Project No. S9843-05-01
December 6, 2013

John C. Griffin
Del Paso Homes
4120 Douglas Blvd. #306-375
Granite Bay, California 95746

Subject: PRELIMINARY GEOTECHNICAL EVALUATION
SILVER EAGLE PROPERTY– WESTERN AVENUE AT FORD ROAD
SACRAMENTO COUNTY, CALIFORNIA

Dear Mr. Griffin:

In accordance with your request, this letter summarizes our preliminary geotechnical evaluation for the subject project site. The proposed project consists of single-family residential development on approximately 6 acres of currently vacant land located near the intersection of Western Avenue and Ford Road in the Del Paso Heights area of Sacramento, California. The site is further identified by Sacramento County Assessor's Parcel Numbers (APNs) 250-0172-002-0000, 250-0172-025-0000, and 250-0172-027-0000. The approximate site location is shown on the Vicinity Map, Figure 1.

The information provided in this letter is based on a limited field reconnaissance, review of available information, limited soil sampling and laboratory testing, and our geotechnical experience in the project area. This letter is intended for your project planning and due-diligence purposes only. Additional geotechnical investigation will be required for project design.

## SITE AND PROJECT DESCRIPTION

We performed a site reconnaissance on November 4, 2013, to observe existing conditions. The approximate 6-acre site is bordered by Silver Eagle Road to the north, Western Avenue to the west, Ford Road to the south and residential development to the east. Union Pacific Railroad (UPRR) tracks and the Natomas East Main Drainage Canal are located beyond Western Avenue to the west of the site. We did not observe structural improvements at the time of our site reconnaissance. The current site configuration and conditions (based on 2012 satellite imagery) are shown on the Site Plan, Figure 2.

Site topography is relatively flat with an average elevation of approximately 30 to 35 feet above mean sea level. The relative topographic high portions of the site are generally located in the north and south with a topographic low near the center of the site coincident with a shallow drainage swale that generally traverses the site from the northeast to the southwest (Site Plan, Figure 2). North of the site, Silver Eagle Road transitions to a bridge that crosses Western Avenue, the Natomas East Main Drainage Canal, and the UPRR tracks. The bridge approach embankment borders the northwestern portion of the site and ranges in height up to approximately 25 feet with side slopes inclined at approximately 2H:1V (horizontal to vertical). The site is vegetated with one mature tree on the northwest portion of the site and a small grove of several mature trees on the southeast portion of the site. As shown on Photos 1 and 2 on Figure 3, the majority of the site has recently been disCed/tilled presumably for grass/weed control. We observed miscellaneous debris and refuse such as brick, concrete, glass, plaster and tile fragments within the disced/tilled soil throughout the site. Based on our review of historic aerial photographs (1964 and 1971), the northwestern portion of the site formerly contained a commercial building within a fenced area. The approximate locations of the former fenced area and commercial building are shown on the Site Plan, Figure 2).

We understand that proposed development may include single-family residential houses and associated infrastructure (roadways and utilities). The houses will likely consist of one- and two-story, wood-frame structures supported on conventional shallow foundations with concrete slabs-on-grade. Based on site topography, we anticipate that site grading will likely consist of cuts and fills on the order of 3 feet or less. Underground utilities will likely require excavations on the order of 3 to 10 feet.

## ANTICIPATED SUBSURFACE CONDITIONS

The following geologic and soil conditions are based on our review of the referenced geologic literature and our experience in the area. A geologic map of the site and near vicinity is presented as Figure 4. A soil map based on the United States Department of Agriculture (USDA) *Web Soil Survey* is presented as Figure 5.

To aid in evaluating subsurface conditions at the site, we performed four hand-auger borings (B1 through B4) to approximate depths ranging from approximately 2 to 4 feet at the approximate locations shown on the Site Plan, Figure 2. Borings logs are presented as Figures 6 through 10.

### Regional and Site Geology

The site is located within the Great Valley Geomorphic Province of California, more commonly referred to as the Sacramento Valley. The Sacramento Valley is a broad lowland bounded by the Sierra Nevada mountain range to the east and the Coast Ranges to the west. The Sacramento Valley has been filled with a thick sequence of alluvial sediments derived from weathering of the adjacent mountain ranges resulting in a stratigraphic section of Cretaceous, Tertiary and Quaternary deposits.

Based on the *Preliminary Geologic Map of the Sacramento 30' x 60' Quadrangle, California,* California Geological Survey (CGS), 2011, the site is underlain by mid-Pleistocene Riverbank Formation and Holocene Basin Deposits, both of which are alluvial soil deposits. As a result of repeated flood events and sedimentation, the alluvial material in this region is generally consolidated with weakly to moderately cemented materials ("hardpan") below the surficial weathered clay soil. A geologic map of the site and near vicinity is presented as Figure 4.

### Soil Conditions

Based on the USDA Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm), the site is underlain by the following soil units:

- *San Joaquin fine sandy loam* (Unit 211) – A moderately well-drained fine sandy loam to loam that forms on terraces from alluvium derived from granite.
- *Jacktone Clay* (Unit 161) – A somewhat poorly drained loam to clay loam that forms on basin floors from alluvium.
- *San Joaquin-Urban land complex* (Unit 220) – A moderately well-drained fine sandy loam to loam that forms on terraces from alluvium derived from granite.

