2</u>
								METHOD OF DRILLING <u>6" diameter air-rotary</u>	
								DRIVE WEIGHT <u>140 lbs.</u>	DROP <u>30"</u>
								SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>	

DEPTH (feet)		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
20							Total depth = 20.0 feet. Groundwater not encountered during drilling. Backfilled on 03/14/2003.
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							



BORING LOG		
Proposed CVS Pharmacy Store I-215 and Valle Verde Drive, Henderson, Nevada		
PROJECT NO. 301228001	DATE 04/2003	FIGURE A-2

DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/14/2003</u>	BORING NO. <u>B-2</u>
	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>2</u>
							METHOD OF DRILLING <u>6" diameter air-rotary</u>	
							DRIVE WEIGHT <u>140 lbs.</u>	DROP <u>30"</u>
							SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>								

0						GP-GM	<p><b>ALLUVIUM:</b> Brown, damp, very dense, poorly graded fine and coarse GRAVEL with silt, sand, cobbles, and small boulders. Sampler refusal after 3".</p> <p>Slightly cemented.</p> <p>Decrease in cementation.</p> <p>Sampler refusal after 5".</p>
5	50/3"						
	50/5"						
							Brown, damp, hard, CALICHE; strongly cemented; composed primarily of coarse-grained material.
10						GP	<p>Brown, damp, very dense, poorly graded fine and coarse GRAVEL with cobbles and small boulders; few sand; trace silt; scattered thin moderately hard, moderately cemented layers.</p> <p>Sampler refusal after 6".</p>
	50/6"						
15							
20							



**BORING LOG**

Proposed CVS Pharmacy Store  
I-215 and Valle Verde Drive, Henderson, Nevada

PROJECT NO.  
301228001

DATE  
04/2003

FIGURE  
A-3

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/14/2003</u>	BORING NO. <u>B-2</u>
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>2</u> OF <u>2</u>
								METHOD OF DRILLING <u>6" diameter air-rotary</u>	
								DRIVE WEIGHT <u>140 lbs.</u>	DROP <u>30"</u>
								SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>	

**DESCRIPTION/INTERPRETATION**

20	Total depth = 20.0 feet. Groundwater not encountered during drilling. Backfilled on 03/14/2003.							
25								
30								
35								
40								



**BORING LOG**

Proposed CVS Pharmacy Store  
I-215 and Valle Verde Drive, Henderson, Nevada

PROJECT NO. 301228001	DATE 04/2003	FIGURE A-4
--------------------------	-----------------	---------------

DEPTH (feet)	Bulk	BLOWNS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/14/2003</u>	BORING NO. <u>B-3</u>
	Driven						SAMPLES	GROUND ELEVATION <u>Not measured</u>
							METHOD OF DRILLING <u>6" diameter air-rotary</u>	
							DRIVE WEIGHT <u>140 lbs.</u>	DROP <u>30"</u>
							SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>								

0						SM	FILL: Brown, damp, medium dense, silty fine to coarse SAND.	
						GM	Brown, damp, dense, silty fine and coarse GRAVEL with sand.	
						GP-GM	ALLUVIUM: Brown, damp, very dense, poorly graded fine and coarse GRAVEL with silt, sand, and cobbles.	
							Brown, damp, hard, CALICHE; strongly cemented; composed primarily of coarse-grained material.	
5						GM	Brown, damp, very dense, silty fine and coarse GRAVEL with sand. Sampler refusal after 4".	
	50/4"						Brown, damp, moderately hard, CALICHE; moderately cemented; composed primarily of coarse-grained material.	
10						GP-GM	Brown, damp, very dense, poorly graded fine and coarse GRAVEL with silt, sand, and cobbles. Sampler refusal after 6".	
	50/6"						Brown, damp, moderately hard, CALICHE; moderately cemented; composed primarily of coarse-grained material.	
15						GP-GM	Brown, damp, very dense, poorly graded fine and coarse GRAVEL with silt, sand, cobbles, and small boulders.	
20								



**BORING LOG**

Proposed CVS Pharmacy Store  
I-215 and Valle Verde Drive, Henderson, Nevada

PROJECT NO.  
301228001

DATE  
04/2003

FIGURE  
A-5

DEPTH (feet)	Bulk	SAMPLES	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/14/2003</u>	BORING NO. <u>B-3</u>
	Driven							GROUND ELEVATION <u>Not measured</u>	SHEET <u>2</u> OF <u>2</u>
								METHOD OF DRILLING <u>6" diameter air-rotary</u>	
								DRIVE WEIGHT <u>140 lbs.</u>	DROP <u>30"</u>
								SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>									

