PRELIMINARY GEOLOGIC HAZARDS REPORT for THE VILLAGE AT SOUTHHILL Nevada County, California

Prepared for:
PMC
140 Independence Circle, Suite C
Chico, California 95973

Prepared by:
Holdrege & Kull
792 Searls Avenue
Nevada City, California 95959

Project No. 3594-01
October 10, 2008

HOLDREGE & KULL
CONSULTING ENGINEERS • GEOLOGISTS

Project No. 3594-01
October 10, 2008

PMC
140 Independence Circle, Suite C
Chico, CA 95973

Attention: Mike Martin, Senior Planner

Reference: ***The Village at SouthHill***
Nevada County, California

Subject: ***Preliminary Geologic Hazards Report***

Dear Mr. Martin:

This report presents the results of Holdrege & Kull's (H&K's) preliminary geologic hazards investigation for the 65-acre Village at SouthHill Master Plan area and the 75-acre Annexation Area, which are collectively referred to as the project. This report was prepared to facilitate planning and development by providing a description of geologic and geotechnical conditions at the site.

The proposed Village at SouthHill is located east of State Route 49 and west of La Barr Meadows Road, approximately one tenth of a mile south of the City of Grass Valley, in Nevada County, California. As proposed, the Village at SouthHill development includes commercial and residential development, as well as open space. The Annexation Area comprises 33 parcels located east of State Route 49, between the Village at SouthHill and the Grass Valley city limits. The Annexation Area is designated as commercial and business park per the City's 2020 General Plan.

The findings presented in this geologic hazards report are based on H&K's observation of surface and subsurface conditions, review of previous reports, and review of published maps and literature. The estimate of preliminary seismic design criteria was based on observation of soil conditions revealed in previous exploratory trenches, and should be confirmed by a design-level geotechnical engineering investigation. H&K's opinion is that the project can be completed as proposed, provided the potential geological hazards at the site are addressed in the project design per the findings of a design-level geotechnical engineering report.

From a geotechnical engineering standpoint, H&K's primary concerns are localized poor site drainage and expansive soil, the presence of several loose fill areas, shallow underground mine workings, and the stability of existing earth dams. Potential chemical hazards associated with rock and soil fill that has been determined to originate from adjacent, historic, hard rock mining operations are to be addressed prior to site development in accordance with cleanup recommendations that have been approved by the California EPA.

We appreciate the opportunity to provide geotechnical engineering services for the Village at SouthHill. Please contact the undersigned if you have any questions regarding our observations or the recommendations presented in this report.

Sincerely,

HOLDREGE & KULL

REGISTERED PROFESSIONAL ENGINEER
JASON W. MUIR
No. 2697
Exp. 06/10
GEOTECHNICAL
STATE OF CALIFORNIA

Jason W. Muir, G.E. 2697
Principal Engineer

copies: 3 to PMC / Attn: Mike Martin

F:\1 Projects\3594 Village at SouthHill\Report - Prelim Geohazards\01 Report\3594-01 Geohazards Report.doc

TABLE OF CONTENTS

1 INTRODUCTION

At the request of Mike Martin, Project Manager for PMC, Holdrege & Kull (H&K) performed a geologic hazards investigation for the Village at SouthHill Master Plan and Annexation Area, which are collectively referred to as the project. The investigation was performed in general accordance with H&K's October 19, 2007 proposal for the project. The geologic hazards investigation focused on the proposed Village at SouthHill development area; therefore, this report does not contain specific findings pertaining to development of the Annexation Area.

1.1 PROJECT LOCATION AND DESCRIPTION

The proposed 65-acre Village at SouthHill is located east of State Route 49 and west of La Barr Meadows Road, approximately one tenth of a mile south of the City of Grass Valley, in Nevada County, California. A site location map is presented as Figure 1. Per the Village at SouthHill Master Plan (SCO Planning & Engineering, Inc., 2007), elevations on the Village at SouthHill property range from approximately 2,340 feet to 2,420 feet above sea level. The property generally slopes to the west from La Barr Meadows Road towards State Route 49. The site retains features from past industrial operations such as the Bear River lumber mill, Valley Veneer Plant, and Bullion gold mine. The Village at SouthHill comprises seven parcels, which are designated as Nevada County Assessor's Parcel Numbers (APNs) 22-160-04, 22-160-06, 22-250-12, 22-282-01, 22-282-02, 22-282-03, and 22-282-04.

The 75-acre Annexation Area comprises 33 parcels located east of State Route 49, between the Village at SouthHill and the southern boundary of the City of Grass Valley. Some of the Annexation Area parcels currently support commercial and residential development. The Annexation Area APNs are: 22-140-05, 22-140-08, 22-140-10, 22-140-11, 22-140-12, 22-140-21, 22-140-22, 22-140-25, 22-140-36, 22-140-37, 22-140-38, 22-140-41, 22-140-43, 22-140-47, 22-140-48, 22-150-03, 22-150-04, 22-150-08, 22-150-09, 22-150-10, 22-150-11, 22-150-15, 22-150-16, 22-150-17, 22-150-18, 22-150-21, 22-150-22, 22-150-23, 22-150-28, 22-150-30, 22-150-32, 22-150-33, and 29-290-09.

Land to the west of the project, across State Route 49, is occupied by rural residential properties ranging from 5 acres to ½ acre in size. Wolf Creek is located approximately 2,200 feet west of State Route 49 and approximately 200 feet lower in elevation than the lowest area of the project site. Rural residential and vacant land are located beyond La Barr Meadows Road to the east of the project site.

There are existing light industrial and rural residential land uses to the north as well as rural residential uses to the south of the project site.

1.2 PREVIOUS SITE USE

Hard rock gold mining was performed in the vicinity of the Village at SouthHill site from the mid 1800s to the early 1900s. Workings of the Bullion mine (Figure 2) are located near the eastern site boundary. Shallow mine workings (Figure 3) and former processing operations extend east onto the site, and mine waste was deposited on the site as a result of past mining activities. Deeper mine workings generally extend towards the northeast, away from the site.

Lumber milling and wood products production facilities were located on the site from 1956 until 1978 (Jensen, 1999). Former Bear River Sawmill facilities were located centrally within the site, and former Valley Veneer Plant facilities were located in the northeastern portion of the site. Two existing ponds, one abandoned pond, and their associated earth dams are located in the central-western portion of the site. These features are depicted on Sheet 1.

1.3 PROPOSED IMPROVEMENTS

Per the Village at SouthHill Master Plan (SCO, 2007), the proposed Village at SouthHill includes five development areas: Central Business, Commercial Business Park, Single-family Residential, Multi-family Residential and Open Space. Development is to include significant earthwork cut and fill, retaining walls, installation of underground utilities, construction of commercial and residential structures, and paving.

The master plan includes realignment and expansion of a portion of the Crestview Road intersection with State Route 49, which would serve as the project's primary access. La Barr Meadows Road is to be realigned, and three traffic roundabouts and four storm drainage detention basins are proposed near the realigned road.

The site drains to a pond at the central-western portion of the site. The pond discharges in an existing culvert beneath State Route 49 and then flows into Wolf Creek. Per the Master Plan (SCO, 2007) Caltrans requires that the project result in no net increase in storm water runoff through the existing storm drainage system. Therefore, the project design intends to detain all surface storm water on-site via the proposed detention basins.

In order to annex the Village at SouthHill into the City of Grass Valley, the proposed project includes the annexation of 75 acres of land between the SouthHill property and the city limits. This Annexation Area is designated as Commercial and Business Park per the City's 2020 General Plan.

1.4 PURPOSE

The purpose of the geologic hazards evaluation is to identify potential geologic hazards at the proposed Village at SouthHill site, to provide information about seismicity, and to provide preliminary seismic design criteria. This geologic hazards investigation report was prepared to facilitate planning and development by providing a description of geologic and geotechnical conditions at the site.

1.5 SCOPE OF SERVICES

To prepare this report, H&K performed a geologic hazards investigation that included a literature review and review of subsurface data obtained during H&K's previous investigations. H&K also reviewed the findings of previous reports prepared by H&K and others, as referenced herein.

Although the proposed Annexation Area is to be annexed to the City as part of the proposed project, development of the parcels within the Annexation Area will be evaluated by the project Environmental Impact Report (EIR) at a programmatic level rather than at the project level. Therefore, this geologic hazards report does not contain specific findings pertaining to development of the Annexation Area.

H&K's scope of services did not include a design-level geotechnical engineering investigation, groundwater flow analysis, nor testing for hazardous materials.

2 SUMMARY OF PREVIOUS INVESTIGATION

2.1 PREVIOUS GEOTECHNICAL INVESTIGATION

H&K (1999) performed a preliminary geotechnical and geologic hazards investigation for the Bear River Mill Site, which included the subject Village at SouthHill site. The investigation included review of historical mining documents, surface reconnaissance, and excavation of 33 exploratory trenches (Nos. 1 through 33 in Appendix A) to depths ranging from 3 to 13 feet below the ground surface (bgs). Exploratory trench locations are depicted on Sheet 1. Remolded swell testing (Table 1) was performed on selected bulk soil samples to determine their expansion indices. Findings and preliminary geotechnical engineering recommendations are presented in H&K's *Preliminary Geotechnical and Geologic Hazards Report for Bear River Mill Site* (August 20, 1999). H&K issued an amendment to the report (January 31, 2000) which discussed shallow mine workings identified in the northeast portion of the site and provided general recommendations for their physical closure.

H&K (2001) performed a preliminary characterization of abandoned mine features at the Bear River Mill Site. H&K's investigation included review of historic maps and publications pertaining to hard rock mining on and near the site, and observation of subsurface conditions in an additional 16 exploratory trenches (Nos. 34 through 49 in Appendix A) to depths ranging from 10 to 23 feet bgs. Findings and recommendations are presented in H&K's *Preliminary Abandoned Mine Site Characterization for Bear River Mill Site, Nevada County, California* (October 3, 2001).

H&K (2005) performed a preliminary geotechnical engineering investigation for proposed improvement of the intersection of State Route 49 and Crestview Drive. Findings are presented in H&K's *Preliminary Geotechnical Engineering Report for Crestview Drive / State Route 49 Intersection, Nevada County, California* (July 13, 2005).

2.2 PREVIOUS ENVIRONMENTAL INVESTIGATION

Environmental investigation and remediation activities have been performed at the site since 1988. The early site investigations focused on the prior release of wood treating chemicals and diesel fuel. Investigation findings and monitoring results were presented in approximately 26 reports prepared by Emcon Associates, Vector

Engineering, Kennedy/Jenks/Chilton Consultants, Inc., Anderson Consulting Group and Sierra Pacific Industries.

Diesel contamination was not detected in site groundwater after 1999. The California Regional Water Quality Control Board (RWQCB) issued a "No Further Action Required" letter pertaining to the diesel fuel release on October 6, 2004.

Concrete and soil impacted by pentachlorophenol (PCP, a fungicide) were removed from the Green Chain Area of the former Bear River Sawmill and disposed at a landfill in 1989 and 1991. Subsequent verification soil sampling was performed by Carlton Engineering, Inc. (Carlton) under the oversight of the California EPA Department of Toxic Substances Control (DTSC). No PCP or other semi-volatile organic compounds were detected in soil samples obtained from the excavation areas. Wood treating chemicals were not reported to have been used at the Valley Veneer Plant and were not detected in soil or groundwater samples collected from that area.

Jensen & Associates (1999) prepared an archeological inventory survey that identified past lumber milling operations. Construction, operation and subsequent demolition of the facilities included substantial re-countouring of the original topography, installation of subsurface pipelines, and construction of log decks, earth dams and settling ponds. Findings are presented in *Archeological Inventory Survey, Bear River Mill Site Development Project, Approximately 135 acres South of Grass Valley, Nevada County, California* (Jensen & Associates, October 19, 1999).

Kennedy/Jenks Consultants (1999) performed a Phase I Environmental Site Assessment (ESA). Findings are presented in *Phase I Environmental Site Assessment, Former Bear River Sawmill and Valley Veneer Facility, Grass Valley, California* (November 22, 1999).

H&K (2001) performed a preliminary characterization of abandoned mine features at the Bear River Mill Site as described above in the *Previous Geotechnical Investigation* section of this report. H&K's investigation included review of historic maps and publications pertaining to hard rock mining on and near the site, observation of subsurface conditions in 16 exploratory trenches, collection of soil and rock samples, and laboratory analysis for total arsenic, lead and mercury.

H&K (2005) performed an environmental investigation pertaining to the proposed improvement of the intersection of State Route 49 and Crestview Drive. Findings

are presented in *Limited Environmental Site Assessment Report for Crestview Drive / State Route 49 Intersection, Grass Valley, California* (July 19, 2005).

Carlton (2005) characterized abandoned mine features at the site and prepared a Removal Action Work Plan (RAWP). Findings are presented in Carlton's *Final Removal Action Workplan, Bear River Mill Site, Grass Valley, California* (September 23, 2005). The RAWP was approved by DTSC in 2005; however, implementation of the RAWP is contingent upon approval and construction of The Village at SouthHill project.

3 GEOLOGIC HAZARDS INVESTIGATION

H&K's evaluation of geologic hazards was based on review of geologic maps and literature, review of regional aerial photographs, site reconnaissance, and review of the findings of previous investigation.

3.1 AERIAL PHOTOGRAPH REVIEW

H&K reviewed aerial photographs dated 1952, 1962, 1987 and 1998 for the site and vicinity provided by Environmental Data Resources, Inc. Copies of the photographs are presented in Appendix B.

The 1952 aerial photograph post-dates the majority of hard-rock gold mining activity in the site vicinity, but pre-dates the reported development of lumber milling facilities at the site. The photograph is of poor resolution and depicts disturbed soil conditions across the eastern and central portions of the site. Structures/and or foundations are faintly visible in the southeastern portion of the site. Roads are visible along the approximate current alignments of State Route 49 and La Barr Meadows Road. Little evidence of development is apparent on adjacent properties in the immediate site vicinity.

The 1962 photograph more clearly depicts graded portions of the site. Vegetation is present only in isolated areas near the western site boundary. Industrial structures and equipment assumed to be associated with lumber milling operations are visible in the central eastern and southeastern portions of the site. Industrial operations to the north of the site are visible, as are structures to the north of the site near the present day McKnight Way interchange.

The relatively poor-quality 1987 aerial photograph post-dates the reported lumber milling activities, and indicates that additional clearing and grading had been performed since 1962. Land to the east of the site, across La Barr Meadows Road, had been cleared. Industrial operations to the north of the site had been expanded. State Highway 49 and the McKnight Way interchange had been constructed.

The 1998 photograph depicts vegetation in much of the previously cleared portions of the site and offers little evidence of continued industrial activity on the site. The industrial activity depicted to the north of the site, as well as general development near the southern boundary of the City of Grass Valley, increased significantly since 1987.

3.2 LITERATURE REVIEW

H&K reviewed geologic maps and literature pertaining to the project site. A list of references is presented in Section 5 of this report. Findings are summarized below.

3.2.1 Soil Survey

The *Soil Survey of Nevada County Area, California* (soil survey) published by the United States Department of Agriculture Soil Conservation Service and Forest Service (1993) depicts three general soil types at the project site: Musick Sandy Loam, Hoda Sandy Loam, and Alluvial Land. Soil types are depicted on Figure 4.

Musick and Hoda soil types dominate the higher, southern portion of the site. Both soil types are characterized by well drained surface soil underlain by weathered granodiorite rock at depths of 5 to 8 feet bgs. Depth to weathered rock will typically be less in cut areas, as was observed during H&K's previous subsurface investigation. Per the soil survey, areas of resistant rock outcrop typically comprise 10% of the total ground surface in areas of Musick and Hoda soil types. H&K observed rock outcrop areas and shallow, resistant rock in the southern and central-western portions of the site.

The soil survey depicts Alluvial Land in the central and eastern portions of the site. Alluvial Land is characterized by clayey soil of slow to very slow permeability. Runoff is typically slow and flooding is common during the rainy season. Clayey alluvial deposits are likely to exhibit high shrink/swell characteristics when subjected to moisture variation. H&K typically observed firm clay and medium dense, clayey silt at depths of 3 to 6 feet bgs in the exploratory trenches excavated in the lower, eastern portions of the site. Standing water, saturated surface soil, and evidence of seasonal flooding was common in these areas, as depicted approximately on Sheet 1.

Soil conditions in the central-eastern portion of the site and the northern end of the site have been altered by previous grading and are not specifically classified by the soil survey. The cut/fill area in the northern end of the site is in an area of Musick Sandy Loam, and the cut/fill area in the central western portion of the site would likely have been classified as alluvial land prior to grading.