The approximate lateral extents of these soil units are shown on the Soil Map, Figure 5. As shown on Figure 5, the *San Joaquin fine sandy loam* soil unit covers the majority of the site with the remainder consisting of *Jacktone Clay* soil and *San Joaquin-Urban land complex*.

Based on conditions encountered in our hand-auger borings, near-surface soil generally consists of interbedded layers of lean clay/sandy lean clay (CL) and sandy silt (ML). The top 12 to 24 inches of soil encountered in our borings was loose and disturbed by past discing/tilling operations, likely for grass/weed control. We encountered cemented soil (hardpan) in our borings at depths of approximately 2 to 3 feet.

### Groundwater

We checked the California Department of Water Resources (DWR) water data library (http://www.water.ca.gov/waterdatalibrary/) for groundwater level information for wells near the Site. DWR records are available for one well (09N05E18R001M) approximately 300 feet-northeast of the Site. Depth to groundwater in this well was reported to be 57 feet in 1992.

We also researched the Sacramento Groundwater Authority (SGA) website (http://www.sgah2o.org/sga/) for regional groundwater information. According to the 2011-2012 *Basin Management Report* prepared by the SGA and dated October 21, 2013, depth to groundwater beneath site is approximately 40 feet and groundwater flow was to the east in early 2012.

## GEOLOGIC HAZARDS

Based on our reconnaissance, review of geologic maps and reports, and our experience in the area, we present the following information regarding potential geologic hazards.

### Faulting and Seismicity

The site is not located on any known "active" earthquake fault trace. In addition, the site is not contained within an Alquist-Priolo Earthquake Fault Zone. Therefore, fault rupture is not considered a hazard for the site.

Based on our review of local and regional geologic maps, the Foothills Fault System is located approximately 20 miles north east of the site, the Great Valley Fault System (located on the west side of the Sacramento Valley) is located approximately 29 miles west of the site, and the Mohawk-Honey Lake Fault Zone is located approximately 76 miles to the northeast.

For preliminary seismic design purposes, the site may be considered Site Class "D" in accordance with Section 1613.3.2 of the 2013 California Building Code (CBC). In accordance with the 2013 CBC, the calculated Peak Ground Acceleration modified for Site Class ($PGA_M$) is approximately 0.30g for the site.

### Liquefaction

Liquefaction is a phenomenon in which saturated cohesionless soils are subject to a temporary loss of shear strength due to pore pressure buildup under the cyclic shear stresses associated with earthquakes. Primary factors that trigger liquefaction are: moderate to strong ground shaking (seismic source), relatively clean, loose granular soils (primarily poorly graded sands and silty sands), and saturated soil conditions (shallow groundwater). Due to the depth to groundwater being greater than 40 feet in nearby wells and the presence of cemented, near-surface soil, liquefaction is not considered a hazard for the site.

## Landslides and Slope Stability

The site is relatively flat and level. The Silver Eagle Road bridge approach embankment borders the northwestern portion of the site. We did not observe localized slumping, deep-seated slope failures, debris slides/flows, or other conditions indicative of instability within this embankment. Due to the lack of observed instability, we do not anticipate that slope stability will be a hazard to the proposed development.

## Expansive Soil

We performed laboratory Expansion Index (EI) testing on one composite, near-surface, clayey soil sample to evaluate soil expansion potential. Test results indicate an EI of 46. Table 1 presents soil expansion classifications based on the EI for American Society for Testing and Materials (ASTM) and 2013 CBC standards.

**TABLE 1**
**SOIL EXPANSION CLASSIFICATION BASED ON EXPANSION INDEX**

| Expansion Index (EI) | Soil Expansion Classification (ASTM D4829) | Soil Expansion Classification (2013 CBC) |
|---|---|---|
| 0 – 20 | Very Low | Non-Expansive |
| 21 – 50 | Low | Expansive |
| 51 – 90 | Medium | |
| 91 – 130 | High | |
| Greater Than 130 | Very High | |

As shown on Table 1, the soil sample is considered to have a "low" expansion potential per the ASTM classification. However, the soil is considered "expansive" according to the 2013 CBC, Section 1803.5.3, which generally classifies soil as either "non-expansive" or "expansive." In addition to EI testing, we performed Atterberg Limits testing on one soil sample to further evaluate plasticity and expansion potential. The testing resulted in a Plasticity Index (PI) of 31 which indicates moderate plasticity and expansion potential. Based on the EI and PI test results, site soils are considered moderately expansive.

## Soil Corrosion Screening

We performed laboratory corrosion potential tests on one composite, near-surface, clayey soil sample to evaluate soil corrosion potential; test results are summarized in Table 2.

**TABLE 2**
**SUMMARY OF CORROSION PARAMETERS**
**CALIFORNIA TESTS 643, 417 AND 422**

| Sample No. | Sample Depth (ft.) | pH | Minimum Resistivity (ohm-cm) | Chloride (ppm) | Sulfate (ppm) |
|---|---|---|---|---|---|
| B1/B2/B6 | 0 – 2 | 7.17 | 1,770 | 11.5 | 0.4 |

Caltrans considers a site corrosive to foundation elements if one or more of the following conditions exist for the representative soil samples at the site:

- The pH is equal to or less than 5.5.