20								Total depth = 20.0 feet. Groundwater not encountered during drilling. Backfilled on 03/14/2003.	
25									
30									
35									
40									



<b>BORING LOG</b>		
Proposed CVS Pharmacy Store I-215 and Valle Verde Drive, Henderson, Nevada		
PROJECT NO. 301228001	DATE 04/2003	FIGURE A-6

DEPTH (feet)	Bulk	SAMPLES	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	03/14/2003	BORING NO.	B-4				
	Driven							GROUND ELEVATION	Not measured	SHEET	1	OF	2		
								METHOD OF DRILLING				6" diameter air-rotary			
								DRIVE WEIGHT				140 lbs.			
								DROP				30"			
								SAMPLED BY				BOM			
								LOGGED BY				BOM			
								REVIEWED BY				BDB			
<b>DESCRIPTION/INTERPRETATION</b>															

0							GP-GM	<b>FILL:</b> Brown, damp, dense, poorly graded fine and coarse GRAVEL with silt and sand.
							GP	<b>ALLUVIUM:</b> Brown, damp, dense to very dense, poorly graded fine and coarse GRAVEL with cobbles; few sand; trace silt. Brown, damp, hard to very hard, CALICHE; strongly cemented; composed primarily of coarse-grained material.
5							GP-GM	Brown, damp, dense, poorly graded fine and coarse GRAVEL with silt, sand, cobbles, and small boulders. Brown, damp, hard to very hard, CALICHE; strongly cemented; composed primarily of coarse-grained material.
							GP-GM	Brown, damp, dense, poorly graded fine and coarse GRAVEL with silt, sand, cobbles, and small boulders. Brown, damp, moderately hard, CALICHE; moderately cemented; composed primarily of coarse-grained material.
10							GM	Brown, damp, dense, silty fine and coarse GRAVEL with sand and cobbles.
15							GP-GM	Brown, damp, moderately hard, CALICHE; moderately cemented; composed primarily of coarse-grained material.  Hard; strongly cemented.
20							GP-GM	Brown, damp, dense, poorly graded fine and coarse GRAVEL with silt, sand, cobbles, and small boulders.



**BORING LOG**

Proposed CVS Pharmacy Store  
I-215 and Valle Verde Drive, Henderson, Nevada

PROJECT NO.  
301228001

DATE  
04/2003

FIGURE  
A-7

DEPTH (feet)	Bulk	SAMPLES	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/14/2003</u>	BORING NO. <u>B-4</u>
	Driven							GROUND ELEVATION <u>Not measured</u>	SHEET <u>2</u> OF <u>2</u>
METHOD OF DRILLING <u>6" diameter air-rotary</u>								DRIVE WEIGHT <u>140 lbs.</u>	DROP <u>30"</u>
SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>								<b>DESCRIPTION/INTERPRETATION</b>	

20								Total depth = 20.0 feet. Groundwater not encountered during drilling. Backfilled on 03/14/2003.	
25									
30									
35									
40									



**BORING LOG**

Proposed CVS Pharmacy Store  
I-215 and Valle Verde Drive, Henderson, Nevada

PROJECT NO.  
301228001

DATE  
04/2003

FIGURE  
A-8



DEPTH (feet)	Bulk	SAMPLES	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/14/2003</u>	BORING NO. <u>B-5</u>
	Driven							GROUND ELEVATION <u>Not measured</u>	SHEET <u>2</u> OF <u>2</u>
								METHOD OF DRILLING <u>6" diameter air-rotary</u>	
								DRIVE WEIGHT <u>140 lbs.</u>	DROP <u>30"</u>
								SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>									

20								Total depth = 20.0 feet. Groundwater not encountered during drilling. Backfilled on 03/14/2003.	
25									
30									
35									
40									



<b>BORING LOG</b>		
Proposed CVS Pharmacy Store I-215 and Valle Verde Drive, Henderson, Nevada		
PROJECT NO. 301228001	DATE 04/2003	FIGURE A-10

DEPTH (feet)	Bulk	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/14/2003</u>	BORING NO. <u>B-6</u>
	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>2</u>
							METHOD OF DRILLING <u>6" diameter air-rotary</u>	
							DRIVE WEIGHT <u>140 lbs.</u>	DROP <u>30"</u>
							SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>								

