Project No. S9534-05-02A
January 11, 2021
Revised February 16, 2021

VIA ELECTRONIC MAIL

Jason Smith
A. Teichert & Son, Inc.
Aggregate Resource Development
3500 American River Drive
Sacramento, California 95864-5805

Subject: ADDITIONAL GEOTECHNICAL EVALUATION
SCHWARZGRUBER MINING AND RECLAMATION PROJECT UPDATE
YOLO COUNTY, CALIFORNIA

Mr. Smith:

In accordance with your authorization of our proposal (Geocon Proposal No. S9534-05-02AP, dated December 3, 2020), we have performed additional geotechnical evaluation for the subject project. The project consists of aggregate mining and reclamation at the Schwarzgruber Property located on the west side of County Road 94 on the south side of Cache Creek in Yolo County, California. The approximate site location is depicted on the Vicinity Map, Figure 1.

BACKGROUND AND PURPOSE

In 2011 and 2012 Geocon performed geotechnical services related to the proposed Schwarzgruber Mining and Reclamation site (*Schwarzgruber Mining and Reclamation Project, County Road 96, Yolo County, California, Slope Stability Evaluation*, dated May 11, 2011 and *Response to OMR Comments, Schwarzgruber Mining and Reclamation Project, California Mine ID #91-57-006, Yolo County File #2011-0035, Yolo County, California*, dated October 8, 2012). Our services included reviewing existing subsurface information (drill hole logs) prepared by and provided by Teichert, performing eight test pits and three exploratory borings, and performing laboratory testing. We evaluated slope stability for proposed mining and reclamation slopes for the current permitted mining activities. Our evaluation concluded that the proposed mining and reclamation slopes would be globally stable under static and seismic conditions. For details on site geology, soil conditions, mining and reclamation activities at the site, and our slope stability analysis, please review the referenced report and letter.

Aggregate mining activities are currently limited to the area at least 700 feet away from the 100-year flood limits of Cache Creek. We understand that Teichert is considering performing reclamation enhancement within this 700-foot setback area to within 200 feet of the 100-year flood limit. Reclamation enhancement will consist of excavations and backfill in targeted areas.

Our previous investigative activities were generally limited to the current mining areas and did not include geotechnical borings within the current 700-foot setback area. Currently proposed excavations and reclamation activities, as shown in the *Conceptual Off-Channel Reclamation Plan for Schwarzgruber Property, Yolo County, January 2021*, by Cunningham Engineering, dated January 11, 2021) will conform to those generally described in our referenced report (slope configurations, fill placement, etc.). Maximum slope heights for reclamation enhancement are indicated to be on the order of 30 feet or less in height, significantly lower than previous excavation slopes constructed for mining and reclamation activities at this site.

The purpose of our geotechnical services was to evaluate and confirm subsurface conditions within the expanded reclamation enhancement area and confirm adequate slope stability for the perimeter slopes under static and dynamic (seismic) conditions with respect to the performance standards outlined in the Yolo County Off-Channel Surface Mining and Reclamation Ordinances, and the California Surface Mining and Reclamation Act (SMARA).

SCOPE OF SERVICES

To prepare this report, we performed the following scope of services:

- Performed a review of published geologic maps and other literature pertaining to the site.
- Reviewed our referenced report and letter for the project site.
- Reviewed preliminary site plans to select exploratory excavation locations.
- Performed a site reconnaissance to review project limits, determine access and mark out exploratory excavation locations for subsequent utility clearance.
- Paid required fees and obtain a soil boring permit from Yolo County Environmental Health Department (YCEHD).
- Notified subscribing utility companies via Underground Service Alert (USA) a minimum of two business days prior to performing exploratory excavations at the site.
- Retained the services of California C57-licensed drilling subcontractor to perform exploratory borings using truck-mounted drilling equipment.
- Performed two exploratory borings (2020-B1 and 2020-B2) within targeted areas of the site using a hollow-stem auger drill rig to depths of approximately 41½ and 61½ feet. Boring locations are shown on the Site Plan, Figure 2. A Key to Logs is presented as Figure 3 and boring logs are presented as Figures 4 through 8.
- Obtained representative disturbed and undisturbed soil samples of the encountered soil materials from the borings.
- Logged the borings in accordance with the Unified Soil Classification System (USCS).
- Upon completion, backfilled the borings in accordance with YCEHD permit requirements.
- Performed laboratory tests on selected soil samples to evaluate pertinent geotechnical parameters. Laboratory test results are presented on Figures 9 through 11.
- Prepared this letter summarizing our findings and conclusions