- The resistivity is equal to or less than 1,000 ohm-cm.
- Chloride concentration is equal to or greater than 500 parts per million (ppm).
- Sulfate concentration is equal to or greater than 2,000 ppm.

According to the 2013 California Building Code Section 1904.1 which refers to the durability requirements of American Concrete Institute (ACI) 318 (Chapter 4), Type II cement may be used where soluble sulfate levels in soil are below 2,000 ppm.

## CONCLUSIONS AND RECOMMENDATIONS

In our opinion, no adverse geologic or geotechnical conditions are present that would preclude development at the site as presently proposed. Below, we present our findings, preliminary conclusions and recommendations with respect to geotechnical conditions to assist in forward planning and cost estimating.

### Design-level Geotechnical Investigation

Additional site-specific subsurface exploration, laboratory testing, and engineering analysis will be necessary to provide geotechnical recommendations for design and construction. The investigation should be performed after site configuration/layout has been established. The investigation should include several exploratory borings and test pits throughout the site to evaluate tilled and alluvial soil characteristics/thickness, and excavation characteristics.

### Loose Surficial Soils (Tilled Alluvium)

The upper 12 to 24 inches of soil across the site is loose and highly disturbed by past discing/tilling. It is possible that the majority of the disturbed soils may be re-compacted in place, without removal. However, loose and disturbed soils thicker than 12 inches may require removal and re-compaction to provide uniform support for the planned structures. Specific recommendations will be provided as part of the design-level geotechnical investigation.

### Previous Site Development, Existing Fill/Backfill, Debris

The northwestern portion of the site formerly contained a commercial building that has been demolished and removed. It is possible that underground utilities, backfilled pits, or other buried features may exist within this area. In addition, we observed miscellaneous debris and refuse such as brick, concrete, glass, plaster and tile fragments within the near-surface, disced soil throughout the site. All previous improvements (foundations, buried irrigation piping, wells, septic tanks/leachfields, etc.), if present, will require demolition and complete removal prior to development. Existing fill, backfill, and soils disturbed due to previous demolition operations will require thorough re-compaction to provide uniform support for the planned structures and associated improvements. Specific recommendations will be provided as part of the design-level geotechnical investigation.

### Expansive Soils

We expect that near-surface clay soils at the site are moderately expansive when subjected to moisture variations. If not mitigated, these soils can cause differential movement (either shrink or swell) and significant damage to overlying structures. Mitigation of expansive soils at the site will likely include proper moisture conditioning and compaction control during site grading and designing foundations to resist differential soil movement. Specific recommendations will be provided as part of the final geotechnical investigation.

## Excavation and Grading Characteristics

Based on our experience in the area, grading and excavations at the site may be accomplished with standard effort using conventional heavy-duty grading/excavation equipment. Some excavation difficulty may be encountered in cemented ("hardpan") soil generally below about 2 to 3 feet.

If grading commences during the seasonal wet period (typically winter and spring), surface soils will likely be wet causing compaction/workability difficulties. Earthwork and pad preparation operations in these conditions will be difficult with low productivity. Often, a period of at least one month of warm and dry weather is necessary to allow the site to dry sufficiently so that heavy grading equipment can operate effectively and required compaction can be achieved. Conversely, during the seasonal dry period (typically summer and fall), dry clay soils will require additional grading effort (discing or other means) to attain proper moisture conditioning.

## Foundations

Based on the moderately expansive soil conditions at the site and our experience with residential developments with similar soil conditions, suitable building foundation types will likely include (1) conventional shallow foundations with deepened continuous perimeter footings and interior concrete slabs-on-grade or (2) post-tensioned slab foundations. If conventional slab-on-grade foundations are used, the upper portion (typically top 12 inches) of building pads should be composed of low-expansive fill to reduce the potential post-construction interior slab-on-grade distress due to expansive soils. Allowable soil bearing capacity on the order of 2,500 pounds per square foot (psf) may be used for preliminary foundation sizing. Specific recommendations will be evaluated further during the final geotechnical investigation.

## Underground Utilities

We anticipate that conventional, open-cut underground utility installation procedures are feasible for the site.

## Concrete Sidewalks, Driveways, and Flatwork

Based on the moderately expansive soil conditions at the site and our experience with residential developments with similar soil conditions, special procedures may be required to stabilize expansive soil beneath proposed surface improvements such as sidewalks, driveways, and concrete flatwork. These procedures may include pre-saturation of the subgrade, lime treatment, extra reinforcement and control joints in concrete and/or placement of a layer of low-expansive fill below surface improvements.

## Pavement

We anticipate that site soils will exhibit relatively low pavement support characteristics. The typical pavement section for residential streets in the area is approximately 3½ inches of hot mix asphalt (HMA) over 12 inches of aggregate base (AB).

# CLOSURE

Our professional services were performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices used in this area at this time. We make no warranty, either express or implied.

Please contact us if you have any questions regarding this letter or if we may be of further service.