0						GP-GM	<u>FILL:</u> Brown, damp, dense, poorly graded fine and coarse GRAVEL with silt and sand.
						GP	<u>ALLUVIUM:</u> Brown, damp, dense to very dense, poorly graded fine and coarse GRAVEL with cobbles; few sand; trace silt.
							Brown, damp, hard to very hard, CALICHE; strongly cemented; composed primarily of coarse-grained material.
5						GP	Brown, damp, dense, poorly graded fine and coarse GRAVEL with cobbles and small boulders; few sand; trace silt.
10							
15							
							Brown, damp, hard to very hard, CALICHE; strongly cemented; composed primarily of coarse-grained material.
20						GP	Brown, damp, dense, poorly graded fine and coarse GRAVEL with cobbles and small



BORING LOG		
Proposed CVS Pharmacy Store I-215 and Valle Verde Drive, Henderson, Nevada		
PROJECT NO. 301228001	DATE 04/2003	FIGURE A-11

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/14/2003</u>	BORING NO. <u>B-6</u>
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>2</u> OF <u>2</u>
								METHOD OF DRILLING <u>6" diameter air-rotary</u>	
								DRIVE WEIGHT <u>140 lbs.</u>	DROP <u>30"</u>
								SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>	

**DESCRIPTION/INTERPRETATION**

20	boulders; few sand; trace silt. Total depth = 20.0 feet. Groundwater not encountered during drilling. Backfilled on 03/14/2003.							
25								
30								
35								
40								



BORING LOG		
Proposed CVS Pharmacy Store I-215 and Valle Verde Drive, Henderson, Nevada		
PROJECT NO. 301228001	DATE 04/2003	FIGURE A-12

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.				
	Bulk	Driven						03/14/2003	B-7				
								GROUND ELEVATION	SHEET	OF			
								METHOD OF DRILLING	6" diameter air-rotary				
								DRIVE WEIGHT	140 lbs.	DROP	30"		
								SAMPLED BY	BOM	LOGGED BY	BOM	REVIEWED BY	BDB
<b>DESCRIPTION/INTERPRETATION</b>													
0							GP	<b>FILL:</b> Brown, damp, dense, poorly graded fine and coarse GRAVEL with cobbles; few sand; trace silt.					
			50/4"				GP	<b>ALLUVIUM:</b> Brown, damp, very dense, poorly graded fine and coarse GRAVEL with cobbles and small boulders; few sand; trace silt. Sampler refusal after 4".					
5			50/3"					Sampler refusal after 3".					
								Brown, damp, hard, CALICHE; strongly cemented; composed primarily of coarse-grained material.					
							GP	Brown, damp, very dense, poorly graded fine and coarse GRAVEL with cobbles and boulders; few sand; trace silt.					
10			50/2"					Sampler refusal after 2" Total depth = 10.1 feet. Groundwater not encountered during drilling. Backfilled on 03/14/2003.					
15													
20													



**BORING LOG**

Proposed CVS Pharmacy Store  
I-215 and Valle Verde Drive, Henderson, Nevada

PROJECT NO.  
301228001

DATE  
04/2003

FIGURE  
A-13

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/14/2003</u>	BORING NO. <u>B-8</u>
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>1</u>
METHOD OF DRILLING <u>6" diameter air-rotary</u>								DRIVE WEIGHT <u>140 lbs.</u>	DROP <u>30"</u>
SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>								<b>DESCRIPTION/INTERPRETATION</b>	

0							GP-GM	FILL: Brown, damp, dense, poorly graded fine and coarse GRAVEL with silt and sand.
							GP	ALLUVIUM: Brown, damp, dense, poorly graded fine and coarse GRAVEL with cobbles; few sand; trace silt.
								Brown, damp, hard, CALICHE; strongly cemented; composed primarily of coarse-grained material.
5							GP-GM	Brown, damp, very dense, poorly graded fine and coarse GRAVEL with silt, sand, cobbles, and small boulders.
10								Total depth = 10.0 feet. Groundwater not encountered during drilling. Backfilled on 03/14/2003.
15								
20								



**BORING LOG**

Proposed CVS Pharmacy Store  
I-215 and Valle Verde Drive, Henderson, Nevada

PROJECT NO.  
301228001

DATE  
04/2003

FIGURE  
A-14

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.				
	Bulk	Driven						03/14/2003	B-9				
								GROUND ELEVATION	SHEET	OF			
								Not measured	1	1			
								METHOD OF DRILLING	6" diameter air-rotary				
								DRIVE WEIGHT	140 lbs.	DROP	30"		
								SAMPLED BY	BOM	LOGGED BY	BOM	REVIEWED BY	BDB
								<b>DESCRIPTION/INTERPRETATION</b>					
0							GP	<b>ALLUVIUM:</b> Brown, damp, very dense, poorly graded fine and coarse GRAVEL with cobbles and small boulders; few sand; trace silt.					
5													
10								Total depth = 10.0 feet. Groundwater not encountered during drilling. Backfilled on 03/14/2003.					
15													
20													