SOIL CONDITIONS

Soil Conditions

Approximately 7 feet of fill consisting of clayey sand with gravel (SC) was encountered in Boring 2020-B2. The soil below the fill (and encountered from the ground surface in Boring 2020-B1) generally consists of dense to very dense poorly graded gravel with varying amounts of sand and clay (GP-GC, GP) extending to depths of approximately 27 to 50 feet below site grade. While not directly observed, we anticipate that at least scattered cobbles are likely present in these materials based on our experience at this site. This strata overlays medium stiff to hard clay encountered to the maximum depths explored in our two borings.

We encountered groundwater in both of our exploratory borings performed on December 12, 2020 (B1 and B2) at elevations of approximately 44 and 37 feet, respectively. The noted groundwater elevations were measured during drilling activities and may not reflect stabilized groundwater elevations at these boring locations. It should be noted that fluctuations in the level of groundwater may occur due to variations in rainfall, temperature, and other factors. Depth to groundwater can also vary significantly due to localized land use, pumping, irrigation practices, and seasonal fluctuations in Cache Creek.

Soil conditions described in the previous paragraphs are generalized. We advise the reader to consult the exploratory boring logs (Figures 4 through 8). Logs include soil type, color, moisture, consistency, and USCS classification of the materials encountered at specific locations and elevations.

Laboratory Test Results

Laboratory tests were performed in accordance with generally accepted test methods of the American Society for Testing and Materials (ASTM) or other suggested procedures. Selected soil samples were tested for their in-situ density and moisture content, grain size distribution, and plasticity characteristics. Laboratory test results are presented on Figures 9 through 12.

DISCUSSION AND CONCLUSIONS

Based on the results of our additional field investigation within the area of proposed reclamation enhancement, the subsurface conditions are considered substantially similar in composition and nature as those previously encountered and modeled for the existing mining area. We did not encounter any significant overburden materials, which were the weakest materials modeled in our previous slope stability analyses.

Our previous slope stability analyses results are summarized in the referenced report (Geocon 2011) and letter (Geocon, 2012). These slopes were between 45 and 75 feet high. Proposed slopes for the reclamation enhancement will be less than 45 feet high with similar slope configurations as the existing mining activities.

Given the above, the proposed reclamation enhancement slopes are anticipated to meet the performance standards set forth in the Yolo County Surface Mining and Reclamation Ordinances and SMARA. The general conclusions and recommendations of our previous report and letter apply to the currently proposed reclamation activities. Given the low potential for slope instability for activities within the area of proposed reclamation enhancement, we do not expect that these activities within the 700 foot setback area will adversely affect the stability of the existing levee/bank such that the potential for pit capture increases.

REFERENCES

1. Cunningham Engineering, *Conceptual Off-Channel Reclamation Plan for Schwarzgruber Property, Yolo County, January 2021*, dated January 11, 2021.
2. Geocon Consultants, Inc., *Schwarzgruber Mining and Reclamation Project, County Road 96, Yolo County, California, Slope Stability Evaluation*, dated May 11, 2011.
3. Geocon Consultants, Inc., *Response to OMR Comments, Schwarzgruber Mining and Reclamation Project, California Mine ID #91-57-006, Yolo County File #2011-0035, Yolo County, California*, dated October 8, 2012.
4. Unpublished reports, aerial photographs, and maps on file with Geocon.

LIMITATIONS

The recommendations of this report pertain only to the site investigated and are based upon the assumption that the soil conditions do not deviate from those disclosed in the investigation. If any variations or undesirable conditions are encountered during mining and reclamation, or if the proposed mining and reclamation will differ from that anticipated herein, we should be notified so that supplemental recommendations can be given. The evaluation or identification of the potential presence of hazardous materials or environmental contamination was not part of our scope of services.

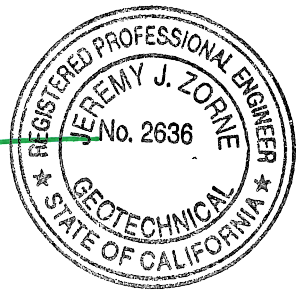
Our professional services were performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering and engineering geology principles and practices used in the site area at this time. No warranty is provided, express or implied. This report is subject to review and should not be relied upon after a period of three years.