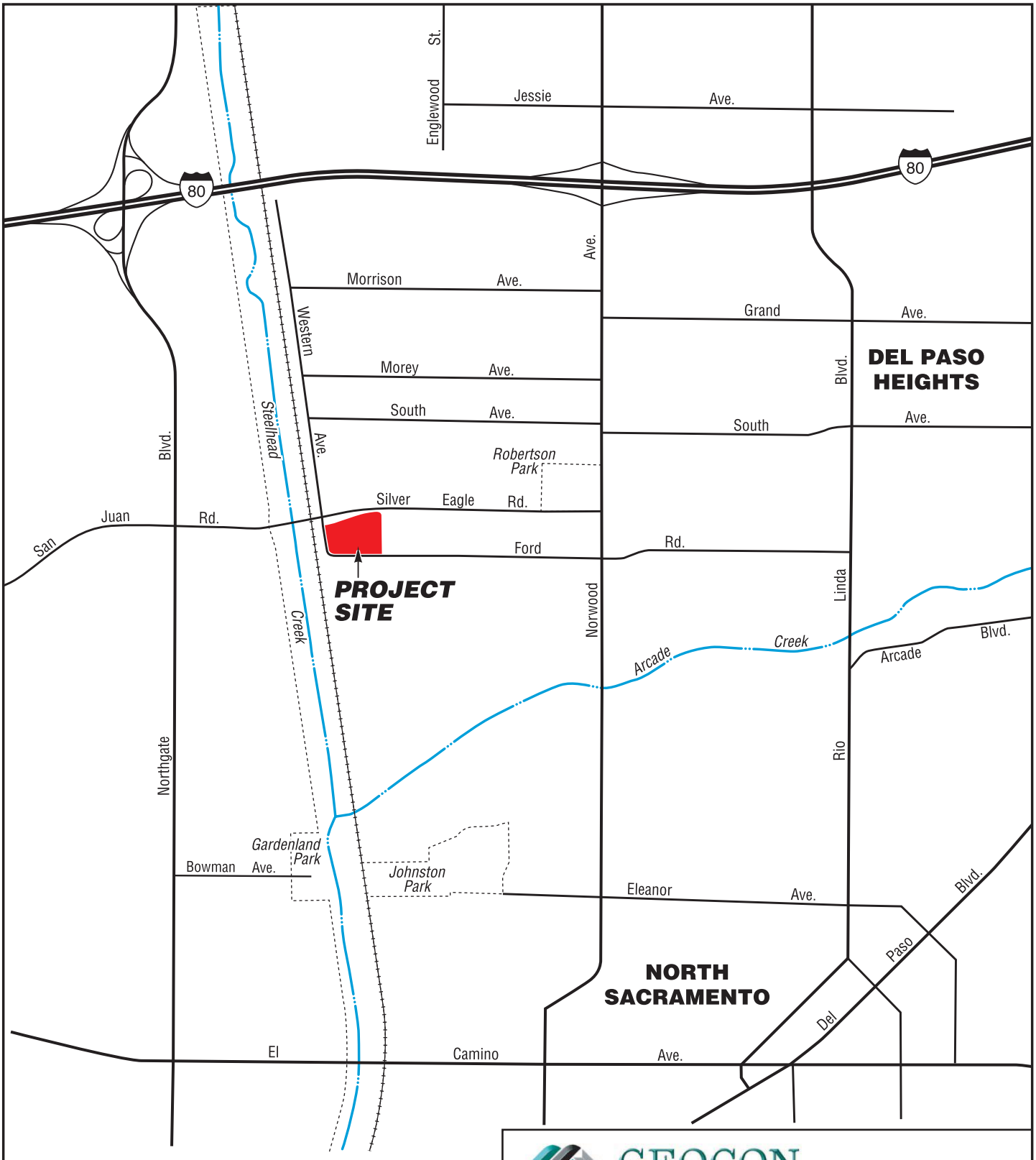
Sincerely,

GEOCON CONSULTANTS, INC.


Jeremy J. Zorne, PE, GE
Senior Engineer

Joshua J. Lewis, EIT
Senior Staff Engineer

Attachments: Figure 1, Vicinity Map
Figure 2, Site Plan
Figure 3, Photos 1 and 2
Figure 4, Geologic Map
Figure 5, Soil Map
Figures 6 through 10, Boring Logs




GEOCON CONSULTANTS, INC.
3160 GOLD VALLEY DR – SUITE 800 – RANCHO CORDOVA, CA 95742
PHONE 916.852.9118 – FAX 916.852.9132

Silver Eagle Property

Sacramento, California

**VICINITY MAP**

| S9843-05-01 | December 2013 | Figure 1 |
|---|---|---|


Vacant Land
Single-Family Residence
Vacant Land
SILVER EAGLE ROAD
Former Building
Former Fence
B1
Drainage Swale
B2
WESTERN AVENUE
UNION PACIFIC RAILROAD
Natomas East Main Drainage Canal
B3
B4
FORD ROAD