**BORING LOG**

Proposed CVS Pharmacy Store  
 I-215 and Valle Verde Drive, Henderson, Nevada

PROJECT NO.  
 301228001

DATE  
 04/2003

FIGURE  
 A-15

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED	BORING NO.	
	Bulk	Driven						03/14/2003	B-10	
								GROUND ELEVATION	SHEET	OF
								METHOD OF DRILLING		
								DRIVE WEIGHT	DROP	
								SAMPLED BY	LOGGED BY	REVIEWED BY
								<b>DESCRIPTION/INTERPRETATION</b>		
0							GP	<b>ALLUVIUM:</b> Brown, damp, very dense, poorly graded fine and coarse GRAVEL with cobbles and boulders; few sand; trace silt.		
			50/5"					Sampler refusal after 5".		
							SW-SM	Brown, damp, very dense, well-graded fine to coarse SAND with silt and fine gravel.		
5			50/5"	7.2				Sampler refusal after 5".		
								Brown, damp, hard to very hard, CALICHE; strongly cemented; composed primarily of coarse-grained material.		
							GP	Brown, damp, very dense, poorly graded fine and coarse GRAVEL with cobbles and boulders; few sand; trace silt.		
10								Total depth = 10.0 feet. Groundwater not encountered during drilling. Backfilled on 03/14/2003.		
15										
20										



**BORING LOG**

Proposed CVS Pharmacy Store  
I-215 and Valle Verde Drive, Henderson, Nevada

PROJECT NO.  
301228001

DATE  
04/2003

FIGURE  
A-16

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/14/2003</u> BORING NO. <u>B-11</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>6" diameter air-rotary</u>	
								DRIVE WEIGHT <u>140 lbs.</u> DROP <u>30"</u>	
								SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>									
0						GP-GM		<b>FILL:</b> Brown, damp, medium dense, poorly graded fine and coarse GRAVEL with silt, sand, and cobbles.	
5			84/11"			GP		<b>ALLUVIUM:</b> Brown, damp, very dense, poorly graded fine and coarse GRAVEL with cobbles and boulders; few sand; trace silt.  Sampler refusal after 17".  Slightly cemented.  Decrease in cementation. Sampler refusal after 4".	
10			50/4"					Total depth = 10.0 feet. Groundwater not encountered during drilling. Backfilled on 03/14/2003.	
15									
20									



**BORING LOG**

Proposed CVS Pharmacy Store  
I-215 and Valle Verde Drive, Henderson, Nevada

PROJECT NO.  
301228001

DATE  
04/2003

FIGURE  
A-17

DEPTH (feet)	Bulk	SAMPLES	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>03/14/2003</u>	BORING NO. <u>B-12</u>
	Driven							GROUND ELEVATION <u>Not measured</u>	SHEET <u>1</u> OF <u>1</u>
METHOD OF DRILLING <u>6" diameter air-rotary</u>								DRIVE WEIGHT <u>140 lbs.</u>	DROP <u>30"</u>
SAMPLED BY <u>BOM</u>								LOGGED BY <u>BOM</u>	REVIEWED BY <u>BDB</u>
<b>DESCRIPTION/INTERPRETATION</b>									

0					GW-GM	<u>ALLUVIUM:</u> Brown, damp, very dense, well-graded fine and coarse GRAVEL with silt, sand, cobbles, and small boulders.
5					GM	Brown, damp, dense, silty fine and coarse GRAVEL with sand and cobbles.
10						Total depth = 10.0 feet. Groundwater not encountered during drilling. Backfilled on 03/14/2003.
15						
20						



<b>BORING LOG</b>		
Proposed CVS Pharmacy Store I-215 and Valle Verde Drive, Henderson, Nevada		
PROJECT NO. 301228001	DATE 04/2003	FIGURE A-18