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

Respectfully Submitted,

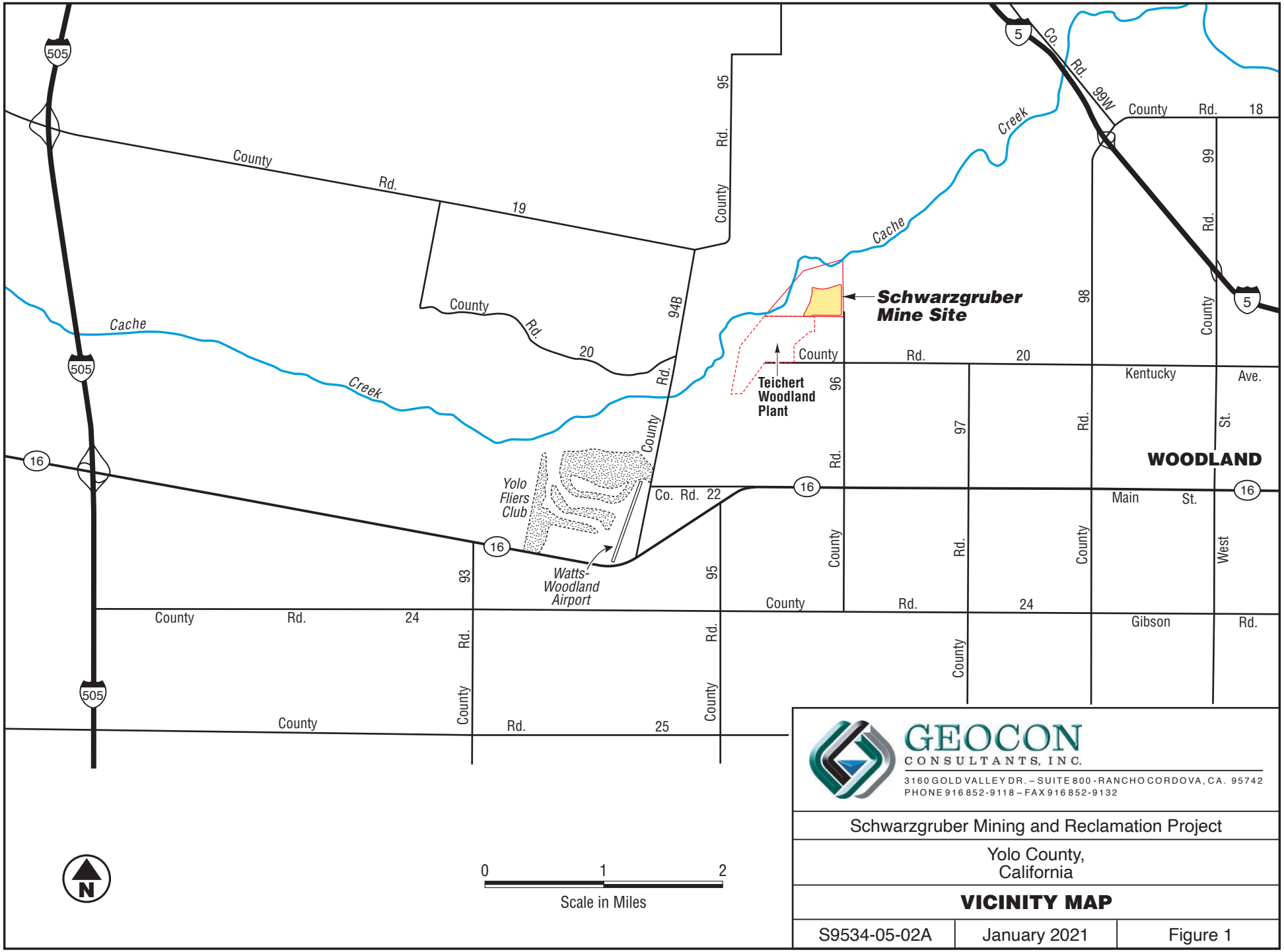
GEOCON CONSULTANTS, INC.