Photo No. 1 View of Site Looking West

Photo No. 2 View of Site Looking East

**PHOTOS NO. 1 & 2**

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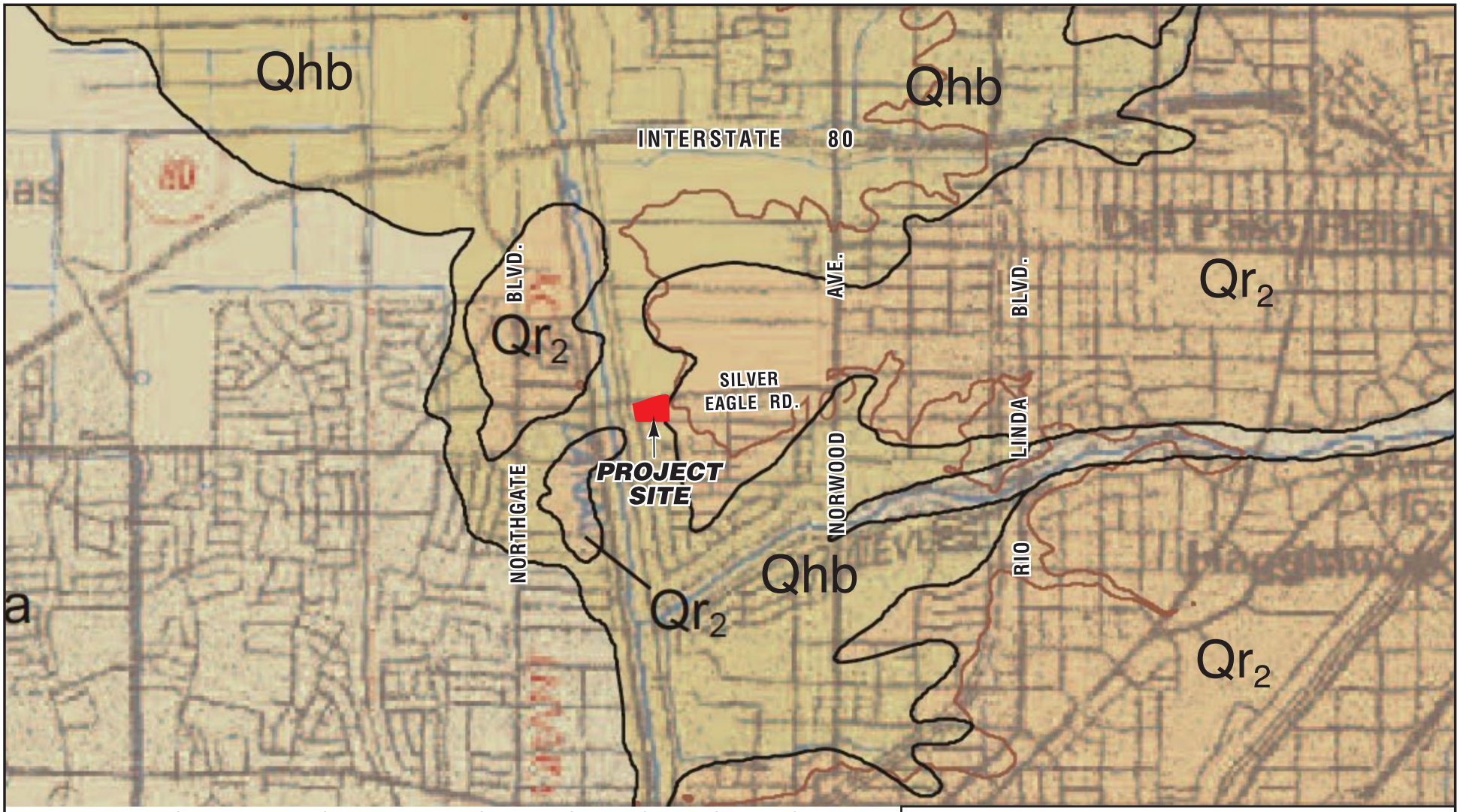
| Silver Eagle Property | | |
|---|---|---|
| Sacramento, California | | |
| S9843-05-01 | December 2013 | Figure 3 |




Map Ref: *Preliminary Geologic Map of the Sacramento 30' x 60' Quadrangle, California*, California Geological Survey, 2011

| | |
|---|---|
| Qhb | Holocene Basin Deposits |
| $Qr_2$ | Later Quaternary Pleistocene Riverbank Formation (Middle Unit) |

N

0 3000

Scale in Feet

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PHONE 916.852.9118 – FAX 916.852.9132