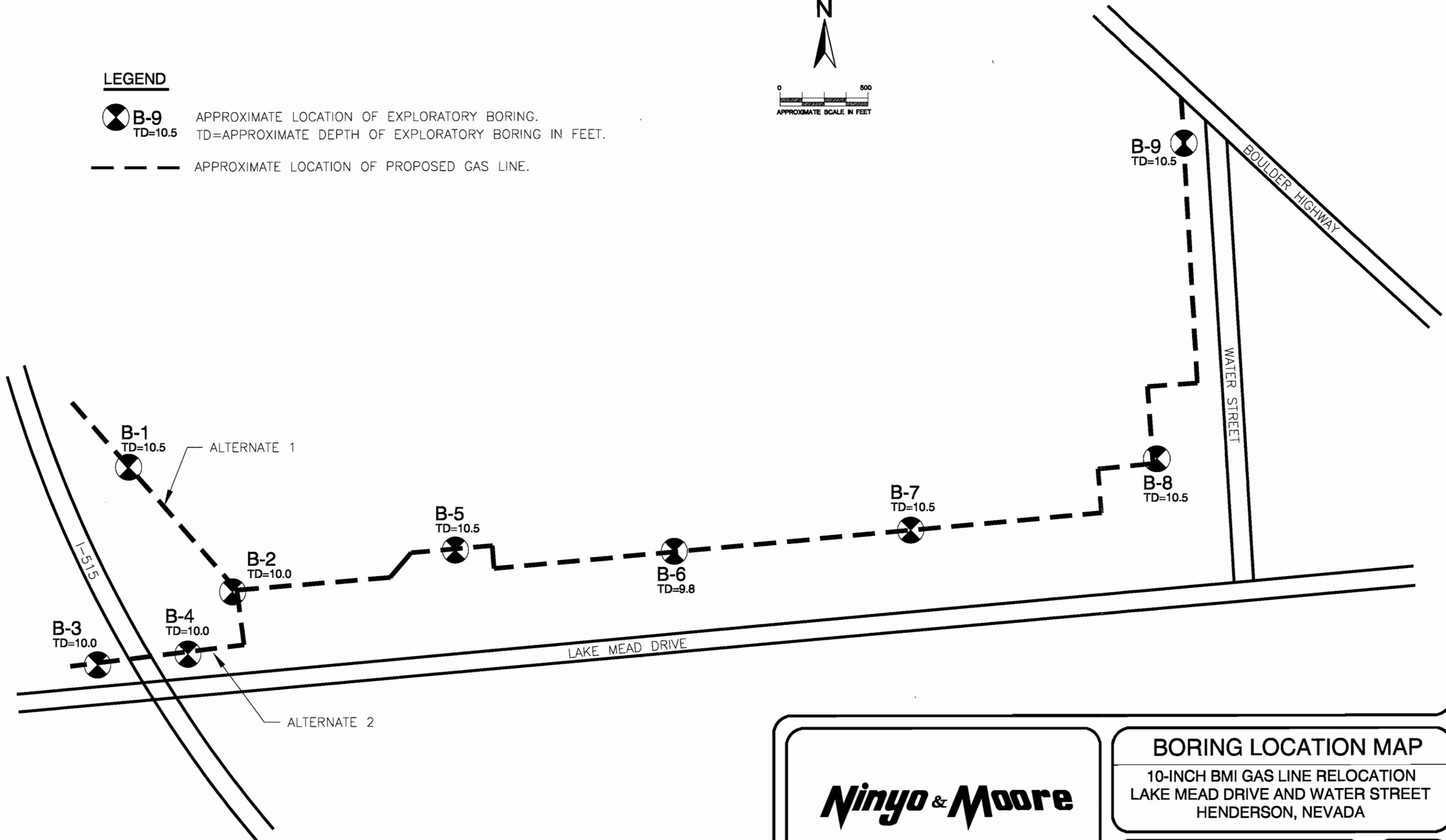
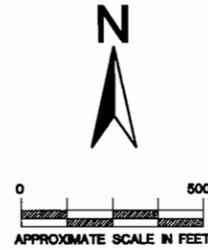
# APPENDIX I

## I-215 East of I-515 North

**LEGEND**

 **B-9**  
TD=10.5 APPROXIMATE LOCATION OF EXPLORATORY BORING.  
TD=APPROXIMATE DEPTH OF EXPLORATORY BORING IN FEET.

--- APPROXIMATE LOCATION OF PROPOSED GAS LINE.