3.2.2 Geologic Setting

The site is located in the Sierra Nevada Foothills, on the western side of the Sierra Nevada geomorphic province. The Sierra Nevada province is an elongate, north-

west trending structural block that is tilted upward to form a steep scarp above the adjacent Basin and Range province to the east. The western slope of the Sierra Nevada dips gently westward, and extends beneath sediment of the Great Valley province. Continual uplift and erosion of the Sierra Nevada contributes to sediment within the Great Valley.

The western foothills of the Sierra Nevada consist of a complex assemblage of igneous and metamorphic rocks. The regional structure of the foothills is characterized by the north-northwest trending Foothills Fault System, a feature formed during the Mesozoic era (between 65 million and 230 million years before present (MYBP)) in a compressional tectonic environment. A change to an extensional tectonic environment during the Late Cenozoic (last 9 million years) resulted in normal faulting which has occurred coincident with some segments of the older faults near the site.

The California Department of Conservation (1992) indicates that the site is underlain by plutonic rocks. According to Tuminas (1983), the site is underlain by early Cretaceous, La Barr Meadows quartz diorite. The early Cretaceous period encompasses a time frame of approximately 100 to 136 MYBP. Geologic conditions depicted by Johnston (1939) are reproduced in Figure 2.

3.3 SITE INVESTIGATION

H&K performed field reconnaissance and subsurface exploration on August 5 and 6, 1999, and September 12 and 13, 2001. We returned to the site on September 16, 2008 to observe changes in surface conditions since our previous investigations. The ground surface was obscured by dense brush in portions of the site, and access by excavation equipment was limited in some areas due to steep slopes. The site conditions and the soil/rock conditions described below are based on observations made during the surface reconnaissance and exploratory trenching.

3.3.1 General Site Conditions

Dominant vegetation across the site included ponderosa pine, black oak, manzanita, Scotch broom, annual grasses and forbs, and occasional madrone and ceonothus. Vegetation in the lower, western portions of the site included annual grasses and yellow star thistle, as well as a variety of riparian vegetation in marsh areas. Dense brush, including blackberry and Scotch broom, restricted access to the interior of the site east of the ponds, as depicted approximately on Sheet 1.

Dense manzanita (Photo 1) was present in the southern end of the site. Relatively little vegetation was present in the northern and eastern portions of the site.

Much of the central and northern portions of the site had been previously graded. The grading was predominantly associated with historic lumber milling operations; however, soil may have been exported from the central portion of the site for other purposes. Several fill areas were observed near the perimeter of the graded areas. In general, the fill was relatively loose and contained a significant amount of wood waste.

A significant amount of debris was observed in the vicinity of the historic mill operations (Sheet 1). Reinforced concrete slabs-on-grade, concrete foundations, rubble and debris piles were common in the central east and northeast portions of the site. Many stockpiles in this area contained debris and organic material and would not be suitable for use as structural fill.

Rock fill and stockpiles were common in the central portion of the site. Some of the rock originated from nearby historic gold mining activities. Rock and soil originating from hard rock mining activities has the potential to contain elevated metals concentrations, and is to be addressed by remedial action under the oversight of DTSC prior to site development.

H&K observed several areas of saturated surface soil, standing water or riparian vegetation on the site. Evidence of seasonal ponding and poor drainage was common in the central portion of the property. Two ponds were located near the western property boundary. The earth dam for the larger pond had apparently experienced a significant amount of seepage. The dam had been breached at least once, as evidenced by erosion over the top of the dam. A third, dry pond was identified southeast of the existing ponds.

H&K encountered seepage and/or shallow groundwater at depths of 2 to 8 feet bgs in the alluvial areas, which are located predominantly on the eastern side of the site, and in the vicinity of the ponds on the western side of the site. Seepage was commonly observed along the upper surface of the clay and clayey silt typically found at a depth of approximately 5 feet bgs in the alluvial areas. Evidence of seasonal flooding and soil saturation was common. Seepage and standing water was observed at the ground surface in and near saturated areas, as shown on Sheet 1.

H&K did not encounter groundwater or seepage during excavation of exploratory trenches in the higher, western portions of the site. However, isolated areas of

seepage or saturated near-surface soil may be encountered during grading or excavation, particularly during or immediately after the rainy season.

Carlton (2005) reports the results of groundwater investigation at the site near the former Bear River Mill by others during the late 1980s. Groundwater was reported to be first encountered during drilling at depths of 15 to 25 feet bgs. Groundwater generally stabilized in well casings at depths 3 to 10 feet higher than the first encountered depths, suggesting partially confined conditions. The groundwater gradient was reported to be toward the north/northwest, generally following surface topography.

3.3.2 Subsurface Conditions

The soil conditions described in the following paragraphs are generalized, based on a review of subsurface descriptions resulting from H&K's exploratory trenching in 1999 and 2001. Detailed descriptions of subsurface conditions are presented in trench logs 1 through 49 in Appendix A. Trench locations are depicted on Sheet 1.

Stockpiles containing wood debris and other organic material that would be unsuitable for use as structural fill were encountered at locations including exploratory trenches 1, 2, 3, 5 and 9. A typical stockpile is shown in Photo 2. Soil and rock stockpiles that may be suitable, from a geotechnical standpoint, for use as structural fill were encountered at locations such as exploratory trench 8.

Fill containing wood debris and other organic material that would be unsuitable for use as structural fill were encountered at locations including exploratory trenches 13, 14, 15, 16, 17, 22, 24, 42 and 45. Rock and soil fill that may be suitable, from a geotechnical standpoint, for use as structural fill was observed in exploratory trenches 10, 11, 23, 27, 37, 41 and others.

Shallow saturated soil conditions were encountered at locations including exploratory trenches 4 and 7. Shallow resistant rock was encountered in exploratory trench 12. Potentially expansive soil was encountered at locations including trenches 4, 10, 14, 15 and 19.

3.3.3 Past Lumber Milling Operations

Numerous debris stockpiles and several fill areas (Sheet 1) resulted from historic milling operations. The three ponds in the western portion of the site were associated with milling activities.

Concrete slabs-on-grade up to 14 inches thick covered the ground surface across much of the former Bear River Sawmill location (Photos 3 and 4). Reinforcement in the slabs and walls, where exposed, consisted of No. 5 rebar. Steel up to ⅞ inches thick was embedded in the concrete slabs. Several stockpiles of broken concrete and other debris were observed in the vicinity of the mill site. An adjacent concrete foundation exposed in exploratory trench 11 extended from 2 feet to deeper than 8 feet bgs. Shallow fill was common in the area of the mill site. H&K observed layers of gravel, clay, clean sand, and organic debris to depths of approximately 6 feet bgs near the mill site.

Asphalt pavement and several concrete slabs-on-grade covered the ground surface at the former Valley Veneer Plant location (Photos 5 and 6). Slab thickness was at least 12 inches. Fill underlies the west side of the southern concrete slab. Backhoe access to the slope was limited; however, the fill may be more than 10 feet deep based on local topography. Other minor fill areas may be present in the vicinity of the plant.

3.3.4 Existing Fill Areas

H&K encountered several significant fill areas and numerous smaller fills during previous field investigations. The larger fill areas are discussed below.

Exploratory trenches 13 through 15 were excavated into fill which, based on local topography, may encompass an area greater than 200 feet in diameter and may extend further to the east. In general, the fill consisted of medium to dark brown, sandy silt interbedded with abundant peat and wood debris. The fill extended to depths of approximately 7 to 9 feet bgs in exploratory trenches 13 through 15 and was underlain by blue-grey, firm clay. A corrugated metal culvert was encountered at a depth of approximately 8 feet bgs in exploratory trench 13.

Exploratory trenches 16 through 18 were excavated in and near a relatively large fill area near the western site boundary. Based on local topography, the fill extends approximately 250 feet along a west-facing slope and continues approximately 100 feet east of the hinge point of the slope. Near the hinge point of the slope, the fill was more than 13 feet deep. In general, the fill consisted of medium brown to dark brown, sandy silt interbedded with layers of peat and wood debris. Logs up to 16 inches in diameter were encountered during excavation in the fill.

Exploratory trench 21 was excavated in a cut and fill area. The approximately 1:1, horizontal:vertical (H:V) cut slope on the southern side of the area was approximately 10 to 12 feet high. The fill slope on the northern side of the area

was approximately 10 to 15 feet high. Based on local topography, the graded area consisted predominantly of cut native soil. The native soil was derived from residually weathered rock and was described as orange-brown, silty sand.

Exploratory trenches 23, 45 and 46 were excavated in a relatively deep, rock fill area located northwest of the former Bear River Sawmill location. In general, the fill consisted of angular rock to 18 inches in diameter. Three apparently abandoned electrical conduits were observed in the trench at a depth of approximately 2.5 feet bgs. A perforated, corrugated, 18 to 24-inch diameter metal pipe was observed at a depth of approximately 4 feet bgs. The excavation was terminated at a depth of 8 feet bgs due to extensive caving. The rock fill is located in a natural drainage swale that would flow northwest towards the ponds. The open graded rock and perforated metal pipe are likely components of a subsurface drain for the area.

We observed miscellaneous fill and soil stockpiles around the perimeter of the graded areas in the central and northern portions of the site. Exploratory trench 8 was excavated in one of the larger soil stockpiles. Soil revealed in the approximately 8-foot-high stockpile was classified as orange-brown, clayey silt with variable fine sand and minor isolated pockets of wood debris. Selective borrow may be possible from soil stockpiles of this composition, provided that the stockpiles do not contain elevated concentrations of metals or other environmental contaminants.

Numerous debris stockpiles were observed throughout the graded areas in the central and northern portions of the site. Exploratory trenches 1, 2, 3, 5, 9, 28, 29 and 32 were excavated in debris stockpiles that appeared to be representative of other stockpiles in the immediate vicinity. The majority of the debris stockpiles observed contained a significant amount of wood waste and would not be suitable for use as structural fill. A number of shallow rubbish fills were also observed throughout the site. Some of the more notable areas of debris and rubbish observed at the site are noted on Sheet 1.

3.3.5 Existing Earth Dams

A former pond (Pond 1; Photo 7) and two existing ponds were located near the western site boundary. Per the Master Plan (SCO, 2007) the two existing ponds are to be renovated as part of site development. The smaller, southern pond (Pond 2; Photo 8) was approximately 0.1 acre in area and was retained by an earth dam along its northern and eastern shores. The pond was dry at the time of H&K's September 2008 site reconnaissance. The earth dam was approximately 225 feet

long and approximately 12 feet wide at its crest. The down slope height of the dam was approximately 25 to 30 feet. The outlet structure (Photo 9) consisted of a 24-inch diameter, corrugated metal pipe whose outfall was directed towards a defunct water conveyance structure that apparently transported water to the adjacent Pond 3.

The larger, northern pond (Pond 3; Photo 10) was approximately ½ acre in area and was retained by an earth dam along its western boundary. The earth dam was approximately 300 feet long and approximately 10 feet wide at its crest. The down slope height of the dam was approximately 25 to 30 feet. The outlet structure for the larger pond consisted of a 30-inch diameter corrugated metal pipe located near the northern end of the dam. The outlet structure discharged to an eroded, partially rock lined, earth swale that drained to the southwest. The earth dam appeared to have experienced a significant amount of seepage. The dam had been breached at least once, as evidenced by erosion over the top of the dam.

3.3.6 Past Mining Operations

The site is located in the Grass Valley Mining District. This district was an area of intensive gold mining activities dating back to 1849 when placer gold deposits were discovered in the sediments along Wolf Creek and nearby drainages.

Hard rock mining in the area began in the early 1850s. Uren (1897) depicts three mining properties located along the northern and eastern edges of the subject site, including the Galena, Smuggler and Yukon Jack mines. No shafts associated with those mines were depicted on the 1897 map. Logan (1930) indicates that Bullion Consolidated Mining Company holdings encompassed the northern and eastern portions of the site, as well as land to the north and east of the site. The Bullion Shaft is depicted across present day La Barr Meadows Road, approximately 400 feet to the east of the site.

The apparent portal location of the Bullion Shaft was observed east of La Barr Meadows Road. The mining maps indicate that the shaft dips to the east away from the subject site. Relic foundations for the shaft headworks were observed on both sides of La Barr Meadows Road.

According to the California State Mining Bureau (1918 and 1940), the Bullion Shaft was advanced along a 1- to 5-foot wide vein of gold-bearing quartz which dipped to the east (away from the site). The ore contained free gold, pyrite and “considerable amounts of galena” (lead sulfate). The shaft reached an inclined depth of at least 1,700 feet and reportedly ceased operating after 1906. A 10-stamp mill was located on the Bullion property.

Johnston (1939; Figure 2) indicates that the site is generally underlain by plutonic rocks without significant gold-bearing veins, except for the eastern-dipping veins exploited by the Bullion mine near the eastern property boundary, as discussed below. The Diamond tunnel, Bullion shaft and Alaska shaft are depicted near the site boundaries.

H&K reviewed anonymous and undated maps of mine workings associated with legal proceedings from the United States Circuit Court of Appeals for the Ninth Circuit in the late 1930s. According to an undated map of the surface and upper workings of the Bullion Mine at the apex of the Galena Lode, the apex of the lode within the Galena Claim roughly follows La Barr Meadows Road along the eastern edge of the site. The Bullion Shaft is shown approximately 80 feet east of La Barr Meadows Road.

One of the maps (Figure 3) indicated that approximately 90 feet of horizontal tunnels (labeled as 71 and 72 on the map) and one vertical shaft (70) are located on the site. The horizontal tunnels were labeled as part of the “30" Level, which is likely to be located less than 30 feet below ground surface, because distance to a level was typically measured along an inclined shaft. A series of surface excavations (A11, A12, A12½, A 13 and A14) and related stockpiles were also shown on the site, farther south along the eastern site boundary.

The map also indicates that a second vertical shaft (80) and approximately 25 feet of horizontal tunnel (81) are located on the eastern edge of the property. The shaft and tunnel are not depicted as being connected to other workings. It is likely that the tunnel is located on the “30" level. Exploratory trench 40 was excavated in an east-west orientation immediately south of the approximate location of shaft 80 as shown on Figure 3. An apparent mine adit was encountered at a depth of 16 to 20 feet bgs in the eastern end of the northern excavation wall. The apparent adit was roughly circular, approximately 4 feet in diameter, and appeared to be roughly horizontal. Seepage was observed at a depth of approximately 17 feet bgs, and extensive caving was observed in the excavation side wall from 9 to 20 feet bgs. The map also shows extensive workings on the “50" Level and “100" Level near the site.

Rock fill and numerous rock stockpiles in the central portion of the site may have originated from nearby historic gold mining activities. Mine waste impacted by elevated metals concentrations is to be addressed by remedial action prior to site development. The remedial action is to be overseen by DTSC.

The Diamond Tunnel (Figure 2) is located north of the site. MacBoyle (1918) describes the Diamond Claim as being owned by the Bullion Consolidated Gold Mining Company. According to the publication, the Big Diamond vein strikes north 20 degrees west and dips 45 degrees east. The vein was thought to be an extension of the Galena and Bullion vein. The Little Diamond vein dips 48 degrees south and crosses the Big Diamond vein, east to west. The veins outcrop in granodiorite. The publication describes a vertical shaft, an inclined shaft, and a 1000-foot tunnel whose workings extended to a depth of approximately 125 feet, with approximately 1200 feet of exploratory drifts. Crawford (1894) describes shaft development on the Diamond Mining and Development Company claim, but does not describe the Diamond Tunnel. A mill was located on the claim, presumably near the shaft.

Angular rock fill was encountered west, northwest and southwest of an existing concrete slab-on-grade located at the former Valley Veneer Plant location (see exploratory trenches 27, 37, 41, 42 and 43). The rock fill extended to approximately 8 feet bgs at the location of trenches 27 and 37. Granitic and metamorphic rock fragments to 12 inches in diameter with significant mineralization were observed within the fill.

Angular rock fill was also encountered in trenches 23, 45 and 46. Angular rock to 18 inches in diameter was observed within the fill, which was up to approximately 8 feet deep at the location of our trenches. Extensive caving was observed during excavation into the fill.

Exploratory trenches 1, 2, 3, 5, 9 were excavated in debris stockpiles that contained significant amounts of rock. The stockpiles also contained a large amount of soil and wood debris.

A thin layer of rock covered portions of the ground surface along the eastern edge of the northern portion of the site. Granitic and metamorphic rock fragments to 4 inches in diameter were observed.

Carlton (2005) identified an estimated 11,400 cubic yards of mine waste rock that is to be addressed as part of a remedial action under the oversight of DTSC in conjunction with site development. Sheet 2 depicts the reported locations of this rock fill.

3.4 LABORATORY TESTING

Laboratory swell testing was performed as part of H&K's 1999 investigation. Results of swell testing, which was performed on bulk soil samples CB-1, CB-3,

CB-6 and CB-9, were used to estimate soil expansion potential when remolded and subjected to an increase in moisture content. The results of swell testing are summarized in Table 1. Test results correspond to expansion potential ranging from very low to very high.