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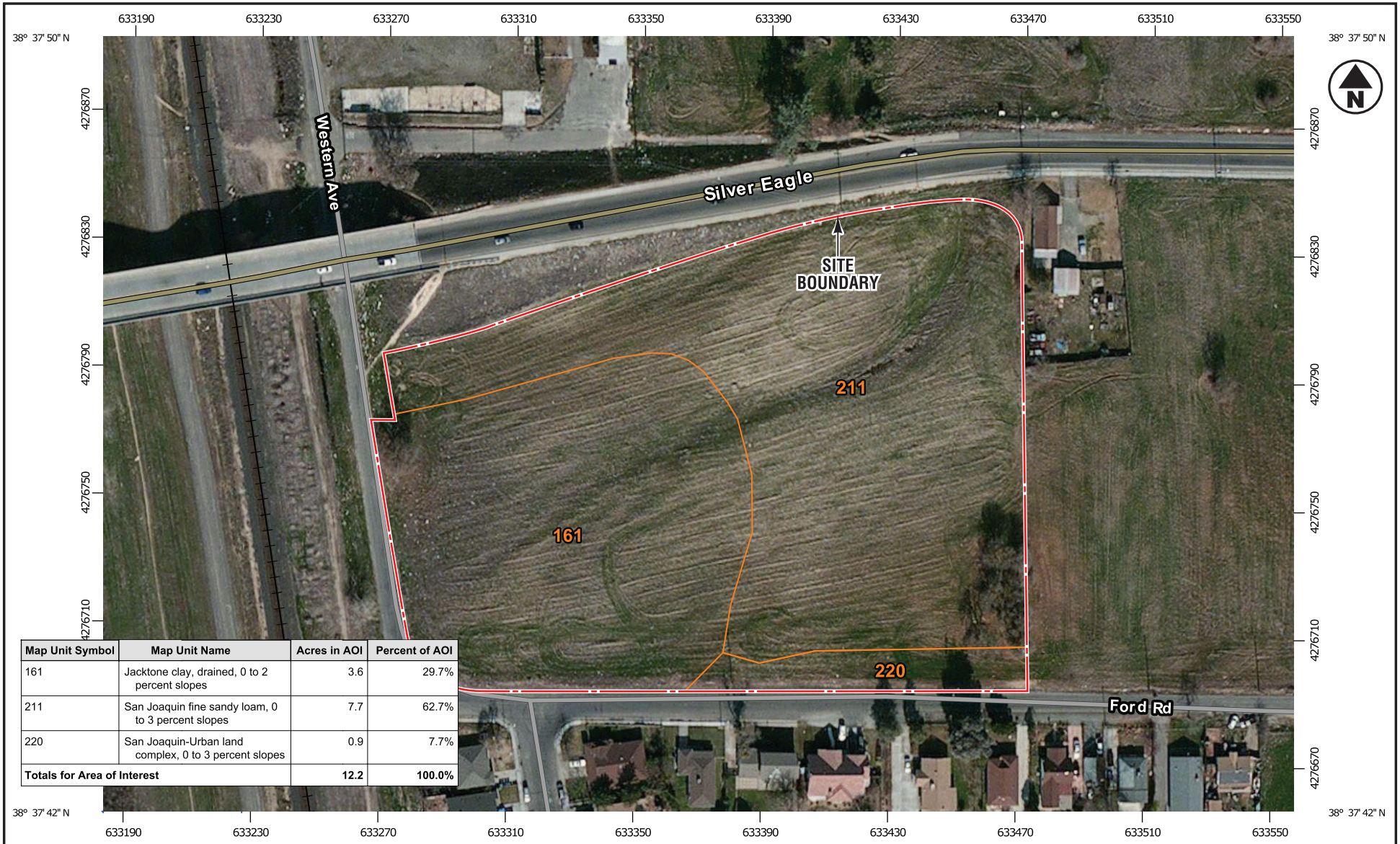
**GEOLOGIC MAP**

| | | |
|---|---|---|
| S9843-05-01 | December 2013 | Figure 4 |




| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| 161 | Jacktone clay, drained, 0 to 2 percent slopes | 3.6 | 29.7% |
| 211 | San Joaquin fine sandy loam, 0 to 3 percent slopes | 7.7 | 62.7% |
| 220 | San Joaquin-Urban land complex, 0 to 3 percent slopes | 0.9 | 7.7% |
| **Totals for Area of Interest** | | **12.2** | **100.0%** |

0 200

Scale in Feet

Ref: *Web Soil Survey National Cooperative Soil Survey*, USDA Natural Resources Conservation Service, 11/13/13

GEOCON CONSULTANTS, INC.
3160 GOLD VALLEY DR – SUITE 800 – RANCHO CORDOVA, CA 95742
PHONE 916.852.9118 – FAX 916.852.9132

**SOIL MAP**

Silver Eagle Property
Sacramento, California

| S9843-05-01 | December 2013 | Figure 5 |
|---|---|---|

# UNIFIED SOIL CLASSIFICATION SYSTEM

| MAJOR DIVISIONS | | | SYMBOL | | TYPICAL NAMES |
|---|---|---|---|---|---|
| COARSE-GRAINED SOILS (MORE THAN HALF IS COARSER THAN NO. 200 SIEVE) | GRAVELS (MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE) | CLEAN GRAVELS WITH LITTLE OR NO FINES | GW |  | WELL GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES |
| | | | GP |  | POORLY GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES |
| | | GRAVELS WITH OVER 12% FINES | GM |  | SILTY GRAVELS, SILTY GRAVELS WITH SAND |
| | | | GC |  | CLAYEY GRAVELS, CLAYEY GRAVELS WITH SAND |
| | SANDS (MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE) | CLEAN SANDS WITH LITTLE OR NO FINES | SW |  | WELL GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES |
| | | | SP |  | POORLY GRADED SANDS WITH OR WITHOUT GRAVELS, LITTLE OR NO FINES |
| | | SANDS WITH OVER 12% FINES | SM |  | SILTY SANDS WITH OR WITHOUT GRAVEL |
| | | | SC |  | CLAYEY SANDS WITH OR WITHOUT GRAVEL |
| FINE-GRAINED SOILS (MORE THAN HALF IS FINER THAN NO. 200 SIEVE) | SILTS AND CLAYS (LIQUID LIMIT 50% OR LESS) | | ML |  | INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTS WITH SANDS AND GRAVELS |
| | | | CL |  | INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, CLAYS WITH SANDS AND GRAVELS, LEAN CLAYS |
| | | | OL |  | ORGANIC SILTS OR CLAYS OF LOW PLASTICITY |
| | SILTS AND CLAYS (LIQUID LIMIT GREATER THAN 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 OR CLAYS OF MEDIUM TO HIGH PLASTICITY |
| HIGHLY ORGANIC SOILS | | | PT |  | PEAT AND OTHER HIGHLY ORGANIC SOILS |