Ronald E. Loutzenhiser, PE, GE
Senior Engineer



Jeremy J. Zorne, PE, GE
Senior Engineer

Attachments: Figure 1, Vicinity Map
Figure 2, Site Plan
Figure 3, Key to Logs
Figures 4 through 8, Logs of Borings 2020-B1 and 2020-B2
Figure 9, Summary of Laboratory Results
Figure 10, Atterberg Limits
Figures 11 and 12, Grain Size Distribution



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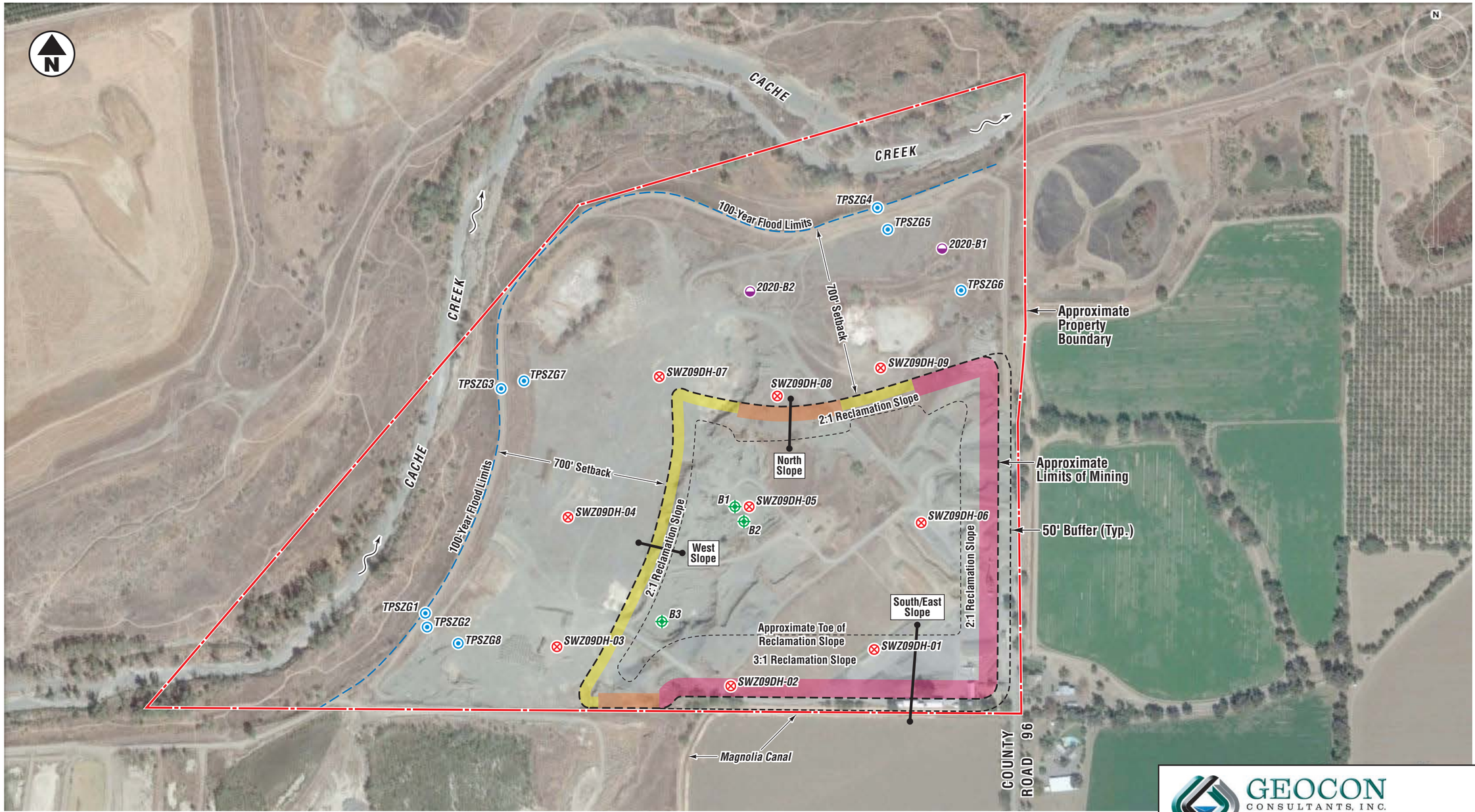
Schwarzgruber Mining and Reclamation Project

Yolo County, California

VICINITY MAP

S9534-05-02A	January 2021	Figure 1



Aerial Photo: Google Earth, 9/24/09

LEGEND:

- SWZ09DH-01 — Approximate Drillhole Location (Teichert, 2009)
- TPSZG1 — Approximate Test Pit Location (Geocon, 2010)
- B3 — Approximate Exploratory Boring Location (Geocon, 2011)
- 2020-B2 — Approximate Boring Location (Geocon, 2020)
- West Slope — Stability Analysis Cross-Section (Figure 3)
- 45± High Mining Slope
- 60± High Mining Slope
- 75± High Mining Slope