3.5 SITE SEISMICITY

H&K reviewed California Division of Mines and Geology Open File Report OFR96-08, *Probabilistic Seismic Hazard Assessment for the State of California*, and the on-line revisions and the California Geological Survey updates to the report, *2003 California Fault Parameters*. The documents categorize faults as Class A, B, or C. Class A faults are capable of producing large magnitude events, and have a high rate of slip. Class C faults are not capable of producing large magnitude earthquakes, and have a relatively low slip rate. Class B faults are all other type faults. The report indicates only B and C type faults are within 100 kilometers of the subject site.

3.5.1 Alquist-Priolo Fault Zones

The 1997 version of Special Publication 43 (updated 2003), *Fault Rupture Hazard Zones in California*, describes active faults and fault zones (activity within 11,000 years), pursuant to the Alquist-Priolo Earthquake Fault Zoning Act. According to Special Publication 43, the site area is not contained within or near an Alquist-Priolo special studies zone. The Alquist-Priolo Earthquake Fault Zoning Act was passed following the 1971 San Fernando Earthquake and only addresses the hazards associated with surface fault ruptures. Ground shaking, liquefaction, seismically induced slope instability, and other seismic hazards are not addressed by the Alquist-Priolo Act.

3.5.2 Regional Seismic Sources

According to the *California Geological Survey Fault Parameters Map* (2002), the project site is located within the Foothills Fault System that extends approximately 150 miles along the western foothills of the Sierra Nevada.

Foothills Fault System

The Foothills Fault System is a group of northwest trending, steeply dipping to vertical faults whose major tectonic activity occurred in the late Jurassic period (135 to 150 MYBP). The Foothills Fault System is designated as a Class C fault zone, with low seismicity and a low rate of recurrence. The present day hazard is

derived from the evaluation of the Foothills Fault System as an areal source, rather than as individual faults. The Foothills Fault system is believed to be capable of producing an earthquake with a maximum magnitude 6.5.

The Fault Activity Map of California and Adjacent Areas (California Division of Mines and Geology, Map No. 6, 1994) shows several known faults in the region that are part of the Foothills Fault System, including the Gillis Hill Fault, Foresthill Fault, Grass Valley Fault, and the Wolf Creek Fault Zone. One branch of the Gillis Hill Fault is within 4 miles of the site. The main branch of the Gillis Hill Fault is located approximately 6 miles east of the project site. The Wolf Creek Fault zone is approximately 1 mile west of the site. The Foresthill Fault is approximately 11 miles east of the site. These three faults are believed to have been most recently active during the Mesozoic era (65 to 230 MYBP). Segments of the Wolf Creek and Bear Mountain Fault Zones located approximately 6, 19 and 26 miles south of the site show evidence of displacement during the late Quaternary period (0.7 MYBP). The Fault Activity Map shows that the Grass Valley Fault lies approximately 2 miles north of the site. The Grass Valley Fault is depicted as either a Pre-Quaternary fault (older than 1.7 million years) or as a fault without recognized Quaternary displacement.

Other Seismic Sources

The California Geological Survey earthquake catalog (2002) identifies other potential seismic sources including the fault zones noted below. Fault hazard sources are typically those within 100 kilometers, or approximately 62.5 miles. The seismic sources within 100 kilometers of the site are designated as areal sources with the hazard distributed over a zone rather than a specific fault or fault strand. The fault zones are shown on the Fault Parameters Map presented as Figure 5.

The Western Nevada Fault Zones 1 through 3 are located in the eastern portion of California and western portion of Nevada between 55 and 96 miles east of the site. The Western Nevada zone is designated as a Class C areal zone that accommodates dextral shear from the Walker Zone, with the hazard distributed over the area of the zone. The Western Nevada Zone is capable of producing earthquakes of magnitude 7.1.

Mohawk-Honey Lake Fault Zones 3, 4, and 5 are located between 48 and 98 miles northeast of the site, north of the Western Nevada Zone. The Mohawk-Honey Lake Fault Zone is designated as a Class C dextral shear zone capable of producing magnitude 7.3 earthquakes.

3.5.3 Historic Seismicity

Several earthquakes have occurred since 1850 which have produced noticeable ground shaking in the vicinity. Some of the earthquakes felt in the area include:

- In 1867, an earthquake with estimated 5.0 magnitude occurred approximately 18 miles east of the site. No details about the earthquake were available.
- The Dunnigan Hills Fault, located approximately 54 miles southwest of the project site, is believed to be the source of the 1892 Vacaville-Winters earthquake.
- In 1909, two earthquakes with estimated Richter magnitudes of 5.0 to 5.5 occurred approximately 35 miles west-northwest of Nevada City.
- An earthquake with magnitude 6.0 on the Dog Valley fault, located near Stampede Reservoir approximately 70 miles northeast of the site, produced noticeable shaking and ground rupture in 1966.
- In 1975, a magnitude 6.2 earthquake occurred on the Cleveland Hill fault, located within the Foothills Fault System approximately 36 miles west of the site. The event was strongly felt in the Grass Valley/Nevada City area; however, no major damage or injuries were reported.
- The October 17, 1989 Loma Prieta Earthquake, measuring 7.1 magnitude and centered near Santa Cruz, produced ground shaking as far east as Reno, Nevada.
- An unnamed fault located near Emigrant Gap, approximately 13 miles east of the site, has been the source of several small earthquakes since 1989 which produced ground shaking in the Nevada City area.

3.5.4 Seismic Design Parameters

The seismic design parameters provided in Table 3.5.4.1 below are for planning purposes only and should be confirmed by a design-level geotechnical investigation. The seismic design criteria are based on Section 1613 of the 2007 California Building Code, CCR Title 24, Part 2, and were calculated using the United States Geological Survey (USGS) *Java Ground Motion Parameter Calculator, Earthquake Ground Motion Tools, Version 5.0.8*.

3.5.4.1 - Seismic Design Parameters					
Description	**Value**	**Reference**	**Description**	**Value**	**Reference**
Latitude Longitude	39.1876 -121.0448	1	Site Class	D	2
Site Coefficient, F_A	1.393	6	Site Coefficient, F_V	2.009	7
Short (0.2 sec) Spectral Response, S_S	0.509*g*	3, 5	Long (1.0 sec) Spectral Response, S_1	0.198*g*	4, 5
S_S modified for Site Class Effects, S_{MS}	0.708*g*	8, 5	S_1 modified for Site Class Effects, S_{M1}	0.397*g*	9, 5
Design Short Spectral Response, S_{DS}	0.472*g*	10, 5	Design Short Spectral Response, S_{D1}	0.265*g*	11, 5

References:

1. *USGS 7.5 min*
2. *2007 CBC, Table 1613.5.2*
3. *CBC Figure 1613.5(3)*
4. *CBC Figure 1613.5(4)*
5. *USGS Uniform Hazard Response Spectra, v 5.0.8 (ASCE 7 Standard, 2005)*
6. *2007 CBC, Table 1613.5.3(1)*
7. *2007 CBC, Table 1613.5.3(2)*
8. *2007 CBC, Equation 16-37*
9. *2007 CBC, Equation 16-38*
10. *2007 CBC, Equation 16-39*
11. *2007 CBC, Equation 16-40*

H&K's classification of the native on-site soil was based on field observation of subsurface conditions revealed in the previous exploratory trenches. The on-site soil consists of fine-grained and granular soil composed of clay, silt, sand, and gravel derived from weathering of the underlying, variably weathered, granodiorite rock. Based on the presence of residual silt and clay, we used a generalized soil classification of low plasticity silt (ML) and used Site Class D for the soil profile. A design-level report may reveal that a more favorable site class is appropriate for the site, depending on the deeper subsurface conditions encountered.

4 GEOLOGIC HAZARDS

Based on the findings of H&K's surface reconnaissance and subsurface investigations, and review of aerial photographs and published documents, H&K considered the following potential geological hazards for the site. Generalized locations associated with potential geologic hazards are depicted on Sheet 2.

4.1 SEISMIC HAZARDS

As described in Section 3 of this report, the project site is located within the Foothills Fault System and is not contained within or near an Alquist-Priolo special studies zone. H&K's opinion is that ground rupture and surface faulting at the site is not likely. The site may experience moderate ground shaking caused by earthquakes occurring along offsite faults. Earthquakes may cause cracking of concrete slabs, building walls, and pavement at the site. Secondary seismic hazards are discussed below.

4.1.1 Secondary Seismic Hazards

Ground motions may initiate secondary events such as differential compaction, liquefaction, seismically induced flooding, landslides, or seiches within large bodies of water. The likelihood of secondary seismic hazard impacts will be reduced if site grading is performed in accordance with the recommendations of a geotechnical engineering report and the California Building Code.

Differential Compaction

Major seismic shaking of loose, non-uniform soil can initiate differential soil compaction. The majority of the site is underlain by dense soil and weathered rock, and the potential hazard of differential compaction in a large earthquake is low. However, areas of existing, loose fill are present on the site and may be subject to seismically induced settlement. To avoid creating an environment for differential compaction, site grading should be performed in accordance with the recommendations of the geotechnical report. Over-excavation and replacement of loose soil, removal of organic fill material (Sheet 2), and creation of cut and fill pads should be performed in accordance with the findings of a design-level geotechnical engineering investigation to avoid conditions that would be likely to cause significant differential settlement.

Liquefaction

Soil liquefaction results from loss of bond strength during cyclic loading, such as imposed by earthquakes. Soil most susceptible to liquefaction is generally clean, loose, uniformly graded sandy soil, although gravelly soil, silts, and some clay-rich soil may be prone to liquefaction under certain conditions. The majority of on-site soil is derived from weathering of granitic rock and is not typically subject to liquefaction. The stability of fill areas and earth dams (Sheet 2) that are to be incorporated into the proposed development should be addressed as part of a design-level geotechnical engineering investigation for the project.

Seismically Induced Flooding

As noted in the Flooding section below, the project is not located within a designated flood hazard zone. The site is separated from potential open water sources by distance and topography. Other than the potential for seismically-induced earth dam instability, as mentioned above, our opinion is that the hazard of seismically induced flooding is low.

Seismically Induced Landslides

H&K did not observe evidence of landslides nor conditions that would be prone to seismically induced landslides. Our opinion is that the hazard of seismically induced landslides is low, provided that the stability of existing fill slopes is addressed as part of a design-level geotechnical investigation as described above.

4.2 FLOODING

Flood Insurance Rate Map 0602100608D, dated February 5, 1997, prepared by the Federal Emergency Management Agency (FEMA), indicates the project site is not situated within a designated special flood hazard area. The map does not necessarily identify all areas subject to flooding from local drainage sources of small size; however, H&K anticipates that localized drainage conditions are adequately addressed in the project development plans to reduce the risk of localized flooding.

4.3 LANDSLIDES

H&K observed no evidence of past slope failure at the Village at SouthHill site, other than localized erosion, and slumping and settlement of fill slopes containing loose fill and/or organic materials. H&K's opinion is that, in general, the landslide hazard at the site is low. H&K does not anticipate that the proposed improvements

are likely to be affected by possible landslides on adjacent property. The stability of existing earth dams and fill slopes (Sheet 2) that are to be incorporated into the proposed site development should be evaluated as part of a design-level geotechnical investigation for the project.

4.4 SLUMPS OR LAND SUBSIDENCE

The Village at SouthHill site is primarily underlain by soil originating from completely weathered rock. Such residual soil generally does not present a hazard of slumping or subsidence. However, H&K observed several areas of existing, untested fill (Sheet 2) and soft alluvial sediment (Sheet 2) that may not be suitable for support of site improvements.

The vertical and lateral extent of these areas has not been completely characterized. H&K did not review density testing results associated with existing fill at the site. Based on the general condition of the fill and the early date of its placement, such testing was not likely performed.

Some of the fill areas contain organic materials that are not suitable for support of site improvements. Existing fill and sediment that is to be incorporated into the proposed development should be evaluated as part of a design-level geotechnical investigation for the project. Fill material that has been deemed suitable for use as engineered fill will likely need to be reworked as part of site grading.

Loose fill and organic materials beneath foundations may contribute to future settlement-induced distress. Slopes comprised of loose fill or organic materials may increase the risk of erosion, slumping and slope failure. Options to mitigate loose or organic-rich fill include fill excavation and replacement, the use of deep foundations or mat foundations, and deep dynamic compaction.

4.5 EXPANSIVE SOIL

Clayey, potentially expansive soil was encountered in trenches 4, 10, 14, and 15 (Sheet 1), which were excavated in an area mapped as alluvium (Sheet 2) in the central-eastern portion of the site. The results of laboratory swell testing performed as part of H&K's 1999 investigation indicates that some of the soil tested has high expansion potential. The presence of potentially expansive soil within proposed improvement areas should be evaluated as part of a design-level geotechnical investigation for the project, and recommendations for mitigation of expansive soil should be based on the findings of the investigation.

4.6 SOIL CORROSION

Based on H&K's experience in the area, H&K does not anticipate that the site soil will exhibit significant sulfate content or corrosion potential. To confirm this, site soil should be tested for corrosion potential as part of a design-level geotechnical engineering investigation.

4.7 VOLCANIC HAZARDS

According to the US Geological Survey Map of Potential Areas of Volcanic Hazards (Miller, 1989), the property is not within a recognized active volcanic area. The nearest known active volcanic zone is the Mt. Lassen area, located approximately 80 miles northwest of the site.

4.8 NATURALLY OCCURRING ASBESTOS

Naturally occurring asbestos commonly occurs in geologic settings dominated by ultramafic rock and serpentinite. Ultramafic rock and serpentinite are not known to occur at the site, and the underlying granitic rock formation is typically not associated with naturally occurring asbestos. Naturally occurring asbestos was not identified as a constituent of concern for the mine waste rock at the site that originated from hard rock gold mining operations east of the site. H&K's opinion is that the likelihood of encountering naturally occurring asbestos at the site is low.

4.9 UNUSUAL OR EXCEPTIONAL CONDITIONS

4.9.1 Shallow Mining Excavation

Areas of recorded shallow mining excavation near the eastern site boundary are depicted on Sheet 2. H&K (2000) provided general recommendations pertaining to the physical closure of shallow mining excavations. The applicability of these general recommendations to the proposed site development should be confirmed as part of a design-level geotechnical investigation.

4.9.2 Elevated Metals Concentrations

According to the Master Plan (SCO, 2007), environmental conditions associated with past mining and milling activities are to be mitigated as part of a purchase agreement and pursuant to a Voluntary Cleanup Agreement (VCA) with the DTSC. Elevated concentrations of metals in mine waste at the site are considered to present a potential health concern in the event of routine exposure resulting from incidental ingestion, dust inhalation and dermal contact with affected soil. Carlton

(2005) identified approximately 11,000 cubic yards of mine waste (Sheet 2) that are to be consolidated at the site beneath a roadway or parking lot, away from surface water drainage courses, and capped with a low-permeability material. The placement location is to be surveyed, and a deed restriction is to be filed with the Nevada County Recorder's office. The cleanup plan was approved by DTSC in 2005; however, the final remedial design and cleanup are contingent upon approval and construction of The Village at SouthHill project. As outlined by SCO (2007), the following environmental remediation activities are to be performed in conjunction with grading of the site:

- Obtain approval of the final remedial design from the DTSC.
- Manage mine waste in accordance with the remedial design and document conformance.
- File a Completion Report with the DTSC.
- Survey the mine waste placement area and record deed restriction accordingly.
- Prepare an Operations and Maintenance Agreement (OMA) and obtain OMA approval from the DTSC. The OMA will identify requirements for periodic inspection and water quality monitoring.
- Obtain "Certification" of the site from the DTSC, which is subject to 5-year reviews.

4.9.3 Other Potential Conditions

H&K did not evaluate the site for the presence of radon, onsite septic systems, or high nitrate concentrations. H&K anticipates that the potential for these environmental conditions was considered as part of the site's long history of regulation by the RWQCB and DTSC. If unusual or exceptional conditions are encountered during site development, such conditions should be evaluated at that time.

5 REFERENCES

Atkinson, G.M., and Boore, D.M., 1997, Comparisons between recent ground motion relations, Seismological Research Letters, 68, 24 – 40.

California Department of Conservation, 1998. Guidelines for Evaluating and Mitigating Seismic Hazards, Special Report 117. Division of Mines and Geology.

California Department of Conservation, 1996. Probabilistic Seismic Hazard Assessment for the State of California, Open File Report OFR96-08. Division of Mines and Geology.

California Department of Conservation, 1992. The Geologic Map of the Chico Quadrangle, California. California Department of Conservation, Division of Mines and Geology.

California Department of Conservation, Division of Mines and Geology, Guidelines for Preparing Engineering Geologic Reports, DMG Note No. 44.