**Ninyo & Moore**

**BORING LOCATION MAP**

10-INCH BMI GAS LINE RELOCATION  
LAKE MEAD DRIVE AND WATER STREET  
HENDERSON, NEVADA

PROJECT NO.  
300293-01

DATE  
10/98

FIGURE  
2

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/08/98</u> BORING NO. <u>B-1</u>		
	Bulk	Driven						GROUND ELEVATION <u>Not Measured</u>	SHEET <u>1</u> OF <u>1</u>	METHOD OF DRILLING <u>6" Diameter Air-Rotary</u>
								DRIVE WEIGHT <u>320 lbs.</u>	DROP <u>30"</u>	
								SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>		
<b>DESCRIPTION/INTERPRETATION</b>										
0							SW-SM	<b>ALLUVIUM:</b> Dark brown, dry, dense to very dense, well-graded fine to coarse SAND with silt and gravel; a few cobbles and small boulders; some gravel slightly encrusted with gypsum. Slightly cemented layer approximately 1.5 feet thick.		
			56					Sampler refusal after 12".		
5							SP-SM	Dark brown, damp, very dense, poorly graded fine to coarse SAND with silt and gravel; a few cobbles.		
			52	7.4	112.4			Sampler refusal after 12".		
							GP/SP	Dark brown, damp, dense, poorly graded fine to coarse GRAVEL with sand to SAND with gravel; trace silt.		
10			44	6.8	124.3					
								Total Depth = 10.5 feet. No caving. No groundwater encountered. Backfilled on 09/08/98.		
15										
20										

	<b>BORING LOG</b>		
	10-Inch BMI Gas Line Relocation Lake Mead Drive and Water Street, Henderson, Nevada		
	PROJECT NO. 300293-01	DATE 10/98	FIGURE A-1

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/08/98</u> BORING NO. <u>B-2</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not Measured</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>6" Diameter Air-Rotary</u>	
								DRIVE WEIGHT <u>320 lbs.</u> DROP <u>30"</u>	
								SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>									
0							GP-GM	<u>FILL:</u> Brown, dry, medium dense, poorly graded fine to coarse GRAVEL with silt and sand; a few cobbles.	
							GP-GM	<u>ALLUVIUM:</u> Brown, dry, medium dense to dense, poorly graded fine to coarse GRAVEL with silt and sand; a few cobbles.	
			32	3.4	115.7				
5								50/5" Sampler refusal after 5"; slightly cemented.	
								Moderately hard, moderately cemented gravel layer approximately 6" thick. Slightly cemented; increase in sand content.	
10								Total Depth = 10.0 feet. Slight caving occurred between 0 and 6 feet. No groundwater encountered. Backfilled on 09/08/98.	
15									
20									



## BORING LOG

10-Inch BMI Gas Line Relocation  
 Lake Mead Drive and Water Street, Henderson, Nevada

PROJECT NO. 300293-01	DATE 10/98	FIGURE A-2
--------------------------	---------------	---------------

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/14/98</u> BORING NO. <u>B-3</u>		
	Bulk	Driven						GROUND ELEVATION <u>Not Measured</u>	SHEET <u>1</u> OF <u>1</u>	METHOD OF DRILLING <u>6" Diameter Air-Rotary</u>
								DRIVE WEIGHT <u>320 lbs.</u>	DROP <u>30"</u>	
								SAMPLED BY <u>BOM</u>	LOGGED BY <u>BOM</u>	REVIEWED BY <u>BDB</u>
<b>DESCRIPTION/INTERPRETATION</b>										
0							GP-GM	<u>FILL:</u> Light brown, dry, medium dense to dense, poorly graded fine to coarse GRAVEL with silt and sand; a few cobbles.  Medium dense.		
5			26							
10			50/6"				GP-GM	<u>ALLUVIUM:</u> Light brown, dry, dense, poorly graded fine to coarse GRAVEL with silt and sand. Sampler refusal after 6".		
15								Total Depth = 10.0 feet. No caving. No groundwater encountered. Backfilled on 09/14/98.		
20										

	<b>BORING LOG</b>		
	10-Inch BMI Gas Line Relocation Lake Mead Drive and Water Street, Henderson, Nevada		
	PROJECT NO. 300293-01	DATE 10/98	FIGURE A-3

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/14/98</u> BORING NO. <u>B-4</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not Measured</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>6" Diameter Air-Rotary</u>	
								DRIVE WEIGHT <u>320 lbs.</u>	DROP <u>30"</u>
								SAMPLED BY <u>BOM</u>	LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>
<b>DESCRIPTION/INTERPRETATION</b>									
0							GP-GM	<b>FILL:</b> Light brown, dry, medium dense to dense, poorly graded fine to coarse GRAVEL with silt and sand; a few pieces of asphalt.	
							SW-SM	<b>ALLUVIUM:</b> Light brown, dry to damp, dense to very dense, well-graded fine to coarse SAND with silt and gravel.	
5			37						
								Sampler refusal after 6".	
10			38 1/6"						
								Total Depth = 10.0 feet. No caving. No groundwater encountered. Backfilled on 09/14/98.	
15									
20									



<b>BORING LOG</b>		
10-Inch BMI Gas Line Relocation Lake Mead Drive and Water Street, Henderson, Nevada		
PROJECT NO. 300293-01	DATE 10/98	FIGURE A-4