0 400
Scale in Feet

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SITE PLAN

S9534-05-02A	January 2021	Figure 2

UNIFIED SOIL CLASSIFICATION

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

BORING/TRENCH LOG LEGEND

- No Recovery
- Shelby Tube Sample 3" O.D.
- Bulk Sample
- SPT Sample 2" O.D., 1.4" I.D.
- Modified California Sample 3" O.D., 2.4" I.D.
- Groundwater Level (At Completion)
- Groundwater Level (Seepage)

PENETRATION RESISTANCE

SAND AND GRAVEL			SILT AND CLAY			
RELATIVE DENSITY	BLOWS PER FOOT (SPT)*	BLOWS PER FOOT (MOD-CAL)*	CONSISTENCY	BLOWS PER FOOT (SPT)*	BLOWS PER FOOT (MOD-CAL)*	COMPRESSIVE STRENGTH (tsf)
VERY LOOSE	0 - 4	0 - 6	VERY SOFT	0 - 2	0 - 3	0 - 0.25
LOOSE	5 - 10	7 - 16	SOFT	3 - 4	4 - 6	0.25 - 0.50
MEDIUM DENSE	11 - 30	17 - 48	MEDIUM STIFF	5 - 8	7 - 13	0.50 - 1.0
DENSE	31 - 50	49 - 79	STIFF	9 - 15	14 - 24	1.0 - 2.0
VERY DENSE	OVER 50	OVER 79	VERY STIFF	16 - 30	25 - 48	2.0 - 4.0
			HARD	OVER 30	OVER 48	OVER 4.0

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

MOISTURE DESCRIPTIONS

FIELD TEST	APPROX. DEGREE OF SATURATION, S (%)	DESCRIPTION
NO INDICATION OF MOISTURE; DRY TO THE TOUCH	S<25	DRY
SLIGHT INDICATION OF MOISTURE	25≤S<50	DAMP
INDICATION OF MOISTURE; NO VISIBLE WATER	50≤S<75	MOIST
MINOR VISIBLE FREE WATER	75≤S<100	WET
VISIBLE FREE WATER	100	SATURATED

QUANTITY DESCRIPTIONS

APPROX. ESTIMATED PERCENT	DESCRIPTION
<5%	TRACE
5 - 10%	FEW
11 - 25%	LITTLE
26 - 50%	SOME
>50%	MOSTLY

GRAVEL/COBBLE/BOULDER DESCRIPTIONS

CRITERIA	DESCRIPTION
PASS THROUGH A 3-INCH SIEVE AND BE RETAINED ON A NO. 4 SIEVE (#4 TO 3")	GRAVEL
PASS A 12-INCH SQUARE OPENING AND BE RETAINED ON A 3-INCH SIEVE (3"-12")	COBBLE
WILL NOT PASS A 12-INCH SQUARE OPENING (>12")	BOULDER

LABORATORY TEST KEY

CP – COMPACTION CURVE (ASTM D1557)
CR – CORROSION ANALYSIS (CTM 422, 643, 417)
DS – DIRECT SHEAR (ASTM D3080)
EI – EXPANSION INDEX (ASTM D4829)
GSA – GRAIN SIZE ANALYSIS (ASTM D422)
MC – MOISTURE CONTENT (ASTM D2216)
PI – PLASTICITY INDEX (ASTM D4318)
R – R-VALUE (CTM 301)
SE – SAND EQUIVALENT (CTM 217)
TXCU – CONSOLIDATED UNDRAINED TRIAXIAL (ASTM D4767)
TXUU – UNCONSOLIDATED UNDRAINED TRIAXIAL (ASTM D2850)
UC – UNCONFINED COMPRESSIVE STRENGTH (ASTM D2166)

BEDDING SPACING DESCRIPTIONS

THICKNESS/SPACING	DESCRIPTOR
GREATER THAN 10 FEET	MASSIVE
3 TO 10 FEET	VERY THICKLY BEDDED
1 TO 3 FEET	THICKLY BEDDED
3 ⅝-INCH TO 1 FOOT	MODERATELY BEDDED
1 ⅛-INCH TO 3 ⅝-INCH	THINLY BEDDED
⅜-INCH TO 1 ⅛-INCH	VERY THINLY BEDDED
LESS THAN ⅜-INCH	LAMINATED