California Department of Transportation, 2003. Corrosion Guidelines, v1, on-line document, 51 p., http://www.dot.ca.gov/hq/esc/ttsb/corrosion/ CorrGuidelinesSept03.pdf.

California State Mining Bureau, 1940. Mines and Mineral Resources of Nevada County. State Mineralogists Report XXXVII.

Cao, T., Bryant, W.A., Roshandel, B., Branum, D., and Wills, C.J., 2003. California Fault Parameters, on-line map and fault catalog, http://www.consrv.ca.gov/ CGS/rghm/psha/fault_parameters/pdf/ 2002. California Geological Survey.

Carlton, 2005. Final Removal Action Work Plan, Bear River Mill Site, Grass Valley, California. Carlton Engineering, Inc., September 23, 2005.

Coduto, D. P., 1999. Geotechnical Engineering Principles and Practices, Prentice-Hall, N.J., 759 p.

Crawford, J.J., 1894. The *XII Report of the State Mineralogist.* California State Mining Bureau.

Federal Emergency Management Agency (FEMA), February 1997, Flood Insurance Rate Map 0602100608D for unincorporated Nevada County.

Accessed via internet at http://www.fema.gov/hazard/map/index.shtm, September 16, 2008.

Hartwell, J.G., 1880. Map of Nevada County Mining District.

H&K, 1999. Preliminary Geotechnical and Geologic Hazards Report for Bear River Mill Site, Nevada County, California. Holdrege & Kull, August 20, 1999.

H&K, 2000. Amendment to Preliminary Geotechnical and Geologic Hazards Report, Bear River Mill Site, Nevada County, California. Holdrege & Kull, January 31, 2000.

H&K, 2001. Preliminary Abandoned Mine Site Characterization for Bear River Mill Site, Nevada County, California. Holdrege & Kull, October 3, 2001.

H&K, 2005A. Preliminary Geotechnical Engineering Report for Crestview Drive / State Route 49 Intersection, Nevada County, California. Holdrege & Kull, July 13, 2005.

H&K, 2005B. Limited Environmental Site Assessment Report for Crestview Drive / State Route 49 Intersection, Grass Valley, California. Holdrege & Kull, July 19, 2005.

Hart, E.W. and Bryant, W.A., 1997. Fault-Rupture Hazard Zones in California. California Department of Conservation, Division of Mines and Geology, Special Publication No. 42.

International Conference of Building Officials and the California Building Standards Commission, 2007 California Building Code, California Code of Regulations, Title 24, Part 2, Volumes 2, 2B.

Jensen, 1999. Archeological Inventory Survey, Bear River Mill Site Development Project, Approximately 135 acres South of Grass Valley, Nevada County, California. Peter M. Jensen, Ph.D., Jensen & Associates, October 19, 1999.

Johnston, W.D., Jr., 1939. Geologic Map of the Grass Valley Quadrangle and Adjacent Area, Nevada County, California. United States Department of the Interior Geological Survey, Professional Paper 194, Plate 1, 1939.

Johnston, W.D., Jr., 1940. The Gold Quartz Veins of Grass Valley, California: U.S. Geological Survey Professional Paper 194, 1940.

Kennedy/Jenks, 1999. Phase I Environmental Site Assessment, Former Bear River Sawmill and Valley Veneer Facility, Grass Valley, California. Kennedy/Jenks Consultants, November 22, 1999.

Kramer, Steven L., 1996. Geotechnical Earthquake Engineering, Prentice Hall, Upper Saddle River, New Jersey. 653p.

Lindgren, Waldemar, 1896. The Gold Quartz Veins of Nevada City and Grass Valley Districts, California, Department of the Interior - U.S. Geological Survey, 1896, extract from the seventeenth annual report of the survey, 1895-96.

Logan, C.A., 1930. Map Showing Mining Properties of the Grass Valley Mining District, Nevada County, California. Division of Mines.

Loyd, R.C., and Clinkenbeard, J.P., 1990. Geologic Map of Western Nevada County, California, California Department of Conservation, Division of Mines and Geology, Plate 1a.

MacBoyle, Errol, 1918. State Mineralogists Report, Mines and Mineral Resources of Nevada County, California, Biennial Period 1918. California State Mining Bureau.

Miller, C. Dan, 1989. Potential Hazards from Future Volcanic Eruptions in California, USGS Bulletin 1847, http://vulcan.wr.usgs.gov/Volcanoes/California/Hazards/Bulletin1847/framework.html.

Natural Resource Conservation Service, 2007. Soil Survey of Nevada County, Web Soil Survey, http://websoilsurvey.nrcs.usda.gov/app/.

SCO, 2007. The Village at SouthHill, Grass Valley, California, Master Plan. SCO Planning and Engineering, Inc., August 2007.

Saucedo, G.J., and Wagner, D.L., et al. 1981. Geologic Map of the Chico Quadrangle, California: California Department of Conservation, Division of Mines and Geology, Regional Map Series, Map No 1A.

Seed, R.B., Cetin, K. O., Moss, R.E.S, Kammerer, A.M., Wu, J., Pestana, J.M., Reimer, M.F., Sancio, R.B., Bray, J.F.D., Kayen, R.E., and Faris, A., 2003. Recent advances in soil liquefaction engineering - a unified and consistent framework: University of California, Earthquake Engineering Research Center Report 12003 - 2006, 72 p.

Tuminas, A., 1983. Geologic Map of the Grass Valley - Colfax Area, Nevada and Placer Counties, California.

USDA, 1993. Soil Survey of Nevada County Area, California. United States Department of Agriculture Soil Conservation Service and Forest Service, reissued August 1993.

USGS, 2007. On-line Java Ground Motion Parameter Calculator, Earthquake Ground Motion Tools, Version 5.0.8. United States Geological Survey, http://earthquake.usgs.gov/research/hazmaps/design/.

USGS, 1896. Nevada City Special Folio, California. United States Geological Survey, 1896.

United States Circuit Court of Appeals for the Ninth Circuit, 1935-1937. Anonymous and undated maps of mine workings including Bullion Mine, Apex of Galena Lode, Surface and Upper Workings. Filed 1935 through 1937.

Uren, Chas E., 1897. Map of the Vicinity of Grass Valley / Nevada City, California.

6 LIMITATIONS

The following limitations apply to the findings, conclusions and recommendations presented in this report:

1. H&K's professional services were performed consistent with the generally accepted geotechnical engineering principles and practices employed in northern California. This warranty is in lieu of all other warranties, either expressed or implied.

2. These services were performed consistent with our agreement with our client. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of our services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this report. This report is solely for the use of our client unless noted otherwise. Any reliance on this report by a third party is at the party's sole risk.

3. If changes are made to the nature or design of the project as described in this report, then the conclusions and recommendations presented in this report should be considered invalid. Only our firm can determine the validity of the conclusions and recommendations presented in this report. Therefore, we should be retained to review all project changes and prepare written responses with regards to their impacts on our conclusions and recommendations. However, we may require additional fieldwork and laboratory testing to develop any modifications to our recommendations. Costs to review project changes and perform additional fieldwork and laboratory testing necessary to modify our recommendations are beyond the scope of services presented in this report. Any additional work will be performed only after receipt of an approved scope of services, budget, and written authorization to proceed.

4. The analyses, conclusions and recommendations presented in this report are based on site conditions as they existed at the time we performed our surface and subsurface field investigations, as well as review of information provided by others. We have assumed that the subsurface soil and groundwater conditions encountered at the location of our exploratory trenches are generally representative of the subsurface conditions throughout the entire project site. However, the actual subsurface conditions at locations between and beyond our exploratory trenches may differ. Therefore, if the subsurface conditions encountered during construction are different than those described

in this report, then we should be notified immediately so that we can review these differences and, if necessary, modify our recommendations.

5. The elevation or depth to groundwater underlying the project site may differ with time and location.

6. The project site map shows approximate exploratory trench locations as determined by pacing distances from identifiable site features. Therefore, the t locations should not be relied upon as being exact nor located with surveying methods.

7. Hazardous materials associated with historic mining and processing, as well as past chemical release, have been identified at the site. Project personnel should be careful and take the necessary precautions should hazardous materials be encountered during construction.

8. The findings of this report are valid as of the present date. However, changes in the conditions of the property can occur with the passage of time. The changes may be due to natural processes or to the works of man, on the project site or adjacent properties. In addition, changes in applicable or appropriate standards can occur, whether they result from legislation or the broadening of knowledge. Therefore, the recommendations presented in this report should not be relied upon after a period of two years from the issue date without our review.

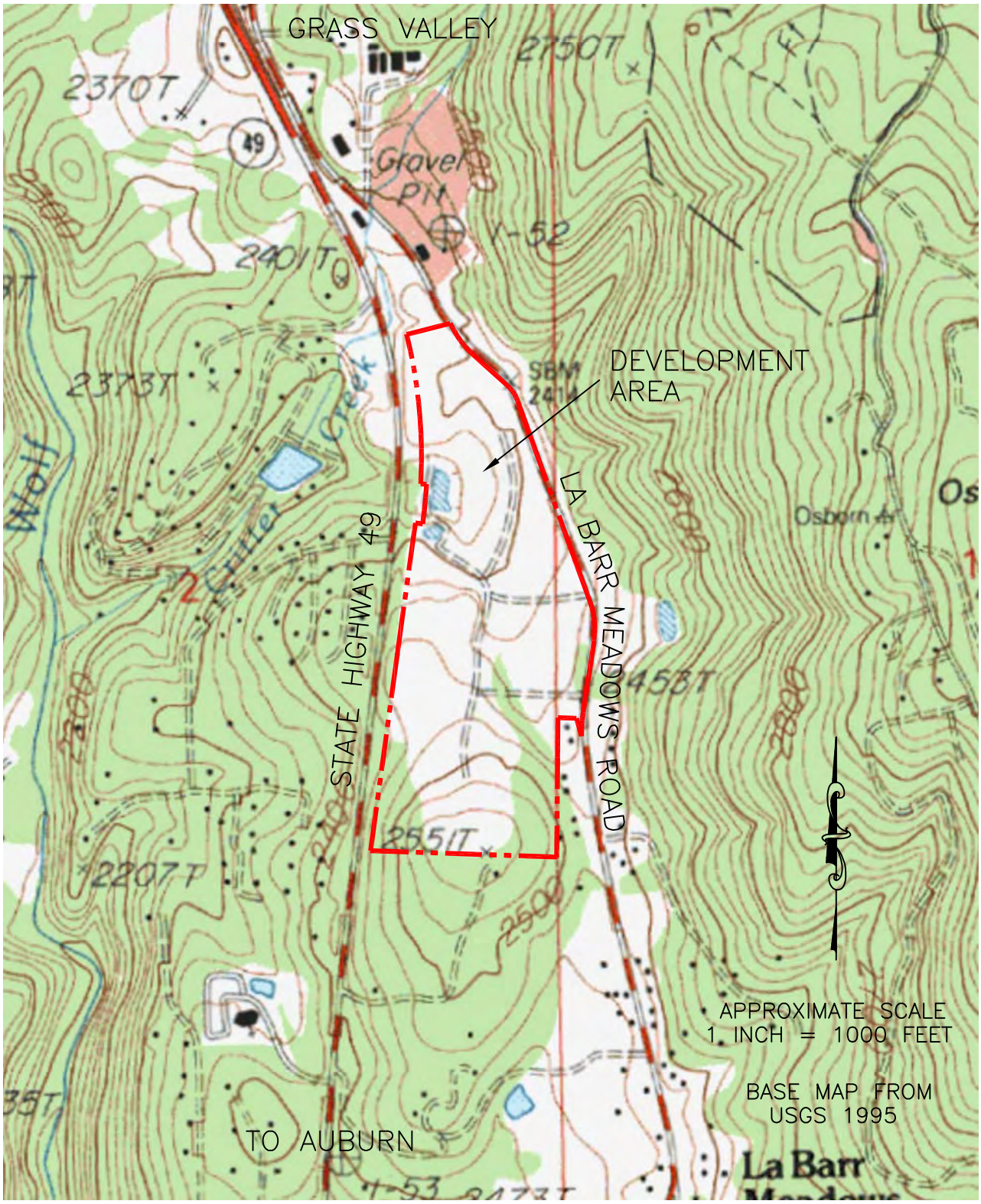
TABLES

Table 1. Laboratory Expansion Index Test Results

Sample Number	Trench Number	Sample Depth (feet)	Swell (%)	Estimated Expansion Potential
CB-1	4	0.75-1.5	1.8	Very low
CB-3	4	3.5-4.25	11.2	High
CB-6	10	4.0-4.75	13.6	Very high
CB-9	19	0.75-1.5	1.2	Very low

Note:
The samples were remolded to approximately 90% of the ASTM D 1557 maximum dry density at a moisture content below the optimum. The remolded sample was confined in a 1.0-inch thick ring and loaded with a 144 psf surcharge. The remolded sample was immersed in water, and the swell (or settlement) of the sample was measured with a dial micrometer until the micrometer readings stabilized.