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/08/98</u> BORING NO. <u>B-5</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not Measured</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>6" Diameter Air-Rotary</u>	
								DRIVE WEIGHT <u>320 lbs.</u> DROP <u>30"</u>	
								SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>									
0							SP	<b>FILL:</b> Dark brown, damp, dense, poorly graded fine to coarse SAND with gravel; trace silt.	
5			20	8.2			SW-SM	<b>ALLUVIUM:</b> Dark brown, damp, medium dense, well-graded fine to coarse SAND with silt and gravel.	
			39/10"	8.5	107.4		GP-GM	Dark brown, damp, dense to very dense, poorly graded fine to coarse GRAVEL with silt and sand. Sampler refusal after 16".	
10			37	7.6	110.2		SM	Light brown, damp, dense, silty fine to coarse SAND; few gravel.	
15								Total Depth = 10.5 feet. No caving. No groundwater encountered. Backfilled on 09/08/98.	
20									



<b>BORING LOG</b>		
10-Inch BMI Gas Line Relocation Lake Mead Drive and Water Street, Henderson, Nevada		
PROJECT NO. 300293-01	DATE 10/98	FIGURE A-5

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/14/98</u> BORING NO. <u>B-6</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not Measured</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>6" Diameter Air-Rotary</u>	
								DRIVE WEIGHT <u>320 lbs.</u> DROP <u>30"</u>	
								SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>	
<b>DESCRIPTION/INTERPRETATION</b>									
0							GP-GM	<u>FILL:</u> Light brown, dry, medium dense to dense, poorly graded fine to coarse GRAVEL with silt and sand; a few pieces of asphalt.	
5			22	7.4	98.4		GP-GM	<u>ALLUVIUM:</u> Light brown, dry, medium dense, poorly graded fine to coarse GRAVEL with silt and sand.	
			30/2"					Dense; sampler refusal on cobble after 2".	
10			30/4"	5.6	109.1			Sampler refusal after 10".	
15								Total Depth = 9.8 feet. No caving. No groundwater encountered. Backfilled on 09/14/98.	
20									



<b>BORING LOG</b>		
10-Inch BMI Gas Line Relocation Lake Mead Drive and Water Street, Henderson, Nevada		
PROJECT NO. 300293-01	DATE 10/98	FIGURE A-6



DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>09/08/98</u> BORING NO. <u>B-8</u>		
	Bulk	Driven						GROUND ELEVATION <u>Not Measured</u>	SHEET <u>1</u> OF <u>1</u>	METHOD OF DRILLING <u>6" Diameter Air-Rotary</u>
								DRIVE WEIGHT <u>320 lbs.</u>	DROP <u>30"</u>	SAMPLED BY <u>BOM</u> LOGGED BY <u>BOM</u> REVIEWED BY <u>BDB</u>
<b>DESCRIPTION/INTERPRETATION</b>										
0							SM	<u>FILL:</u> Dark brown, damp, medium dense to dense, silty fine to coarse SAND; few gravel.		
							SP-SM	<u>ALLUVIUM:</u> Dark brown, damp, medium dense to dense, poorly graded fine to coarse SAND with silt and gravel; slightly gypsiferous.		
5			30	8.5	118.6			Dense to very dense.		
			55	9.8	104.5					
10			50	7.7	113.4					
15								Total Depth = 10.5 feet. No caving. No groundwater encountered. Backfilled on 09/08/98.		
20										



<b>BORING LOG</b>		
10-Inch BMI Gas Line Relocation Lake Mead Drive and Water Street, Henderson, Nevada		
PROJECT NO. 300293-01	DATE 10/98	FIGURE A-8



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ACT LAB NO: 8525(a)

DATE: September 27, 1998

PROJECT NO: 300293-01

P.O.:

ANALYZED BY: 

## WATER SOLUBLE SALT ANALYSIS IN SOIL

1:5 (soil:water) Aqueous Extraction

AWWA 3500-Na D., ASTM D 516

<u>Sample No.</u>	<u>Location</u>	<u>Depth (Feet)</u>	<u>Sodium (Percent)</u>	<u>Water Soluble Sulfate (SO<sub>4</sub>) (Percent)</u>	<u>Total Available Water Soluble Sodium Sulfate(Na<sub>2</sub>SO<sub>4</sub>) (Percent)</u>
	B-5	2-6	0.07	0.02	0.03
	B-9	0-4	0.07	0.04	0.06

Notes: The results for each constituent denote the percentage of that analyte, at a 1:5 (soil:water) extraction ratio, which is present in the soil. Sodium was determined by flame photometry, sulfate turbidimetrically, and sodium sulfate by calculation.