# BORING/TRENCH LOG LEGEND

| | | |
|---|---|---|
| pp | — | Pocket Penetrometer (tsf) |
| tsf | — | Tons Per Square Foot |
| LL | — | Liquid Limit |
| PI | — | Plasticity Index |
| | — | Shelby Tube Sample |
| | — | Bulk Sample |
| | — | SPT Sample |
| | — | Modified California Sample |
| | — | Groundwater Level (At Completion) |
| | — | Groundwater Level (First Encountered) |

## PENETRATION RESISTANCE

| SAND AND GRAVEL | | | SILT AND CLAY | | | |
|---|---|---|---|---|---|---|
| RELATIVE DENSITY | BLOWS PER FOOT (SPT)* | BLOWS PER FOOT (MOD-CAL)* | CONSISTENCY | BLOWS PER FOOT (SPT)* | BLOWS PER FOOT (MOD-CAL)* | COMPRESSIVE STRENGTH (tsf) |
| VERY LOOSE | 0 - 4 | 0 - 7 | VERY SOFT | 0 - 2 | 0 - 2 | 0 - 0.25 |
| LOOSE | 4-10 | 7 - 17 | SOFT | 2 - 3 | 2 - 4 | 0.25 - 0.50 |
| MEDIUM DENSE | 10-30 | 17 - 48 | MEDIUM STIFF | 3 - 8 | 4 - 10 | 0.50 - 1.0 |
| DENSE | 30-50 | 48 - 85 | STIFF | 8 - 15 | 10 - 20 | 1.0 - 2.0 |
| VERY DENSE | OVER 50 | OVER 85 | VERY STIFF | 15 - 30 | 20 - 48 | 2.0 - 4.0 |
| | | | HARD | OVER 30 | OVER 48 | OVER 4.0 |

*NUMBER OF BLOWS OF 140 LB HAMMER FALLING 30 INCHES TO DRIVE LAST 12 INCHES OF AN 18-INCH DRIVE

Geocon Consultants, Inc.
3160 Gold Valley Drive, Suite 800
Rancho Cordova, CA 95742
Telephone: 916-852-9118
Fax: 916-852-9132

## Key to Logs

Project: Silver Eagle 6
Location: Sacramento, CA
Number: S9843-05-01
Figure: 6

PROJECT NO. **S9843-05-01** PROJECT NAME **Silver Eagle 6**

## BORING B1

ELEV. (MSL.) **N/A** DATE COMPLETED **11/4/2013**

ENG./GEO. **JOSHUA LEWIS** DRILLER **GEOCON**

EQUIPMENT **HAND-AUGER** HAMMER TYPE **N/A**

| DEPTH IN FEET | SAMPLE NO. | LITHOLOGY | GROUNDWATER | SOIL CLASS (USCS) | MATERIAL DESCRIPTION | PENETRATION RESISTANCE (BLOWS/FT.) | DRY DENSITY (P.C.F.) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|
| 0 | B1-BULK | | | CL-ML | **ALLUVIUM**<br>Very soft, dry, light tan, Sandy Silty CLAY with coarse to fine Gravel, trace weeds<br>- loose and disturbed (tilled) to approximately 24 inches | | | |
| 1 | | | | | | | | |
| 2 | B1-2.0 | | | ML | Medium stiff, dry to damp, reddish brown, Sandy SILT | | | |
| 3 | B1-3.0 | | | CL | Stiff, dry to damp, reddish brown, Lean CLAY, moderately cemented (hard pan)<br>- refusal | | | |
| | | | | | REFUSAL AT 3.5 FEET<br>GROUNDWATER NOT ENCOUNTERED<br>BACKFILLED WITH SOIL CUTTINGS | | | |

Figure 7, Log of Boring, page 1 of 1

IN PROGRESS NO A S98430501 SILVER EAGLE 6.GPJ 12/04/13

GEOCON

SAMPLE SYMBOLS

☐ ... SAMPLING UNSUCCESSFUL ◧ ... STANDARD PENETRATION TEST ■ ... DRIVE SAMPLE (UNDISTURBED)

⊠ ... DISTURBED OR BAG SAMPLE ◪ ... CHUNK SAMPLE ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. **S9843-05-01** PROJECT NAME **Silver Eagle 6**