FIGURES



HOLDREGE & KULL
CONSULTING ENGINEERS • GEOLOGISTS
792 SEARLS AVENUE
NEVADA CITY, CA 95959
(530) 478-1305 FAX 478-1019

LOCATION MAP

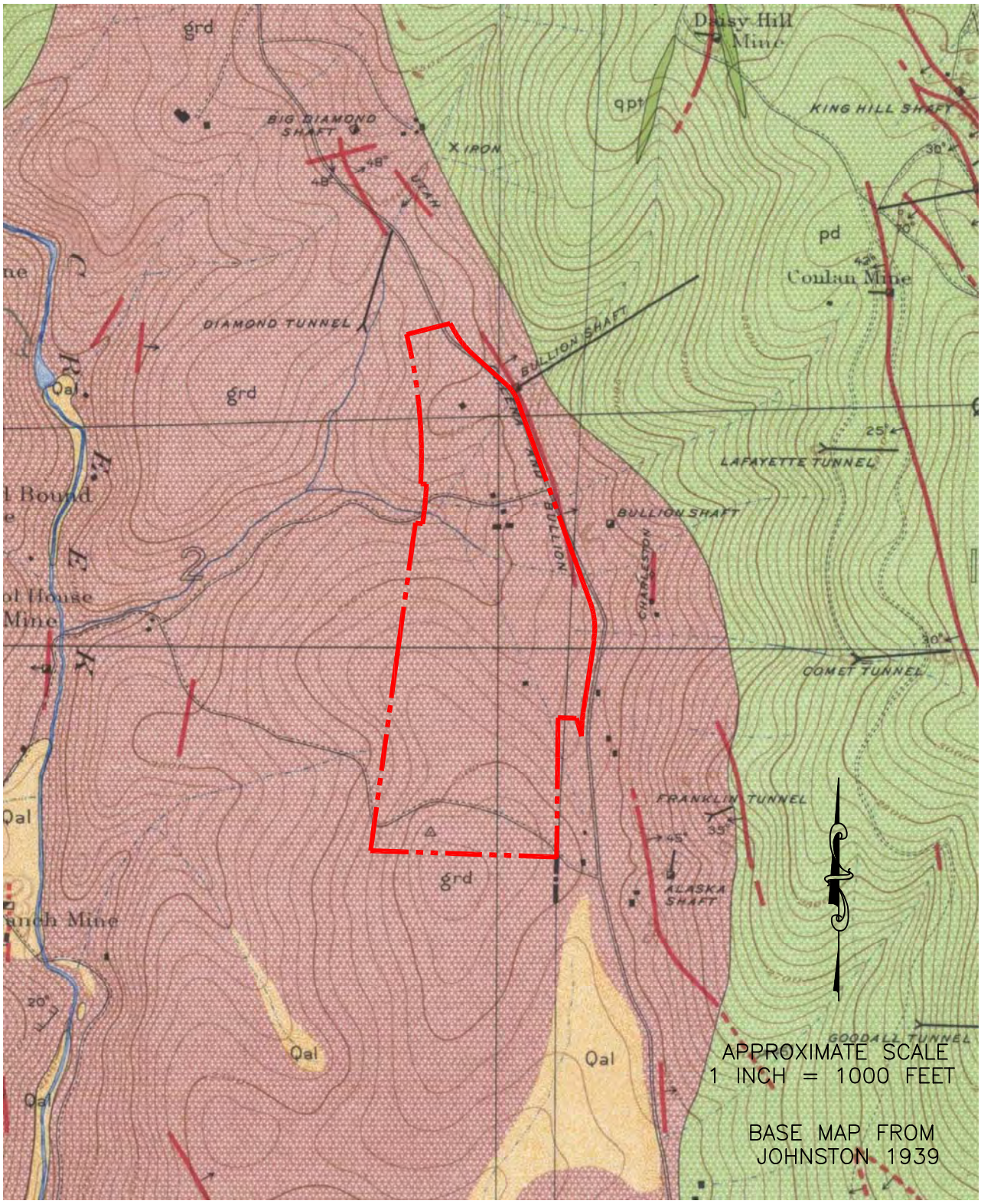
THE VILLAGE AT SOUTHHILL

NEVADA COUNTY, CALIFORNIA

PROJ NO.: 3594-01

DATE: SEPTEMBER 2008

FIGURE NO.: 1



HOLDREGE & KULL
CONSULTING ENGINEERS • GEOLOGISTS
792 SEARLS AVENUE
NEVADA CITY, CA 95959
(530) 478-1305 FAX 478-1019

1939 USGS TOPOGRAPHICAL MAP

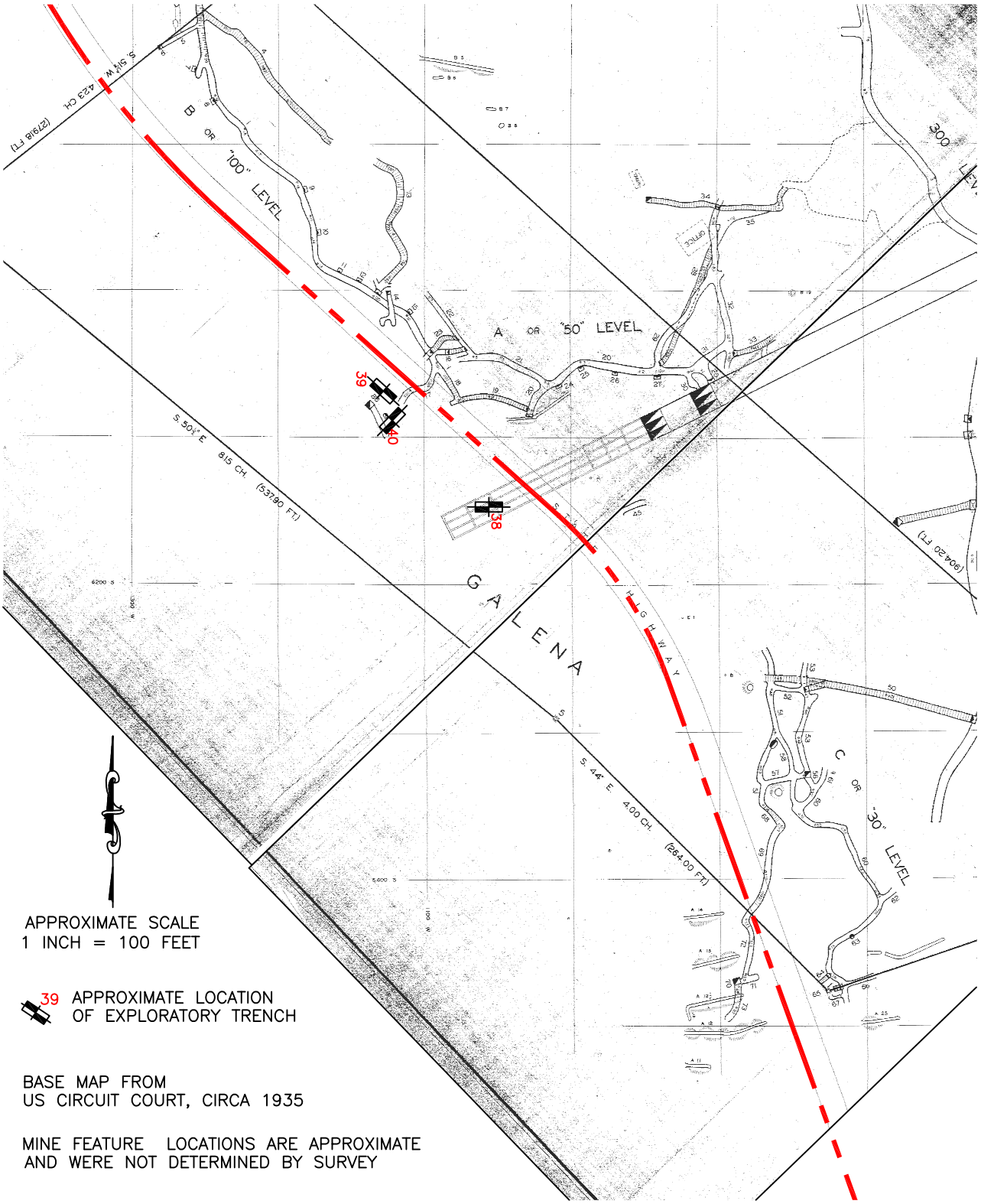
THE VILLAGE AT SOUTHHILL

NEVADA COUNTY, CALIFORNIA

PROJ NO.: 3594-01

DATE: SEPTEMBER 2008

FIGURE NO.: 2



HOLDREGE & KULL
CONSULTING ENGINEERS • GEOLOGISTS
792 SEARLS AVENUE
NEVADA CITY, CA 95959
(530) 478-1305 FAX 478-1019

BULLION MINE UPPER WORKINGS
THE VILLAGE AT SOUTHHILL
NEVADA COUNTY, CALIFORNIA

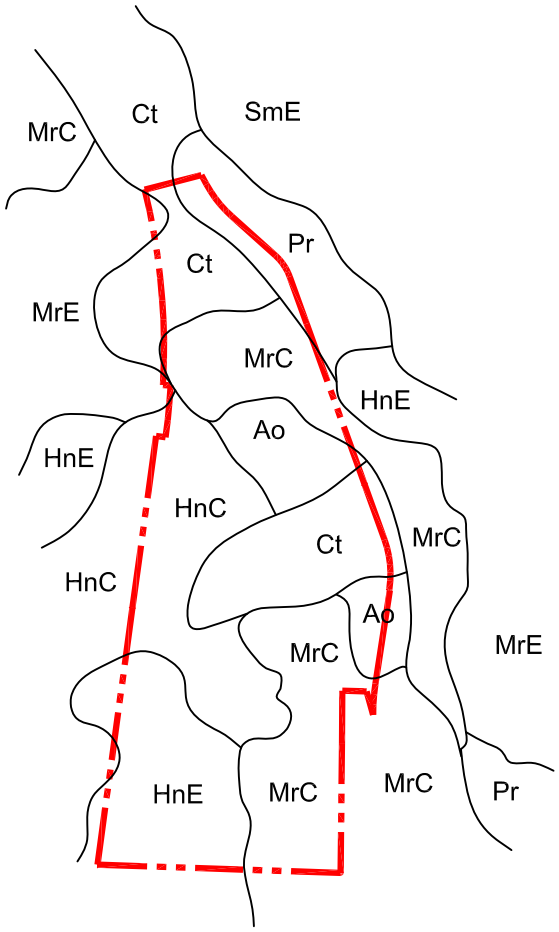
PROJ NO.: 3594-01

DATE: SEPTEMBER 2008

FIGURE NO.: 3

APPROXIMATE SCALE
1 INCH = 1000 FEET

BASE MAP FROM
USDA 1993



LEGEND

Ao	ALLUVIAL LAND, CLAYEY, 0-15% SLOPES
Ct	CUT AND FILL LAND, 0-50% SLOPES
HnC	HODA SANDY LOAM, 9-15% SLOPES
HnE	HODA SANDY LOAM, 15-50% SLOPES
MrC	MUSICK SANDY LOAM, 5-15% SLOPES
MrE	MUSICK SANDY LOAM, 15-50% SLOPES
Pr	PLACER DIGGINGS
SmE	SITES VERY STONY LOAM, 15-30% SLOPES

SOIL TYPES BASED ON SOIL SURVEY OF THE NEVADA COUNTY AREA, CALIFORNIA (USDA SOIL CONSERVATION SERVICE, 1993)

HOLDREGE & KULL
CONSULTING ENGINEERS • GEOLOGISTS
792 SEARLS AVENUE
NEVADA CITY, CA 95959
(530) 478-1305 FAX 478-1019

SOILS MAP

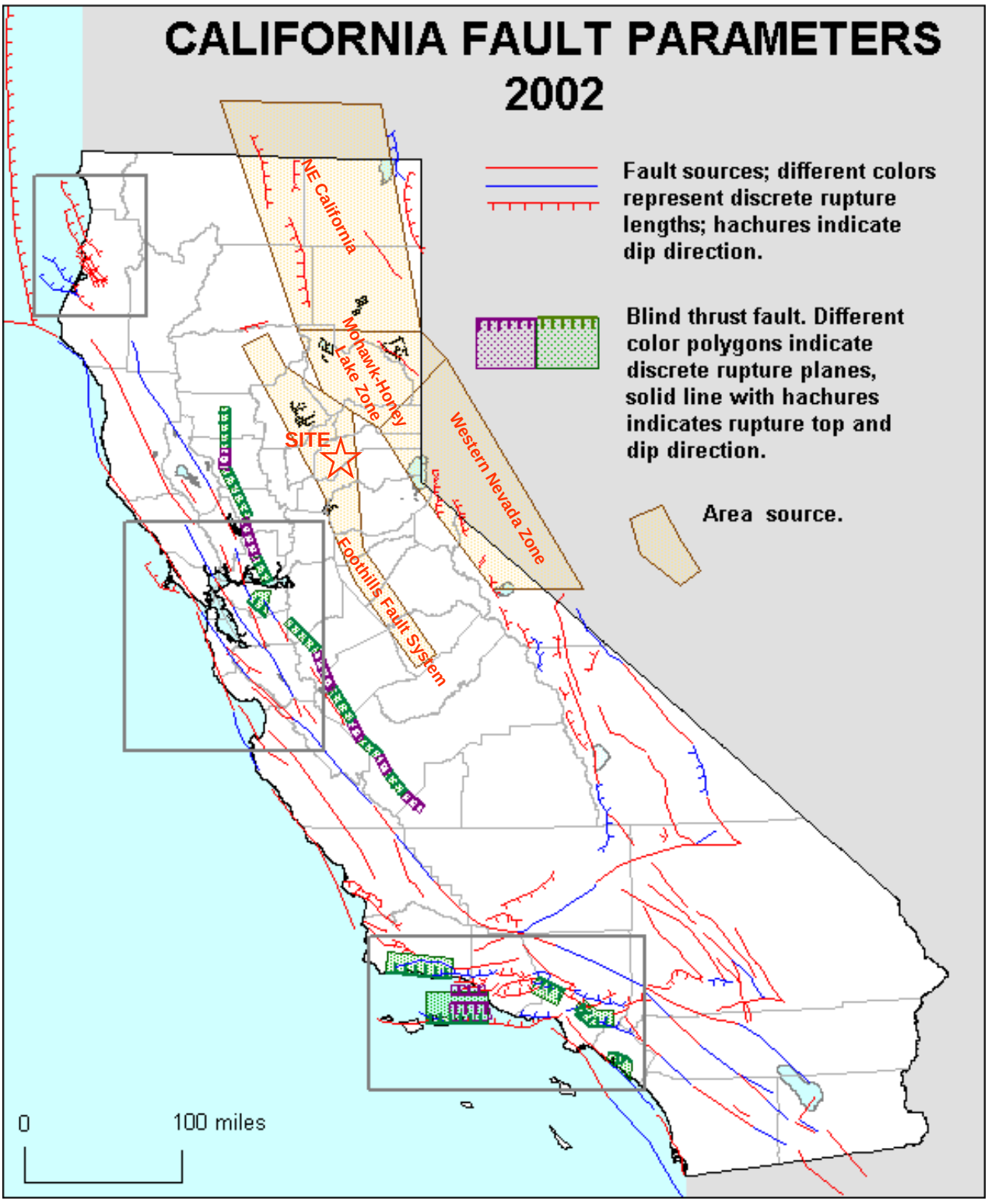
THE VILLAGE AT SOUTHHILL

NEVADA COUNTY, CALIFORNIA

PROJ NO.: 3594-01

DATE: SEPTEMBER 2008

FIGURE NO.: 4



Source: California Geological Survey, 2002, Interactive Fault Parameters Map
http://www.consrv.ca.gov/CGS/rghm/psha/fault_parameters/htm/index.htm

HOLDREGE & KULL
CONSULTING ENGINEERS • GEOLOGISTS
792 Searls Avenue • Nevada City, CA 95959
(530) 478-1305 • FAX (530) 478-1019

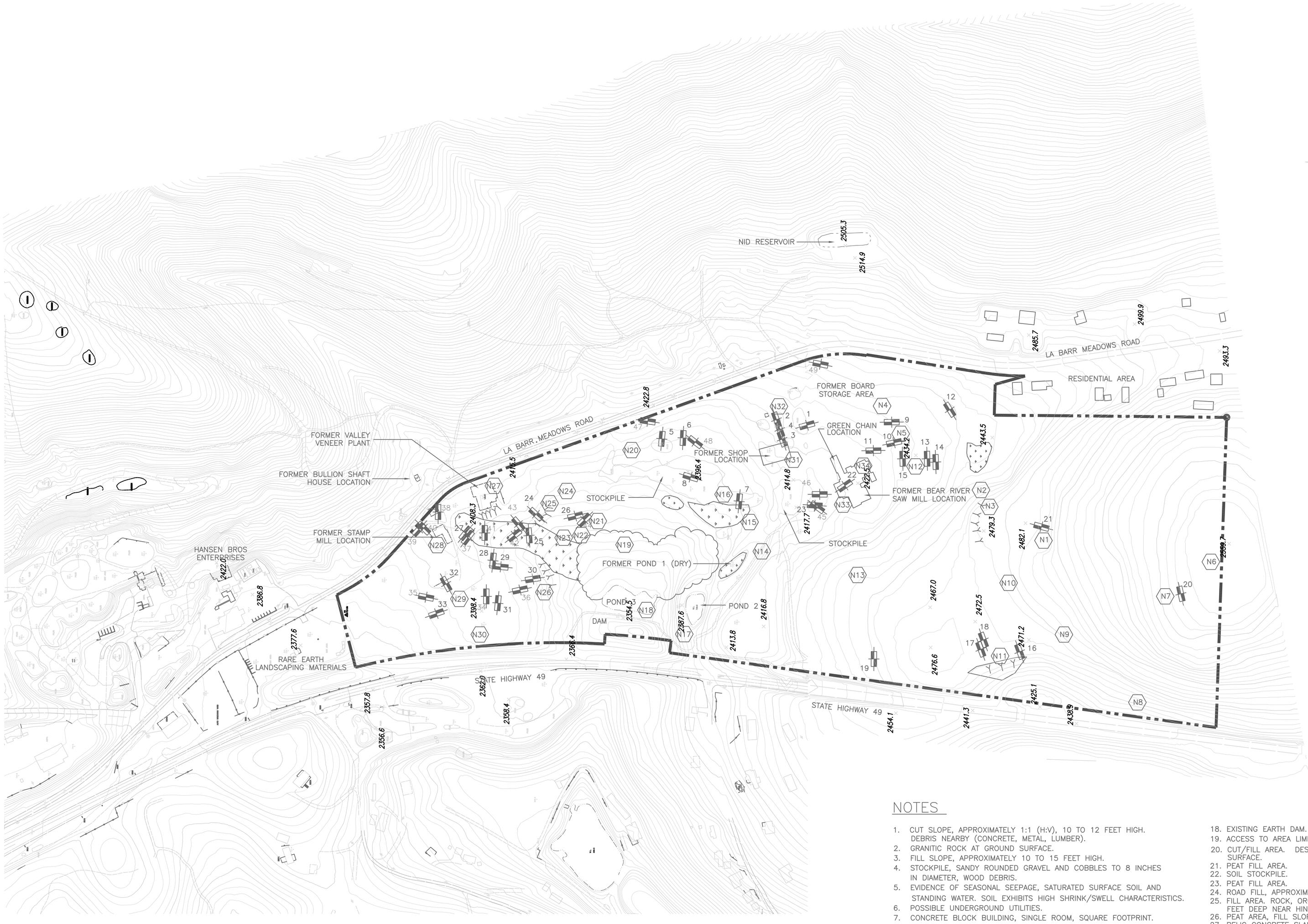
REGIONAL FAULT MAP
THE VILLAGE AT SOUTHHILL
GRASS VALLEY, CALIFORNIA

FIGURE 5
PROJECT NO. 3594-01
OCTOBER 2008

SHEETS

Sheet 1 Site Map

Sheet 2 Geologic Conditions



1" = 200'