STRUCTURE DESCRIPTIONS

CRITERIA	DESCRIPTION
ALTERNATING LAYERS OF VARYING MATERIAL OR COLOR WITH LAYERS AT LEAST ¼-INCH THICK	STRATIFIED
ALTERNATING LAYERS OF VARYING MATERIAL OR COLOR WITH LAYERS LESS THAN ¼-INCH THICK	LAMINATED
BREAKS ALONG DEFINITE PLANES OF FRACTURE WITH LITTLE RESISTANCE TO FRACTURING	FISSURED
FRACTURE PLANES APPEAR POLISHED OR GLOSSY, SOMETIMES STRIATED	SLICKENSIDED
COHESIVE SOIL THAT CAN BE BROKEN DOWN INTO SMALLER ANGULAR LUMPS WHICH RESIST FURTHER BREAKDOWN	BLOCKY
INCLUSION OF SMALL POCKETS OF DIFFERENT SOIL, SUCH AS SMALL LENSES OF SAND SCATTERED THROUGH A MASS OF CLAY	LENSED
SAME COLOR AND MATERIAL THROUGHOUT	HOMOGENOUS

CEMENTATION/INDURATION DESCRIPTIONS

FIELD TEST	DESCRIPTION
CRUMBLES OR BREAKS WITH HANDLING OR LITTLE FINGER PRESSURE	WEAKLY CEMENTED/INDURATED
CRUMBLES OR BREAKS WITH CONSIDERABLE FINGER PRESSURE	MODERATELY CEMENTED/INDURATED
WILL NOT CRUMBLE OR BREAK WITH FINGER PRESSURE	STRONGLY CEMENTED/INDURATED

IGNEOUS/METAMORPHIC ROCK STRENGTH DESCRIPTIONS

FIELD TEST	DESCRIPTION
MATERIAL CRUMBLES WITH BARE HAND	WEAK
MATERIAL CRUMBLES UNDER BLOWS FROM GEOLOGY HAMMER	MODERATELY WEAK
¼-INCH INDENTATIONS WITH SHARP END FROM GEOLOGY HAMMER	MODERATELY STRONG
HAND-HELD SPECIMEN CAN BE BROKEN WITH **ONE** BLOW FROM GEOLOGY HAMMER	STRONG
HAND-HELD SPECIMEN CAN BE BROKEN WITH **COUPLE** BLOWS FROM GEOLOGY HAMMER	VERY STRONG
HAND-HELD SPECIMEN CAN BE BROKEN WITH **MANY** BLOWS FROM GEOLOGY HAMMER	EXTREMELY STRONG

IGNEOUS/METAMORPHIC ROCK WEATHERING DESCRIPTIONS

DEGREE OF DECOMPOSITION	FIELD RECOGNITION	ENGINEERING PROPERTIES
SOIL	DISCOLORED, CHANGED TO SOIL, FABRIC DESTROYED	EASY TO DIG
COMPLETELY WEATHERED	DISCOLORED, CHANGED TO SOIL, FABRIC MAINLY PRESERVED	EXCAVATED BY HAND OR RIPPING (Saprolite)
HIGHLY WEATHERED	DISCOLORED, HIGHLY FRACTURED, FABRIC ALTERED AROUND FRACTURES	EXCAVATED BY HAND OR RIPPING, WITH SLIGHT DIFFICULTY
MODERATELY WEATHERED	DISCOLORED, FRACTURES, INTACT ROCK-NOTICEABLY WEAKER THAN FRESH ROCK	EXCAVATED WITH DIFFICULTY WITHOUT EXPLOSIVES
SLIGHTLY WEATHERED	MAY BE DISCOLORED, SOME FRACTURES, INTACT ROCK-NOT NOTICEABLY WEAKER THAN FRESH ROCK	REQUIRES EXPLOSIVES FOR EXCAVATION, WITH PERMEABLE JOINTS AND FRACTURES
FRESH	NO DISCOLORATION, OR LOSS OF STRENGTH	REQUIRES EXPLOSIVES