## BORING B2

ELEV. (MSL.) **N/A** DATE COMPLETED **11/4/2013**

ENG./GEO. **JOSHUA LEWIS** DRILLER **GEOCON**

EQUIPMENT **HAND-AUGER** HAMMER TYPE **N/A**

| DEPTH IN FEET | SAMPLE NO. | LITHOLOGY | GROUNDWATER | SOIL CLASS (USCS) | MATERIAL DESCRIPTION | PENETRATION RESISTANCE (BLOWS/FT.) | DRY DENSITY (P.C.F.) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|
| 0 | B2-BULK | | | CL-ML | **ALLUVIUM**<br>Medium stiff, dry, grayish brown, Sandy Silty CLAY with coarse to fine Gravel, trace weeds<br>- loose and disturbed (tilled) to approximately 12 inches | | | |
| | | | | | Medium stiff, dry, tan, Silty CLAY with Sand, trace concrete and brick pieces | | | |
| 1 | B2-1.0 | | | CL | Stiff, damp, brown, Lean CLAY | | | |
| | | | | | - refusal on very stiff, dry, light tan, lean clay layer (hardpan) | | | |
| 2 | | | | | BORING TERMINATED AT 2.0 FEET<br>GROUNDWATER NOT ENCOUNTERED<br>BACKFILLED WITH SOIL CUTTINGS | | | |

Figure 8, Log of Boring, page 1 of 1

IN PROGRESS NO A S98430501 SILVER EAGLE 6.GPJ 12/04/13

GEOCON

SAMPLE SYMBOLS

☐ ... SAMPLING UNSUCCESSFUL ◧ ... STANDARD PENETRATION TEST ■ ... DRIVE SAMPLE (UNDISTURBED)

▨ ... DISTURBED OR BAG SAMPLE ◪ ... CHUNK SAMPLE ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. **S9843-05-01** PROJECT NAME **Silver Eagle 6**

## BORING B3

ELEV. (MSL.) **N/A** DATE COMPLETED **11/4/2013**

ENG./GEO. **JOSHUA LEWIS** DRILLER **GEOCON**

EQUIPMENT **HAND-AUGER** HAMMER TYPE **N/A**

| DEPTH IN FEET | SAMPLE NO. | LITHOLOGY | GROUNDWATER | SOIL CLASS (USCS) | MATERIAL DESCRIPTION | PENETRATION RESISTANCE (BLOWS/FT.) | DRY DENSITY (P.C.F.) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|
| 0 | B3-BULK | | | CL-ML | **ALLUVIUM**<br>Soft, dry, light brown, Sandy Silty CLAY with coarse to fine Gravel, trace weeds<br>- loose and disturbed (tilled) to approximately 18 inches | | | |
| 1 | | | | | | | | |
| | B3-1.5 | | | CL-ML | Medium stiff, damp, reddish brown, Silty CLAY | | | |
| 2 | B3-2.0 | | | CL | Stiff, moist, reddish brown, Lean CLAY | | | |
| 3 | | | | | | | | |
| | B3-3.5 | | | CL | Hard, dry, light tan, Lean CLAY, moderately cemented (hard pan) | | | |
| 4 | | | | | BORING TERMINATED AT 4.0 FEET<br>GROUNDWATER NOT ENCOUNTERED<br>BACKFILLED WITH SOIL CUTTINGS | | | |

Figure 9, Log of Boring, page 1 of 1

IN PROGRESS NO A S98430501 SILVER EAGLE 6.GPJ 12/04/13

GEOCON

SAMPLE SYMBOLS

☐ ... SAMPLING UNSUCCESSFUL ◧ ... STANDARD PENETRATION TEST ■ ... DRIVE SAMPLE (UNDISTURBED)

▨ ... DISTURBED OR BAG SAMPLE ◥ ... CHUNK SAMPLE ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.

PROJECT NO. **S9843-05-01** PROJECT NAME **Silver Eagle 6**

## BORING B4

ELEV. (MSL.) **N/A** DATE COMPLETED **11/4/2013**

ENG./GEO. **JOSHUA LEWIS** DRILLER **GEOCON**

EQUIPMENT **HAND-AUGER** HAMMER TYPE **N/A**

| DEPTH IN FEET | SAMPLE NO. | LITHOLOGY | GROUNDWATER | SOIL CLASS (USCS) | MATERIAL DESCRIPTION | PENETRATION RESISTANCE (BLOWS/FT.) | DRY DENSITY (P.C.F.) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|
| 0 | B4-BULK | | | CL-ML | **ALLUVIUM**<br>Soft, dry, light reddish brown, Sandy Silty CLAY with coarse to fine Gravel, trace weeds<br>- loose and disturbed (tilled) to approximately 18 inches | | | |
| 1 | | | | | | | | |
| | B4-1.5 | | | ML | Medium stiff, dry, reddish brown, Sandy SILT | | | |
| 2 | | | | | | | | |
| | B4-2.5 | | | CL-ML | Stiff, dry, brown, Silty CLAY<br>- hard, cemented (hard pan) | | | |
| 3 | | | | | BORING TERMINATED AT 3.0 FEET<br>GROUNDWATER NOT ENCOUNTERED<br>BACKFILLED WITH SOIL CUTTINGS | | | |

Figure 10, Log of Boring, page 1 of 1

IN PROGRESS NO A S98430501 SILVER EAGLE 6.GPJ 12/04/13

GEOCON

SAMPLE SYMBOLS

☐ ... SAMPLING UNSUCCESSFUL ◧ ... STANDARD PENETRATION TEST ■ ... DRIVE SAMPLE (UNDISTURBED)

⊠ ... DISTURBED OR BAG SAMPLE ◪ ... CHUNK SAMPLE ▼ ... WATER TABLE OR SEEPAGE

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING OR TRENCH LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND TIMES.