# APPENDIX J

## I-215 East of I-515 - South



DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION						
	Bulk	Driven						DATE DRILLED	BORING NO.	GROUND ELEVATION	SHEET	OF		
								9/26/13	B-1	Not Measured	1	OF	1	
								CME 75 hollow-stem auger drill rig						
								140 lbs. (auto trip hammer)		DROP			30"	
								SLM	LOGGED BY	SLM	REVIEWED BY			
0														<b>ASPHALT CONCRETE:</b> Unit is approximately 4-1/2 to 5 inches thick.
							GP-GM							<b>FILL MATERIAL:</b> Brown, damp, dense, poorly graded GRAVEL with silt and sand (base material); unit is approximately 8 inches thick.
							SM							<b>NATIVE SOIL:</b> Brown, damp, medium dense, silty SAND; trace gravel.
			6/6" 11/6" 13/6"	6.9	105.1									
5			6/6" 12/6" 15/6"	8.6	101.2		SP-SM							Brown, damp, medium dense, poorly graded SAND with gravel
10			20/6" 16/6" 20/6"	5.8	108.5									
														Very dense, with cobbles.
15			20/6" 34/6" 37/6"	5.2	110.7									
														Total depth = 16.5 feet. Groundwater not encountered during drilling. Backfilled and patched on 9/26/13.
														<b>NOTE:</b> Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.
20														



**BORING LOG**

CENTURYLINK MODULAR BUILDING  
681 WEST LAKE MEAD PARKWAY, HENDERSON, NEVADA

PROJECT NO.	DATE	FIGURE
303663001	10/13	A-1

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>9/26/13</u> BORING NO. <u>B-2</u> GROUND ELEVATION <u>Not Measured</u> SHEET <u>1</u> OF <u>1</u> METHOD OF DRILLING <u>CME 75 hollow-stem auger drill rig</u> DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u> DROP <u>30"</u> SAMPLED BY <u>SLM</u> LOGGED BY <u>SLM</u> REVIEWED BY _____		
	Bulk	Driven						DESCRIPTION/INTERPRETATION		
0							GP-GM	<b>ASPHALT CONCRETE:</b> Unit is approximately 4-1/2 to 5 inches thick.		
							SP-SM	<b>FILL MATERIAL:</b> Dark brown, damp, medium dense, poorly graded GRAVEL with silt and sand (base material) unit is approximately 6 inches thick.		
			5/6" 9/6" 10/6"	7.3	104.4			<b>NATIVE SOIL:</b> Dark brown, damp, medium dense, poorly graded SAND with silt and gravel.		
5			5/6" 10/6" 9/6"	8.4	101.4					
10			12/6" 26/6" 40/6"	6.5	104.2					
15			13/6" 20/6" 38/6"	4.7	111.9					
20								Total depth = 16.5 feet. Groundwater not encountered during drilling. Backfilled and patched on 9/26/13.  <b>NOTE:</b> Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.		



**BORING LOG**

CENTURYLINK MODULAR BUILDING  
 681 WEST LAKE MEAD PARKWAY, HENDERSON, NEVADA

PROJECT NO.	DATE	FIGURE
303663001	10/13	A-2

DEPTH (feet)	SAMPLES		BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DATE DRILLED <u>9/26/13</u> BORING NO. <u>B-3</u>	
	Bulk	Driven						GROUND ELEVATION <u>Not Measured</u>	SHEET <u>1</u> OF <u>1</u>
								METHOD OF DRILLING <u>CME 75 hollow-stem auger drill rig</u>	
								DRIVE WEIGHT <u>140 lbs. (auto trip hammer)</u> DROP <u>30"</u>	
								SAMPLED BY <u>SLM</u> LOGGED BY <u>SLM</u> REVIEWED BY _____	
									<b>DESCRIPTION/INTERPRETATION</b>
0							SP-SM	<p><b>NATIVE SOIL:</b> Brown, damp, loose, poorly graded SAND with silt and gravel. Medium dense.</p>	
			8/6" 12/6" 15/6"	8.8	103.1				
5			10/6" 18/6" 20/6"	8.9	106.8				
10			50/5"					<p>Very dense. Total depth = 10.4 feet. Groundwater not encountered during drilling. Backfilled on 9/26/13.</p>	
								<p><u>NOTE:</u> Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.</p>	
15									
20									



**BORING LOG**

CENTURYLINK MODULAR BUILDING  
681 WEST LAKE MEAD PARKWAY, HENDERSON, NEVADA

PROJECT NO. 303663001	DATE 10/13	FIGURE A-3
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