LEGEND

- APPROXIMATE LOCATION OF EXPLORATORY TRENCH
- SATURATED SOIL CONDITIONS
- DENSE VEGETATION
- N19 NOTES
- YYY FILL SLOPE

NOTES

1. CUT SLOPE, APPROXIMATELY 1:1 (H:V), 10 TO 12 FEET HIGH. DEBRIS NEARBY (CONCRETE, METAL, LUMBER).
2. GRANITIC ROCK AT GROUND SURFACE.
3. FILL SLOPE, APPROXIMATELY 10 TO 15 FEET HIGH.
4. STOCKPILE, SANDY ROUNDED GRAVEL AND COBBLES TO 8 INCHES IN DIAMETER, WOOD DEBRIS.
5. EVIDENCE OF SEASONAL SEEPAGE, SATURATED SURFACE SOIL AND STANDING WATER. SOIL EXHIBITS HIGH SHRINK/SWELL CHARACTERISTICS.
6. POSSIBLE UNDERGROUND UTILITIES.
7. CONCRETE BLOCK BUILDING, SINGLE ROOM, SQUARE FOOTPRINT.
8. DEBRIS, RUBBISH.
9. POSSIBLE MINE WASTE ROCK.
10. DEBRIS, RUBBISH.
11. FILL AREA. HIGH ORGANIC CONTENT, WOOD DEBRIS. MORE THAN 13 FEET DEEP NEAR HINGE POINT.
12. FILL AREA, HIGH ORGANIC CONTENT. 6 TO 9 FEET DEEP IN EXPLORATORY TRENCH.
13. GRANITIC ROCK AT GROUND SURFACE.
14. ROADWAY CUT/FILL.
15. EROSIONAL GULLIES DRAIN TO NORTH.
16. SEASONAL SEEPAGE AND SATURATED SURFACE SOIL.
17. RELIC SADDLE FOUNDATION, WATER CONVEYANCE, OUTLET STRUCTURE.
18. EXISTING EARTH DAM. EVIDENCE OF SEEPAGE AND BREECHING.
19. ACCESS TO AREA LIMITED BY DENSE VEGETATION.
20. CUT/FILL AREA. DESICCATION CRACKS OBSERVED AT GROUND SURFACE.
21. PEAT FILL AREA.
22. SOIL STOCKPILE.
23. PEAT FILL AREA.
24. ROAD FILL, APPROXIMATELY 3 FEET DEEP.
25. FILL AREA. ROCK, ORGANICS, WOOD DEBRIS. APPROXIMATELY 8 FEET DEEP NEAR HINGE POINT OF SLOPE.
26. PEAT AREA, FILL SLOPE ON SOUTH EDGE.
27. RELIC CONCRETE SLAB-ON-GRADE, 12 INCHES THICK IN EXPOSED SECTION. FILL TO WEST OF SLAB MAY BE MORE THAN 10 FEET DEEP BASED ON TOPOGRAPHY.
28. CONCRETE SLAB ON GRADE. LIKELY SHALLOW FILL UNDER NORTH PORTION.
29. LOCAL DEPRESSION, SEASONAL PONDING.
30. DEBRIS, RUBBISH.
31. DEBRIS.
32. DEBRIS STOCKPILES. SOIL, ROCK WOOD, CONCRETE, METAL.
33. ROCK FILL AREA, POSSIBLE RELIC SUBDRAIN.
34. RELIC MILL SITE. CONCRETE SLABS ON GRADE TO 14 INCHES THICK WITH #5 REBAR WHERE OBSERVED. STEEL TO 7/8" THICK. CONCRETE WALLS TO 12" THICK WITH #5 REBAR. MISCELLANEOUS PILES OF BROKEN CONCRETE AND DEBRIS.

BASE MAP PREPARED BY

SCO PLANNING AND ENGINEERING, INC.

NO.	REVISIONS	DATE

DESIGNED BY:	JWM
DRAWN BY:	DFD
DATE:	SEPTEMBER 2008
DRAWING NAME:	3594-01.SH1
PROJECT NO.:	3594-01

SITE MAP
THE VILLAGE AT SOUTHHILL
NEVADA COUNTY, CALIFORNIA

HOLDRECE & KULL
CONSULTING ENGINEERS • GEOLOGISTS
792 SEARLS AVENUE
NEVADA CITY, CA 95959
(530) 478-1305 FAX 478-1019

1" = 200'

NID RESERVOIR
2505.3
2514.9
2499.9
2485.7
2493.3
LA BARR MEADOWS ROAD
RESIDENTIAL AREA
FORMER BOARD STORAGE AREA
GREEN CHAIN LOCATION
FORMER SHOP LOCATION
FORMER BEAR RIVER SAW MILL LOCATION
STOCKPILE
STOCKPILE
FORMER VALLEY VENEER PLANT
FORMER BULLION SHAFT HOUSE LOCATION
FORMER STAMP MILL LOCATION
HANSEN BROS ENTERPRISES
FORMER POND 1 (DRY)
POND 3
DAM
POND 2
RARE EARTH LANDSCAPING MATERIALS
STATE HIGHWAY 49
STATE HIGHWAY 49
2422.8
2386.8
2377.6
2357.8
2356.6
2362.4
2358.4
2398.4
2361.4
2387.6
2413.8
2416.8
2414.8
2417.7
2408.3
2420.5
2434.2
2443.5
2467.0
2472.5
2476.6
2479.3
2482.7
2441.2
2425.1
2438.9
2454.1
2441.3

LEGEND

- EXISTING UNTESTED FILL WITH VARIABLE ORGANIC CONTENT
- POTENTIAL SATURATED SOIL CONDITIONS AND SHALLOW SEEPAGE
- EXISTING EARTH DAMS
- AREAS OF RECORDED MINING EXCAVATION (SEE FIGURE 3)
- IDENTIFIED MINE WASTE FILL AREAS
- MAPPED ALLUVIAL AREAS (SEE FIGURE 4 AND USGS 1993)

BASE MAP PREPARED BY
SCO PLANNING AND ENGINEERING, INC.

NO.	REVISIONS	DATE

DESIGNED BY: JWM
DRAWN BY: JWM
DATE: SEPTEMBER 2008
DRAWING NAME: 3594-01.SH2
PROJECT No.: 3594-01

GEOLOGIC CONDITIONS
THE VILLAGE AT SOUTHHILL
NEVADA COUNTY, CALIFORNIA

HOLDRECE & KULL
CONSULTING ENGINEERS • GEOLOGISTS
792 SEARLS AVENUE
NEVADA CITY, CA 95959
(530) 478-1305 FAX 478-1019

APPENDIX A EXPLORATORY TRENCH LOGS

TRENCH 1

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977–01	BEAR RIVER MILL SITE	2425 FEET MSL	8/5/99	1 OF 1	1

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	NONE	NONE	0 – 7 FEET

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			1	OL	DARK BROWN, MOIST, LOOSE SANDY SILT WITH ORGANICS (PEAT, WOOD DEBRIS) AND UP TO 50% SUBANGULAR TO SUBROUNDED GRAVEL AND COBBLES, 3 TO 12 INCH DIAMETER (STOCKPILE IS UNSUITABLE FOR USE AS STRUCTURAL FILL)
			2		
			3		
			4		
			5		
			6		
			7		TRENCH TERMINATED AT 7 FEET AT BOTTOM OF STOCKPILE
			8		
			9		
			10		

HOLDREGE & KULL

TRENCH 2

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977–01	BEAR RIVER MILL SITE	2425 FEET MSL	8/5/99	1 OF 1	2

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	NONE	NONE	0 – 7.5 FEET

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			1	OL	DARK BROWN, MOIST, LOOSE SANDY SILT WITH ORGANICS (PEAT, WOOD DEBRIS) AND APPROXIMATELY 10% GRAVEL AND COBBLES, 3 TO 12 INCH DIAMETER (STOCKPILE UNSUITABLE FOR USE AS STRUCTURAL FILL)
			2		
			3		
			4		INTERBEDS OF ORANGE BROWN, MOIST, LOOSE, SILTY SAND WITH ROCK
			5		
			6		
			7		
			8		TRENCH TERMINATED AT 7.5 FEET NEAR BASE OF STOCKPILE
			9		
			10		

HOLDREGE & KULL

TRENCH 3

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977–01	BEAR RIVER MILL SITE	2427 FEET MSL	8/5/99	1 OF 1	3

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	NONE	NONE	0 – 6.5 FEET

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			1	OL	DARK BROWN, MOIST, LOOSE SANDY SILT WITH ORGANICS (PEAT, WOOD DEBRIS), GRAVEL AND COBBLES (3 TO 12 INCH DIAMETER), AND METAL DEBRIS (STOCKPILE UNSUITABLE FOR USE AS STRUCTURAL FILL)
			2		
			3		
			4		
			5		
			6		
			7		TRENCH TERMINATED AT 6.5 FEET NEAR BOTTOM OF STOCKPILE
			8		
			9		
			10		

HOLDREGE & KULL

TRENCH 4

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977–01	BEAR RIVER MILL SITE	2424 FEET MSL	8/5/99	1 OF 1	4

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	SLIDE HAMMER	5 FEET	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
CB–1			1	CL	DARK RED BROWN, DRY TO SLIGHTLY MOIST, STIFF, SILTY CLAY TO CLAYEY FINE SAND WITH MINOR GRAVEL
4–1					
CB–2			2	CL	RED BROWN, MOIST TO DAMP, MEDIUM, SANDY CLAY WITH GRAVEL
CB–3			3 4	CH	YELLOW BROWN, DAMP TO WET, MEDIUM CLAY WITH MINOR GRAVEL
			5		STANDING WATER AT 5 FEET
			6 7 8 9 10		TRENCH TERMINATED AT 5.5 FEET

HOLDREGE & KULL

TRENCH 5

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977–01	BEAR RIVER MILL SITE	2406 FEET MSL	8/5/99	1 OF 1	5

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	NONE	NONE	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			1	OL	DARK BROWN, MOIST, LOOSE SANDY SILT WITH ORGANICS (PEAT, WOOD DEBRIS) INTERBEDDED WITH MINOR ORANGE BROWN TO YELLOW BROWN, MOIST TO DAMP, LOOSE, CLAYEY SILT (STOCKPILE IS UNSUITABLE FOR USE AS STRUCTURAL FILL)
			2		
			3		
			4		
			5		
			6		
			7		
			8		
			9		TRENCH TERMINATED AT 9 FEET NEAR BASE OF STOCKPILE
			10		

HOLDREGE & KULL

TRENCH 6

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977–01	BEAR RIVER MILL SITE	2404 FEET MSL	8/5/99	1 OF 1	6

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	SLIDE HAMMER	SEEPAGE AT 7 FEET	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			1	SM	MEDIUM BROWN TO YELLOW BROWN, DRY, MEDIUM DENSE, SILTY FINE SAND WITH MINOR CLAY AND COMMON ROOTS (FINE TO MEDIUM)
6–1					
			2	ML	YELLOW BROWN, DRY TO SLIGHTLY MOIST, MEDIUM DENSE, CLAYEY SILT WITH FINE SAND
6–2					
			3	ML	COMPLETELY WEATHERED GRANODIORITE ROCK (EXCAVATES AS LIGHT GREY, MOIST TO DAMP, MEDIUM DENSE, CLAYEY SILT)
			4		
			5		
			6		
			7		MINOR SEEPAGE AT 7 FEET
			8		TRENCH TERMINATED AT 8 FEET
			9		
			10		

HOLDREGE & KULL

TRENCH 7

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977–01	BEAR RIVER MILL SITE	2402 FEET MSL	8/5/99	1 OF 1	7

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	NONE	SEEPAGE AT 2 FEET	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			0	OL	MEDIUM BROWN, WET, LOOSE, SANDY SILT WITH DENSE ROOTS
			1	OL	DARK GREY, WET, LOOSE, SANDY SILT WITH ORGANICS SEEPAGE AT 2 FEET
			2	OL	DARK GREY, WET, LOOSE, SILTY CLAY WITH ORGANICS
			3		
			4		
			5		TRENCH TERMINATED AT 4.5 FEET
			6		
			7		
			8		
			9		
			10		

HOLDREGE & KULL

TRENCH 8

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977-01	BEAR RIVER MILL SITE	2398 FEET MSL	8/5/99	1 OF 1	8

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	NONE	NONE	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			1	ML	ORANGE BROWN, DRY TO DAMP, LOOSE, CLAYEY SILT WITH VARIABLE FINE SAND CONTENT AND POCKETS OF WOOD DEBRIS (STOCKPILE REQUIRES SELECTIVE BORROW)
			2		
			3		
			4		INCREASING MOISTURE WITH DEPTH
			5		
			6		
			7		
			8	ML	MEDIUM BROWN TO YELLOW BROWN, DAMP, MEDIUM DENSE, SANDY SILT (APPARENT ORIGINAL GROUND SURFACE)
			9		TRENCH TERMINATED AT 8 FEET
			10		

HOLDREGE & KULL

TRENCH 9

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977–01	BEAR RIVER MILL SITE	2432 FEET MSL	8/5/99	1 OF 1	9

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	NONE	NONE	0 – 7 FEET

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			0	OL	DARK BROWN, DRY TO MOIST, SANDY SILT WITH ORGANICS (WOOD DEBRIS), MINOR DEBRIS (STEEL, RUBBER) AND ABUNDANT GRAVEL AND COBBLES TO 8 INCHES IN DIAMETER (STOCKPILE IS UNSUITABLE FOR USE AS STRUCTURAL FILL)
			4	OL	DARK BROWN, MOIST TO DAMP, LOOSE, SANDY SILT WITH ORGANICS (WOOD DEBRIS), MINOR GRAVEL, AND MINOR DEBRIS (STOCKPILE IS UNSUITABLE FOR USE AS STRUCTURAL FILL)
			7	ML	DARK BROWN, MOIST TO DAMP, LOOSE, SANDY SILT WITH MINOR ORGANICS (SELECTIVE BORROW MAY BE POSSIBLE)
			8		TRENCH TERMINATED AT 8 FEET NEAR BOTTOM OF STOCKPILE

HOLDREGE & KULL

TRENCH 10

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977-01	BEAR RIVER MILL SITE	2428 FEET MSL	8/5/99	1 OF 1	10

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	SLIDE HAMMER	NONE	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			1	SM	MEDIUM BROWN, DRY, LOOSE, SILTY FINE SAND WITH MINOR DEBRIS AND VARIABLE ROCK CONTENT (UP TO APPROXIMATELY 50%) (FILL)
CB-7			2	SW	LIGHT GREY, MOIST, LOOSE, FINE TO MEDIUM SAND (FILL)
			3	SM	DARK BROWN, MOIST, LOOSE, SILTY FINE SAND WITH MINOR CLAY AND WOOD DEBRIS (FILL – POSSIBLE RELIC CULVERT BACKFILL)
CB-6			4 5 6	CH	YELLOW BROWN, MOIST, MEDIUM, FINE SANDY CLAY
			7 8 9 10		TRENCH TERMINATED AT 6.5 FEET

HOLDREGE & KULL

TRENCH 11

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977–01	BEAR RIVER MILL SITE	2424 FEET MSL	8/5/99	1 OF 1	11

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	NONE	SEEPAGE AT 5.5 FEET	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			1	ML	DARK RED BROWN, MOIST, LOOSE, SANDY SILT WITH CLAY, MINOR ROCK AND MINOR DEBRIS (FILL)
			2		CONCRETE FOUNDATION (WALL) EXPOSED AT 2 FEET BGS EXTENDS BELOW BOTTOM OF EXCAVATION
			3		
			4		
			5		MINOR SEEPAGE AT 5.5 FEET
			6	CL	YELLOW BROWN, DAMP, MEDIUM, FINE SANDY CLAY
			7		
			8		TRENCH TERMINATED AT 8 FEET
			9		
			10		

HOLDREGE & KULL

TRENCH 12

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977–01	BEAR RIVER MILL SITE	2440 FEET MSL	8/5/99	1 OF 1	12

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	NONE	NONE	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			1	SC	DARK BROWN TO RED BROWN, DRY, LOOSE TO MEDIUM DENSE, CLAYEY SAND AND CLAYEY SILT (ALLUVIAL DEPOSIT)
			2	ML	DARK BROWN, DRY, MEDIUM DENSE, FINE SANDY SILT
			3		TRENCH TERMINATED AT 3 FEET (REUSAL OF BACKHOE ON GRANODIORITE ROCK)
			4		
			5		
			6		
			7		
			8		
			9		
			10		

HOLDREGE & KULL

TRENCH 13

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977-01	BEAR RIVER MILL SITE	2435 FEET MSL	8/5/99	1 OF 1	13

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	NONE	NONE	3-9 FEET

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			1	ML	MEDIUM BROWN TO DARK BROWN, DRY TO MOIST, LOOSE, SANDY SILT (FILL)
			2		
			3		
			4	PT	WOOD DEBRIS, BURNT WOOD DEBRIS (FILL)
			5		
			5	ML	MEDIUM BROWN TO DARK BROWN, DRY TO MOIST, LOOSE, SANDY SILT (FILL)
			6		
			7	CL	YELLOW BROWN, DAMP, SOFT CLAY WITH ABUNDANT ROCK TO 3 INCHES IN DIAMETER (FILL)
			8		2 FOOT DIAMETER CMP CULVERT AT 8 FEET BGS BEARING ROUGHLY NORTH-SOUTH
			9	CL	BLUE GREY MOTTLED WITH YELLOW BROWN, MOIST, STIFF CLAY WITH FINE SAND (NATIVE)
			10		TRENCH TERMINATED AT 10 FEET