IGNEOUS/METAMORPHIC ROCK JOINT/FRACTURE DESCRIPTIONS

FIELD TEST	DESCRIPTION
NO OBSERVED FRACTURES	UNFRACTURED/UNJOINTED
MAJORITY OF JOINTS/FRACTURES SPACED AT 1 TO 3 FOOT INTERVALS	SLIGHTLY FRACTURED/JOINTED
MAJORITY OF JOINTS/FRACTURES SPACED AT 4-INCH TO 1 FOOT INTERVALS	MODERATELY FRACTURED/JOINTED
MAJORITY OF JOINTS/FRACTURES SPACED AT 1-INCH TO 4-INCH INTERVALS WITH SCATTERED FRAGMENTED INTERVALS	INTENSELY FRACTURED/JOINTED
MAJORITY OF JOINTS/FRACTURES SPACED AT LESS THAN 1-INCH INTERVALS; MOSTLY RECOVERED AS CHIPS AND FRAGMENTS	VERY INTENSELY FRACTURED/JOINTED

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KEY TO LOGS | Figure 3

PROJECT NO. **S9534-06-02A** PROJECT NAME **Schwarzgruber Mine**

BORING 2020B1

ELEV. (MSL.) **~ 74 feet** DATE COMPLETED **12/11/2020**

ENG./GEO. **H. Losberger** DRILLER **V&W Drilling**

EQUIPMENT **Truck Mounted CME 55 with Hollow Stem Auger** HAMMER TYPE **Automatic | 140 lbs**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0				GP-GC	**ALLUVIUM** Moist, dense, tan with gray Poorly Graded GRAVEL with Clay and Sand			
1								
2								
3	B1-3.0							
4	B1-3.5					52		2.1
5	B1-5.0				- becomes very dense	50/6"		
6								
7				GP-GC	Moist, very dense, tan with gray, white and black, Poorly Graded Gravel with Clay and Sand			
8	B1-8.0							
9	B1-8.5					69/9"		8.1
10	B1-10.0							
11	B1-10.5					75/12"		
12								
13								
14								
15	B1-15.0				- becomes dense	39		
16								
17								
18								
19								
20	B1-20.0					40		
21								
22								
23								
24								

Figure 4, Log of Boring, page 1 of 2

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SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ◧ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ◥ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

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

PROJECT NO. **S9534-06-02A** PROJECT NAME **Schwarzgruber Mine**

BORING 2020B1

ELEV. (MSL.) **~ 74 feet** DATE COMPLETED **12/11/2020**

ENG./GEO. **H. Losberger** DRILLER **V&W Drilling**

EQUIPMENT **Truck Mounted CME 55 with Hollow Stem Auger** HAMMER TYPE **Automatic | 140 lbs**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
25	B1-25.0			GP-GC	Moist, very dense, tan with gray, white and black, Poorly Graded Gravel with Clay and Sand	30		
26								
27				CL	Wet, very stiff, yellowish brown with black, moderately to highly plastic CLAY with very fine Sand PP= 4.5 tsf - driller notes smoother drilling conditions			
28								
29								
30			▼					
31	B1-30.5 B1-31.0					32	113.3	18.3
32								
33								
34								
35				CL	Wet, medium stiff, yellowish brown, moderately plastic CLAY with fine Sand; softer drilling conditions PP= 1.5 tsf			
36	B1-35.5 B1-36.0					12		
37								
38								
39								
40								
41	B1-40.5 B1-41.0				- becomes stiff PP= 3.0 tsf	32		
					BORING TERMINATED AT 41.5 FEET GROUNDWATER ENCOUNTERED AT 30.0 FEET BACKFILLED WITH NEAT CEMENT GROUT			

Figure 5, Log of Boring, page 2 of 2

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SAMPLE SYMBOLS
- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ▩ ... DISTURBED OR BAG SAMPLE
- ◪ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

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

PROJECT NO. **S9534-06-02A** PROJECT NAME **Schwarzgruber Mine**

BORING 2020B2

ELEV. (MSL.) **~82 feet** DATE COMPLETED **12/11/2020**

ENG./GEO. **H. Losberger** DRILLER **V&W Drilling**

EQUIPMENT **Truck Mounted CME 55 with Hollow Stem Auger** HAMMER TYPE **Automatic | 140 lbs**

DEPTH IN FEET	SAMPLE NO.	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
0						
1		SC	**FILL** Moist, very stiff, yellow brown with grey Clayey SAND with Gravel			
2						
3	B2-3.0					
4	B2-3.5			44		6.0
5		GP	**ALLUVIUM** Moist, dense to very dense, yellowish brown with gray and white, Silty Poorly Graded GRAVEL with Sand			
6	B2-5.5 B2-6.0			68/12"		
7						
8	B2-8.0					
9	B2-8.5			52		3.2
10	B2-10.0		- sandy layer; becomes clayey			
11	B2-10.5 B2-11.0			42		
12						
13						
14						
15	B2-15.0	GP	Moist, dense, yellowish brown with gray, Clayey Poorly Graded GRAVEL with Sand	28		
16						
17						
18						
19						
20	B2-20.0			21		
21						
22						
23						
24						