HOLDREGE & KULL

TRENCH 14

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977-01	BEAR RIVER MILL SITE	2434 FEET MSL	8/5/99	1 OF 1	14

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	NONE	NONE	2-6 FEET

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			1	OL	MEDIUM BROWN TO DARK BROWN, DRY TO MOIST, LOOSE, SANDY SILT WITH ORGANICS (WOOD DEBRIS) (FILL)
			2		
			3		
			4		
			5		
			6		
			7	CL	BLUE GREY MOTTLED WITH YELLOW BROWN, MOIST, STIFF CLAY WITH FINE SAND (NATIVE)
			8		
			9		TRENCH TERMINATED AT 10 FEET
			10		

HOLDREGE & KULL

TRENCH 15

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977–01	BEAR RIVER MILL SITE	2430 FEET MSL	8/5/99	1 OF 1	15

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	NONE	NONE	0–7 FEEET

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			1	OL	MEDIUM BROWN TO DARK BROWN, DRY TO MOIST, LOOSE, SANDY SILT WITH ORGANICS (WOOD DEBRIS) (FILL)
			2		
			3		
			4		
			5		
			6		
			7	CL	BLUE GREY MOTTLED WITH YELLOW BROWN, MOIST, STIFF CLAY WITH FINE SAND (NATIVE)
			8		
			9		
			10		TRENCH TERMINATED AT 10 FEET

HOLDREGE & KULL

TRENCH 16

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977-01	BEAR RIVER MILL SITE	2430 FEET MSL	8/5/99	1 OF 1	16

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	NONE	NONE	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			1	OL	MEDIUM BROWN TO DARK BROWN, DRY TO MOIST, LOOSE TO MEDIUM DENSE, SANDY SILT INTERBEDDED WITH ORGANICS (WOOD DEBRIS) (FILL)
			2		
			3		
			4		
			5		
			6		
			7		
			8		
			9		
			10		16 INCH DIAMETER LOG ENCOUNTERED AT 10 FEET BGS
			11	ML	RED BROWN, DAMP, MEDIUM DENSE, CLAYEY SILT
			12	CL	YELLOW BROWN TO ORANGE BROWN, MOIST, FIRM, SILTY CLAY (NATIVE)
			13		TRENCH TERMINATED AT 13 FEET
			14		
			15		
			16		
			17		
			18		
			19		
			20		

HOLDREGE & KULL

TRENCH 17

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977–01	BEAR RIVER MILL SITE	2470 FEET MSL	8/5/99	1 OF 1	17

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	NONE	NONE	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			1	OL	MEDIUM BROWN TO DARK BROWN, DRY TO MOIST, LOOSE TO MEDIUM DENSE, SANDY SILT INTERBEDDED WITH ORGANICS (WOOD DEBRIS) (FILL)
			2		
			3		
			4		TRENCH TERMINATED AT 4 FEET (REFUSAL OF BACKHOE ON LARGE WOOD DEBRIS)
			5		
			6		
			7		
			8		
			9		
			10		

HOLDREGE & KULL

TRENCH 18

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977–01	BEAR RIVER MILL SITE	2470 FEET MSL	8/5/99	1 OF 1	18

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	NONE	NONE	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			1	ML	LIGHT ORANGE BROWN, DRY TO SLIGHTLY MOIST, MEDIUM DENSE, SANDY SILT WITH MINOR CLAY
			2		
			3		TRENCH TERMINATED AT 3 FEET
			4		
			5		
			6		
			7		
			8		
			9		
			10		

HOLDREGE & KULL

TRENCH 19

PROJECT NO.	PROJECT NAME	2460	DATE	PAGE	FIGURE NO.
977–01	BEAR RIVER MILL SITE	2460 FEET MSL	8/5/99	1 OF 1	19

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	SLIDE HAMMER	NONE	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
CB–9			0–2	ML	DARK ORANGE BROWN, DRY, MEDIUM DENSE, CLAYEY SILT
19–1			2–7	ML	COMPLETELY WEATHERED GRANODIORITE ROCK (EXCAVATES AS ORANGE BROWN, MOIST, MEDIUM DENSE SILT WITH MINOR SAND)
			7		TRENCH TERMINATED AT 7 FEET

HOLDREGE & KULL

TRENCH 20

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977–01	BEAR RIVER MILL SITE	2548 FEET MSL	8/5/99	1 OF 1	20

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	SLIDE HAMMER	NONE	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
CB–10			1	ML	DARK RED BROWN TO ORANGE BROWN, DRY, MEDIUM DENSE TO DENSE, CLAYEY SILT WITH OCCASIONAL ROCK TO 12 INCHES IN DIAMETER
			2		
			3		
			4	ML	COMPLETELY WEATHERED GRANODIORITE ROCK (EXCAVATES AS ORANGE BROWN, DRY, DENSE, SANDY SILT) INCREASING ROCK STRUCTURE WITH DEPTH
			5		TRENCH TERMINATED AT 5 FEET
			6		
			7		
			8		
			9		
			10		

HOLDREGE & KULL

TRENCH 21

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977-01	BEAR RIVER MILL SITE	2484 FEET MSL	8/5/99	1 OF 1	21

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	NONE	NONE	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
				GP	ANGULAR ROCK TO 3 INCHES IN DIAMETER
				ML	LIGHT BROWN, DRY, LOOSE, SANDY SILT
			1		COMPLETELY TO MODERATELY WEATHERED ROCK (EXCAVATES AS ORANGE BROWN, DRY TO SLIGHTLY MOIST, MEDIUM DENSE, SILTY SAND WITH COBBLES)
			2	SM	
			3		
			4		TRENCH TERMINATED AT 4 FEET
			5		
			6		
			7		
			8		
			9		
			10		

HOLDREGE & KULL

TRENCH 22

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977–01	BEAR RIVER MILL SITE	2420 FEET MSL	8/6/99	1 OF 1	22

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	NONE	SEEPAGE AT 5.5 FEET	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			1	PT	ORGANICS (PEAT, WOOD DEBRIS)
			2	SC	DARK BROWN, MOIST, LOOSE, CLAYEY SAND WITH ROCK TO 12 INCHES IN DIAMETER (FILL)
			3	SC	LIGHT GREY MOTTLED WITH ORANGE BROWN, DAMP, LOOSE TO MEDIUM DENSE, CLAYEY SAND WITH ROCK (FILL)
			4		
			5		SEEPAGE AT 5.5 FEET
			6	CL	ORANGE BROWN MOTTLED WITH LIGHT GREY, MOIST, MEDIUM SANDY CLAY
			7		
			8		TRENCH TERMINATED AT 8 FEET
			9		
			10		

HOLDREGE & KULL

TRENCH 23

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977–01	BEAR RIVER MILL SITE	2416 FEET MSL	8/6/99	1 OF 1	23

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	NONE	NONE	0 – 8 FEET

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			1		ANGULAR ROCK TO 18 INCHES IN DIAMETER WITH VARIABLE SOIL CONTENT (BROWN SILTY SAND) AND MINOR DEBRIS (METAL) (FILL)
			2		THREE APPARENTLY RELIC ELECTRICAL CONDUITS SEVERED IN EXCAVATION AT APPROXIMATELY 2.5 FEET (ALUMINUM STRANDS, PLASTIC CASING, BEARING NORTH–SOUTH)
			3		
			4	GP	PERFORATED, APPROXIMATELY 12 INCH DIAMETER CORRUGATED METAL PIPE ENCOUNTERED AT 4 FEET (POSSIBLE RELIC SUBSURFACE DRAIN)
			5		
			6		
			7		
			8		TRENCH TERMINATED AT 8 FEET (EXTENSIVE CAVING)
			9		
			10		

HOLDREGE & KULL

TRENCH 24

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977–01	BEAR RIVER MILL SITE	2392 FEET MSL	8/6/99	1 OF 1	24

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	NONE	NONE	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			1	GP PT	ANGULAR ROCK TO 3 INCH DIAMETER WITH ORGANICS (PEAT) (FILL)
			2	OL	DARK YELLOW BROWN TO GREY, MOIST, SOFT TO MEDIUM, SANDY CLAY WITH ORGANICS (WOOD DEBRIS) (FILL)
			3		24 INCH DIAMETER LOG AT APPROXIMATELY 3 FEET
			4	OH	DARK BLUE GREY, MOIST TO DAMP, SOFT TO MEDIUM, SANDY CLAY (FILL)
			5		STEEL CABLE AT APPROXIMATELY 4 FEET
			6		
			7		
			8	CL	YELLOW BROWN, MOIST, FIRM, SILTY CLAY (NATIVE)
			9		TRENCH TERMINATED AT 9 FEET
			10		

HOLDREGE & KULL

TRENCH 25

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977–01	BEAR RIVER MILL SITE	2324 FEET MSL	8/6/99	1 OF 1	25

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	NONE	NONE	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			1	OL	DARK BROWN, DRY, LOOSE, SANDY SILT WITH ORGANICS (PEAT, WOOD DEBRIS) (FILL)
			2	PT	PEAT, WOOD DEBRIS (FILL)
			3	PT	ANGULAR ROCK AND WOOD DEBRIS INTERBEDDED WITH CLAY (FILL)
			4	CL	GREEN GREY, SLIGHTLY MOIST, FIRM, SANDY CLAY
			5	CL	TRENCH TERMINATED AT 4 FEET
			6		
			7		
			8		
			9		
			10		

HOLDREGE & KULL

TRENCH 26

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977–01	BEAR RIVER MILL SITE	2384 FEET MSL	8/6/99	1 OF 1	26

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	NONE	NONE	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			0	ML	DARK RED BROWN, DRY TO SLIGHTLY MOIST, MEDIUM DENSE, CLAYEY SILT
			3	CL	YELLOW BROWN MOTTLED WITH LIGHT GREY, MOIST, MEDIUM, SANDY CLAY
			5		TRENCH TERMINATED AT 5 FEET

HOLDREGE & KULL

TRENCH 27

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977–01	BEAR RIVER MILL SITE	2404 FEET MSL	8/5/99	1 OF 1	27

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	SLIDE HAMMER	NONE	1 – 8 FEET

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
				OL	DARK BROWN, DRY, LOOSE, SILTY SAND WITH ORGANICS AND COMMON ROOTS (FILL)
			1	GP	ANGULAR ROCK TO 12 INCH DIAMETER WITH DARK BROWN, DRY, LOOSE, TO MEDIUM DENSE, SANDY SILT (FILL)
			2		
			3		
			4		
			5		
			6		
			7		
			8	CL	YELLOW BROWN MOTTLED WITH ORANGE BROWN, DAMP, SOFT, SANDY CLAY (NATIVE)
			9		TRENCH TERMINATED AT 9 FEET
			10		

HOLDREGE & KULL

TRENCH 28

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977–01	BEAR RIVER MILL SITE	2398 FEET MSL	2396	1 OF 1	28

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	SLIDE HAMMER	NONE	0 – 5 FEET

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			0	GP	ANGULAR ROCK TO 18 INCHES IN DIAMETER WITH MINOR DARK BROWN SILTY SAND AND MINOR DEBRIS (SELECTIVE BORROW REQUIRED FROM STOCKPILE)
			5		TRENCH TERMINATED AT 5 FEET NEAR BOTTOM OF STOCKPILE

HOLDREGE & KULL

TRENCH 29

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977–01	BEAR RIVER MILL SITE	2398 FEET MSL	8/6/99	1 OF 1	29

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	NONE	NONE	0 – 3 FEET

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			1	GP	ANGULAR ROCK TO 18 INCHES IN DIAMETER WITH MINOR DARK BROWN SILTY SAND AND MINOR DEBRIS (SELECTIVE BORROW REQUIRED FROM STOCKPILE)
			2		
			3		TRENCH TERMINATED AT 3 FEET WITHIN STOCKPILE
			4		
			5		
			6		
			7		
			8		
			9		
			10		

HOLDREGE & KULL

TRENCH 30

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977-01	BEAR RIVER MILL SITE	2388 FEET MSL	8/6/99	1 OF 1	30

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	NONE	NONE	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			1	PT	PEAT, WOOD DEBRIS (FILL)
			2	CL	YELLOW BROWN, SLIGHTLY MOIST, MEDIUM, SANDY CLAY
			3	SC	ORANGE BROWN TO YELLOW BROWN, MOIST, MEDIUM DENSE, CLAYEY SAND (NATIVE)
			4		TRENCH TERMINATED AT 3 FEET
			5		
			6		
			7		
			8		
			9		
			10		

HOLDREGE & KULL

TRENCH 31

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977–01	BEAR RIVER MILL SITE	2398 FEET MSL	8/6/99	1 OF 1	31

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	NONE	NONE	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			1	ML	DARK BROWN, DRY, MEDIUM DENSE, CLAYEY SILT
			2	ML	COMPLETELY WEATHERED ROCK (EXCAVATES AS ORANGE BROWN, SLIGHTLY MOIST, MEDIUM DENSE, CLAYEY SILT)
			3		
			4		TRENCH TERMINATED AT 4 FEET
			5		
			6		
			7		
			8		
			9		
			10		

HOLDREGE & KULL

TRENCH 32

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977-01	BEAR RIVER MILL SITE	2401 FEET MSL	8/6/99	1 OF 1	32

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	NONE	NONE	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			0	PT	PEAT, DEBRIS (WOOD, PLASTIC, METAL, CONCRETE)
			2	SC	ORANGE BROWN, SLIGHTLY MOIST, MEDIUM DENSE, CLAYEY SAND (NATIVE)
			4		TRENCH TERMINATED AT 4 FEET

HOLDREGE & KULL

TRENCH 33

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977–01	BEAR RIVER MILL SITE	2394 FEET MSL	8/6/99	1 OF 1	33

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
CASE 580B EXTENDAHOE	NONE	NONE	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			1	SC	ORANGE BROWN, DRY TO SLIGHTLY MOIST, MEDIUM DENSE, CLAYEY SAND (FILL)
			2	SC	ORANGE BROWN, SLIGHTLY MOIST, MEDIUM DENSE, CLAYEY SAND (NATIVE)
			3		TRENCH TERMINATED AT 3 FEET
			4		
			5		
			6		
			7		
			8		
			9		
			10		

HOLDREGE & KULL

TRENCH 34

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977-02	BEAR RIVER MILL SITE	2398 FEET MSL	9/12/01	1 OF 1	34

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
KOMATSU PC300LC EXCAVATOR	NONE	NONE	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			1	ML	RED BROWN, DRY, LOOSE TO MEDIUM DENSE, CLAYEY SILT (FILL)
			2		COMPLETELY WEATHERED GRANODIORITE ROCK (EXCAVATES AS ORANGE BROWN, SLIGHTLY MOIST, MEDIUM DENSE SANDY SILT WITH VARIABLE MINOR CLAY CONTENT)
			3		
			4		
			5		
			6		
			7		
			8		
			9		
			10	ML	OCCASIONAL RESISTANT ROCK TO 24" DIAMETER
			11		
			12		
			13		
			14		
			15		
			16		
			17		
			18		
			19		TRENCH TERMINATED AT 19 FEET
			20		

HOLDREGE & KULL

TRENCH 35

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977-02	BEAR RIVER MILL SITE	2398 FEET MSL	9/12/01	1 OF 1	35

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
KOMATSU PC300LC EXCAVATOR	NONE	NONE	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			1	ML	COMPLETELY WEATHERED GRANODIORITE ROCK (EXCAVATES AS ORANGE BROWN, DRY TO SLIGHTLY MOIST, MEDIUM DENSE SANDY SILT WITH CLAY)
			2		
			3		SHALLOW, RESISTANT, SLIGHTLY WEATHERED ROCK AT 3 FEET BGS IN PORTIONS OF TRENCH ALIGNMENT
			4		
			5		DENSITY AND ROCK STRUCTURE INCREASES AT 5 FEET BGS, DENSE SOIL WITH MODERATELY TO SLIGHTLY WEATHERED FRACTURED ROCK; DIFFICULT DIGGING
			6		
			7		
			8		
			9		
			10		TRENCH TERMINATED AT 10 FEET
			11		
			12		
			13		
			14		
			15		
			16		
			17		
			18		
			19		
			20		

HOLDREGE & KULL

TRENCH 36

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977-02	BEAR RIVER MILL SITE	2393 FEET MSL	9/12/01	1 OF 1	36

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
KOMATSU PC300LC EXCAVATOR	NONE	NONE	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
				PT	PEAT FILL, UPPER 6 INCHES
			1		COMPLETELY WEATHERED GRANODIORITE ROCK (EXCAVATES AS ORANGE BROWN, SLIGHTLY MOIST, MEDIUM DENSE SANDY SILT WITH VARIABLE CLAY CONTENT)
			2		
			3		
			4		
			5		OCCASIONAL ISOLATED RESISTANT ROCK
			6		
			7		
			8		
			9		
			10	ML	
			11		
			12		
			13		
			14		
			15		DENSITY AND RESISTANCE INCREASES WITH DEPTH
			16		
			17		TRENCH TERMINATED AT 17 FEET
			18		
			19		
			20		

HOLDREGE & KULL

TRENCH 37

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977-02	BEAR RIVER MILL SITE	2402 FEET MSL	9/12/01	1 OF 1	37

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
KOMATSU PC300LC EXCAVATOR	HAND	NONE	0 - 6 FEET

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			1	ML	ANGULAR, GRANODIORITE ROCK TO 12" DIAMETER WITH DARK BROWN, DRY TO SLIGHTLY MOIST, SANDY SILT (FILL)
			2		
			3		
			4		
PB 37-1			5		
PB 37-2			6		
			7	CL	YELLOW BROWN TO GRAY, LOOSE, MOIST TO DAMP, SANDY CLAY (COMPLETELY WEATHERED ROCK); PETROLEUM ODOR
			8		
			9		
PB 37-3			10		
			11		
			12		
			13		
			14		
			15		
			16		
			17		
			18		TRENCH TERMINATED AT 18 FEET
			19		
			20		

HOLDREGE & KULL

TRENCH 38

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977-02	BEAR RIVER MILL SITE	2411 FEET MSL	9/12/01	1 OF 1	38

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
KOMATSU PC300LC EXCAVATOR	HAND	NONE	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			0	ML	COMPLETELY TO SEVERELY WEATHERED GRANODIORITE ROCK (EXCAVATES AS LIGHT BROWN, SANDY SILT WITH VARIABLE MINOR CLAY)
			1		
			2		
			3		
			4		
			5		
			6		
			7		
			8		
			9		
			10		
			11		
			12		
			13		
			14		
			15		INCREASING DENSITY AND RESISTANCE AT 15 FEET
			16		
			17		
			18		
			19		TRENCH TERMINATED AT 19 FEET
			20		

HOLDREGE & KULL

TRENCH 39

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977-02	BEAR RIVER MILL SITE	2406 FEET MSL	9/12/01	1 OF 1	39

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
KOMATSU PC300LC EXCAVATOR	NONE	NONE	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			0	ML	COMPLETELY WEATHERED GRANODIORITE ROCK (EXCAVATES AS LIGHT BROWN, DRY TO SLIGHTLY MOIST, MEDIUM DENSE, SANDY SILT WITH MINOR CLAY)
			12	SM	LIGHT BROWN, MOIST, MEDIUM DENSE, SILTY SAND
			17		TRENCH TERMINATED AT 17 FEET

HOLDREGE & KULL

TRENCH 40

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977-02	BEAR RIVER MILL SITE	2407 FEET MSL	9/12/01	1 OF 1	40

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
KOMATSU PC300LC EXCAVATOR	NONE	17 FEET	9 - 20 FEET

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			0	ML	LIGHT BROWN, DRY TO SLIGHTLY MOIST, LOOSE TO MEDIUM DENSE, SANDY SILT WITH GRAVEL (FILL)
			3	ML	COMPLETELY TO SEVERELY WEATHERED GRANODIORITE ROCK (EXCAVATES AS LIGHT BROWN, SLIGHTLY MOIST, MEDIUM DENSE SANDY SILT WITH MINOR CLAY AND ISOLATED RESISTANT ROCK) SECONDARY CAVING 9 FEET TO APPROXIMATELY 17 FEET
			16	SC	APPARENT NORTH BEARING MINE ADIT AT 16 TO 20 FEET BGS, 4-FOOT DIAMETER, IN NORTH WALL AT EAST END OF TRENCH. LIGHT BROWN TO LIGHT GRAY, DAMP TO SATURATED, LOOSE, CLAYEY SAND ENCOUNTERED IN ADIT, SEEPAGE AT 17 FEET BGS
			20		TRENCH TERMINATED AT 20 FEET

HOLDREGE & KULL

TRENCH 41

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977-02	BEAR RIVER MILL SITE	2398 FEET MSL	9/12/01	1 OF 1	41

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
KOMATSU PC300LC EXCAVATOR	NONE	13 FEET	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			1–7	ML	DARK BROWN TO MEDIUM BROWN, SLIGHTLY MOIST TO MOIST, LOOSE TO MEDIUM DENSE SANDY SILT WITH GRAVEL AND COBBLES (FILL)
			7–14	SM – ML	COMPLETELY WEATHERED GRANODIORITE ROCK (EXCAVATES AS LIGHT BROWN, MOIST, MEDIUM DENSE SILTY SAND AND SANDY SILT WITH CLAY) GROUNDWATER ENCOUNTERED AT 13 FEET BGS
			14		TRENCH TERMINATED AT 14 FEET

HOLDREGE & KULL

TRENCH 42

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977-02	BEAR RIVER MILL SITE	2390 FEET MSL	9/12/01	1 OF 1	42

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
KOMATSU PC300LC EXCAVATOR	HAND	NONE	0 – 3 FEET

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
PB 42-1			0 – 3	PT	PEAT WITH ANGULAR ROCK (FILL)
			3 – 11	ML	COMPLETELY WEATHERED GRANODIORITE ROCK (EXCAVATES AS YELLOW BROWN TO GRAY, MOIST, LOOSE TO MEDIUM DENSE CLAYEY SILT)
			11		TRENCH TERMINATED AT 11 FEET

HOLDREGE & KULL

TRENCH 43

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977-02	BEAR RIVER MILL SITE	2398 FEET MSL	9/12/01	1 OF 1	43

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
KOMATSU PC300LC EXCAVATOR	HAND	NONE	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
PB 43-1			0-3	SM	ANGULAR ROCK TO 12" DIAMETER WITH DARK BROWN, DRY TO SLIGHTLY MOIST, LOOSE TO MEDIUM DENSE SILTY SAND
			3-11	SC	YELLOW BROWN TO GRAY, MOIST, SOFT, CLAYEY SAND
			11-13	SC	YELLOW BROWN, MOIST, MEDIUM, SANDY CLAY
			13		TRENCH TERMINATED AT 13 FEET

HOLDREGE & KULL

TRENCH 44

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977-02	BEAR RIVER MILL SITE	2381 FEET MSL	9/12/01	1 OF 1	44

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
KOMATSU PC300LC EXCAVATOR	NONE	NONE	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
				PT	PEAT, UPPER 6 INCHES
			1	ML	RED BROWN, DRY TO SLIGHTLY MOIST, MEDIUM DENSE CLAYEY SILT
			2		
			3		
			4		
			5		
			6		
			7		
			8		
			9		
			10		
			11		
			12		
			13		
			14		TRENCH TERMINATED AT 14 FEET
			15		
			16		
			17		
			18		
			19		
			20		

HOLDREGE & KULL

TRENCH 45

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977-02	BEAR RIVER MILL SITE	2416 FEET MSL	9/12/01	1 OF 1	45

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
KOMATSU PC300LC EXCAVATOR	HAND	NONE	0 – 10 FEET

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
PB 45-1			0 – 4	ML	DARK BROWN, DRY TO SLIGHTLY MOIST, LOOSE TO MEDIUM DENSE, SANDY SILT WITH ABUNDANT ANGULAR ROCK TO 12" DIAMETER AND MINOR ORGANIC DEBRIS (FILL)
			4 – 10	SM	DARK BROWN, SLIGHTLY MOIST, LOOSE, SILTY SAND WITH ABUNDANT ORGANIC DEBRIS (FILL PEAT)
			10 – 16	ML	COMPLETELY WEATHERED GRANODIORITE ROCK (EXCAVATES AS BLUE GRAY, MOIST, SOFT TO MEDIUM, CLAYEY SILT)
			16		TRENCH TERMINATED AT 16 FEET

HOLDREGE & KULL

TRENCH 46

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977-02	BEAR RIVER MILL SITE	2414 FEET MSL	9/12/01	1 OF 1	46

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
KOMATSU PC300LC EXCAVATOR	HAND	NONE	0 – 8 FEET

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			0	ML	ANGULAR ROCK TO 12" DIAMETER WITH DARK BROWN, DRY TO SLIGHTLY MOIST, LOOSE TO MEDIUM DENSE, SANDY SILT
			1		
			2		
			3		STEEL AND PLASTIC PIPE ENCOUNTERED IN TRENCH
			4		
			5		
PB 46-1			6		CONCRETE SLAB ON GRADE (POSSIBLY 12" THICK, RESISTANT)
			7		
			8	ML	COMPLETELY WEATHERED GRANODIORITE ROCK (EXCAVATES AS BLUE GRAY, MOIST, SOFT TO MEDIUM, CLAYEY SILT)
			9		
			10		TRENCH TERMINATED AT 10 FEET
			11		
			12		
			13		
			14		
			15		
			16		
			17		
			18		
			19		
			20		

HOLDREGE & KULL

TRENCH 47

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977-02	BEAR RIVER MILL SITE	2418 FEET MSL	9/13/01	1 OF 1	47

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
KOMATSU PC300LC EXCAVATOR	NONE	NONE	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			2	ML	COMPLETELY WEATHERED GRANODIORITE ROCK (EXCAVATES AS ORANGE BROWN, SLIGHTLY MOIST TO MOIST, MEDIUM DENSE, SANDY SILT WITH CLAY
			4		
			6		
			8		
			10		
			12		
			14		
			16		
			18		
			20		
			22		
			24		TRENCH TERMINATED AT 23 FEET
			26		
			28		
			30		
			32		
			34		
			36		
			38		
			40		

HOLDREGE & KULL

TRENCH 48

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977-02	BEAR RIVER MILL SITE	2403 FEET MSL	9/13/01	1 OF 1	48

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
KOMATSU PC300LC EXCAVATOR	HAND	NONE	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			1	SM	MEDIUM BROWN, SLIGHTLY MOIST, MEDIUM DENSE, SILTY SAND
			2	ML	DARK BROWN, SLIGHTLY MOIST, MEDIUM DENSE, SANDY SILT
			3	CL	COMPLETELY WEATHERED GRANODIORITE ROCK (EXCAVATES AS BLUE GRAY, MOIST, MEDIUM, SILTY CLAY)
PB 48-1			5		
			10	SM	COMPLETELY WEATHERED GRANODIORITE ROCK (EXCAVATES AS LIGHT BROWN, MOIST, MEDIUM DENSE, SILTY SAND)
			14		TRENCH TERMINATED AT 14 FEET

HOLDREGE & KULL

TRENCH 49

PROJECT NO.	PROJECT NAME	ELEVATION	DATE	PAGE	FIGURE NO.
977-02	BEAR RIVER MILL SITE	2442 FEET MSL	9/13/01	1 OF 1	49

EXCAVATING METHOD	SAMPLING METHOD	GROUNDWATER ENCOUNTERED	CAVED
KOMATSU PC300LC EXCAVATOR	NONE	NONE	NONE

SAMPLE NO.	DRY DENSITY (PCF)	PERCENT MOISTURE	DEPTH (FT)	USCS	DESCRIPTIONS/REMARKS
			0	ML	DARK BROWN, SLIGHTLY MOIST, LOOSE TO MEDIUM DENSE, SANDY SILT WITH ANGULAR ROCK TO 6" DIAMETER (FILL)
			4	ML – SM	COMPLETELY WEATHERED GRANODIORITE ROCK (EXCAVATES AS LIGHT BROWN, SLIGHTLY MOIST, MEDIUM DENSE, SANDY SILT TO SILTY SAND WITH VARIABLE MINOR CLAY CONTENT)
					INCREASING SAND CONTENT
			18		TRENCH TERMINATED AT 18 FEET

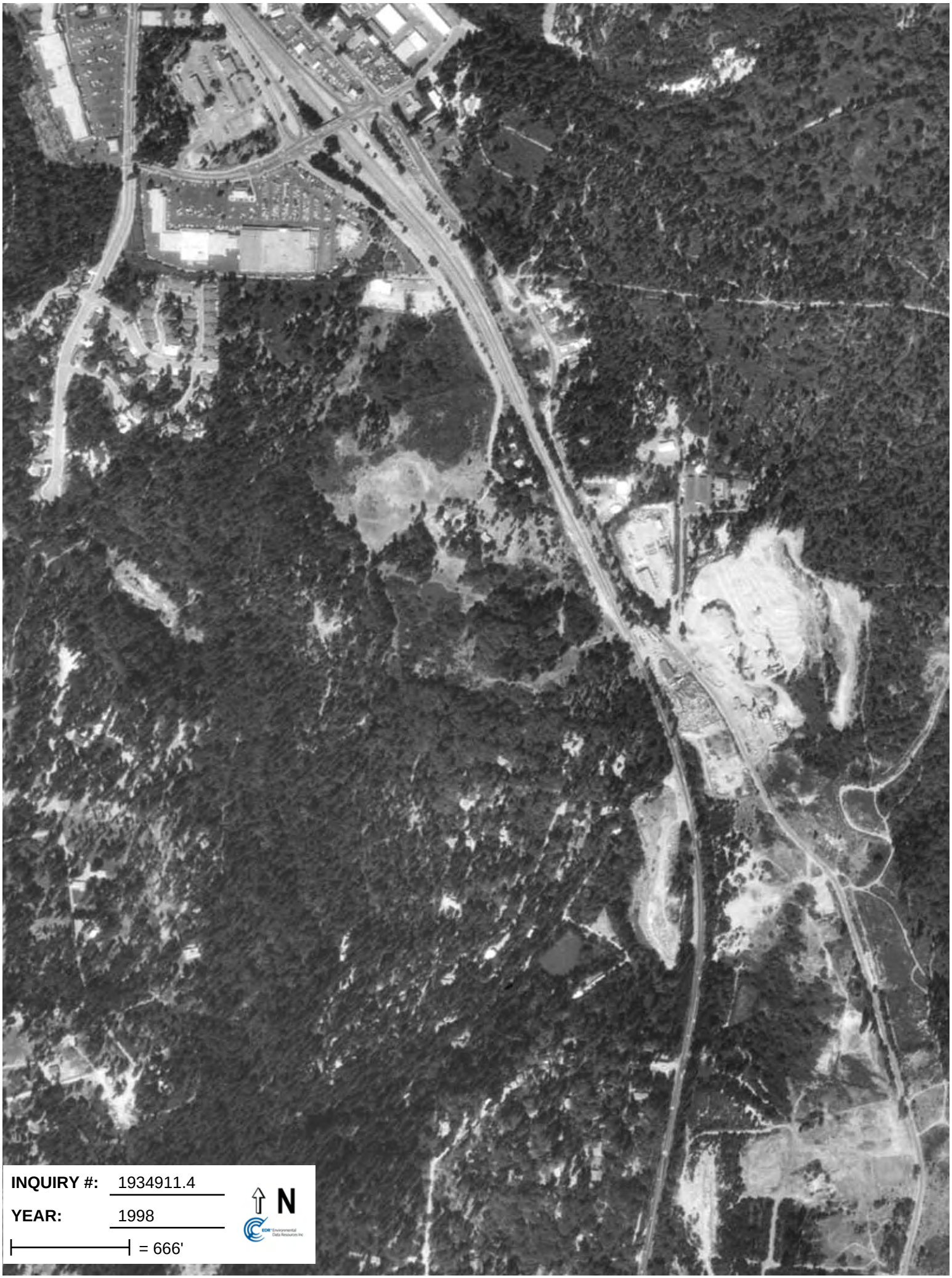
HOLDREGE & KULL

APPENDIX B AERIAL PHOTOGRAPHS


INQUIRY #: 1934911.4
YEAR: 1952
= 555'
N


INQUIRY #: 1934911.4
YEAR: 1962
= 555'
N


INQUIRY #: 1934911.4
YEAR: 1987
= 666'
N


INQUIRY #: 1934911.4
YEAR: 1998
= 666'
N

APPENDIX C PHOTOGRAPHS

Photo 1. Dense manzanita near southern site boundary.

Photo 2. Stockpiles near exploratory trench location 1 viewed from the southwest.

Photo 3. Former Bear River Saw Mill location viewed from the east.

Photo 4. Former Bear River Saw Mill location viewed from the west.

Photo 5. Former Valley Veneer Plant location viewed from the southwest.

Photo 6. Former Valley Veneer Plant location viewed from the east.

Photo 7. Former Pond 1 (dry).

Photo 8. Pond 2 (dry).

Photo 9. Pond 2 outlet structure.

Photo 10. Pond 3.