Figure 6, Log of Boring, page 1 of 3

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SAMPLE SYMBOLS: ☐ ... SAMPLING UNSUCCESSFUL; ◧ ... STANDARD PENETRATION TEST; ■ ... DRIVE SAMPLE (UNDISTURBED); ⊠ ... DISTURBED OR BAG SAMPLE; ◪ ... CHUNK SAMPLE; ▼ ... WATER TABLE OR SEEPAGE

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BORING 2020B2

ELEV. (MSL.) **~82 feet** DATE COMPLETED **12/11/2020**

ENG./GEO. **H. Losberger** DRILLER **V&W Drilling**

EQUIPMENT **Truck Mounted CME 55 with Hollow Stem Auger** HAMMER TYPE **Automatic | 140 lbs**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
25	B2-25.0			GP-GC	Moist, dense, yellowish brown with gray, Clayey Poorly Graded GRAVEL with Sand	34		
26								
27								
28								
29								
30	B2-30.0				- sandy layer	40		
31								
32								
33								
34								
35	B2-35.0					41		
36								
37								
38								
39								
40	B2-40.0					33		
41								
42								
43								
44								
45	B2-45.0		▼		- becomes wet	34		
46								
47								
48								
49								

Figure 7, Log of Boring, page 2 of 3

IN PROGRESS S9534-06-02A SCHWARZGRUBER.GPJ 01/11/21

GEOCON

SAMPLE SYMBOLS

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

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

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

PROJECT NO. **S9534-06-02A** PROJECT NAME **Schwarzgruber Mine**

BORING 2020B2

ELEV. (MSL.) **~82 feet** DATE COMPLETED **12/11/2020**

ENG./GEO. **H. Losberger** DRILLER **V&W Drilling**

EQUIPMENT **Truck Mounted CME 55 with Hollow Stem Auger** HAMMER TYPE **Automatic | 140 lbs**

DEPTH IN FEET	SAMPLE NO.	LITHOLOGY	GROUNDWATER	SOIL CLASS (USCS)	MATERIAL DESCRIPTION	PENETRATION RESISTANCE (BLOWS/FT.)	DRY DENSITY (P.C.F.)	MOISTURE CONTENT (%)
50	B2-50.0			CL	Wet, stiff, yellowish brown with black, highly plastic CLAY with fine Sand	21		
51								
52								
53								
54								
55				CL	Wet, medium stiff, yellowish brown with black, moderately plastic CLAY with fine Sand PP= 1.0 tsf; softer drilling conditions.			
56	B2-55.5 B2-56.0					11	94.9	30.4
57								
58								
59								
60								
61	B2-60.5 B2-61.0					30		
					BORING TERMINATED AT 61.5 FEET GROUNDWATER ENCOUNTERED AT 45.0 FEET BACKFILLED WITH NEAT CEMENT GROUT			

Figure 8, Log of Boring, page 3 of 3

GEOCON

SAMPLE SYMBOLS
- ☐ ... SAMPLING UNSUCCESSFUL
- ◧ ... STANDARD PENETRATION TEST
- ■ ... DRIVE SAMPLE (UNDISTURBED)
- ⊠ ... DISTURBED OR BAG SAMPLE
- ◥ ... CHUNK SAMPLE
- ▼ ... WATER TABLE OR SEEPAGE

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

Sample ID	Depth (feet)	Liquid Limit	Plastic Limit	Plasticity Index	Maximum Size (mm)	%<#200 Sieve	Water Content (%)	Dry Density (pcf)
2020-B1-Bulk	0	28	14	14	---	6.0		
2020-B1-3.5	3.5				---		2.1	
2020-B1-8.5	8.5	25	15	10	---		8.1	
2020-B1-10.5	10.5				---	7.4		
2020-B1-20	20				---	9.0		
2020-B1-31	31	40	15	25	---	89.7	18.3	113.3
2020-B2-Bulk	0	36	17	19	---	45.5		
2020-B2-3.5	3.5				---		6.0	
2020-B2-8	8				---	5.6		
2020-B2-8.5	8.5	16	18	NP	---		3.2	
2020-B2-15	15				---	7.3		
2020-B2-35	35				---	9.1		
2020-B2-56	56	45	20	25	---	99.0	30.4	94.9

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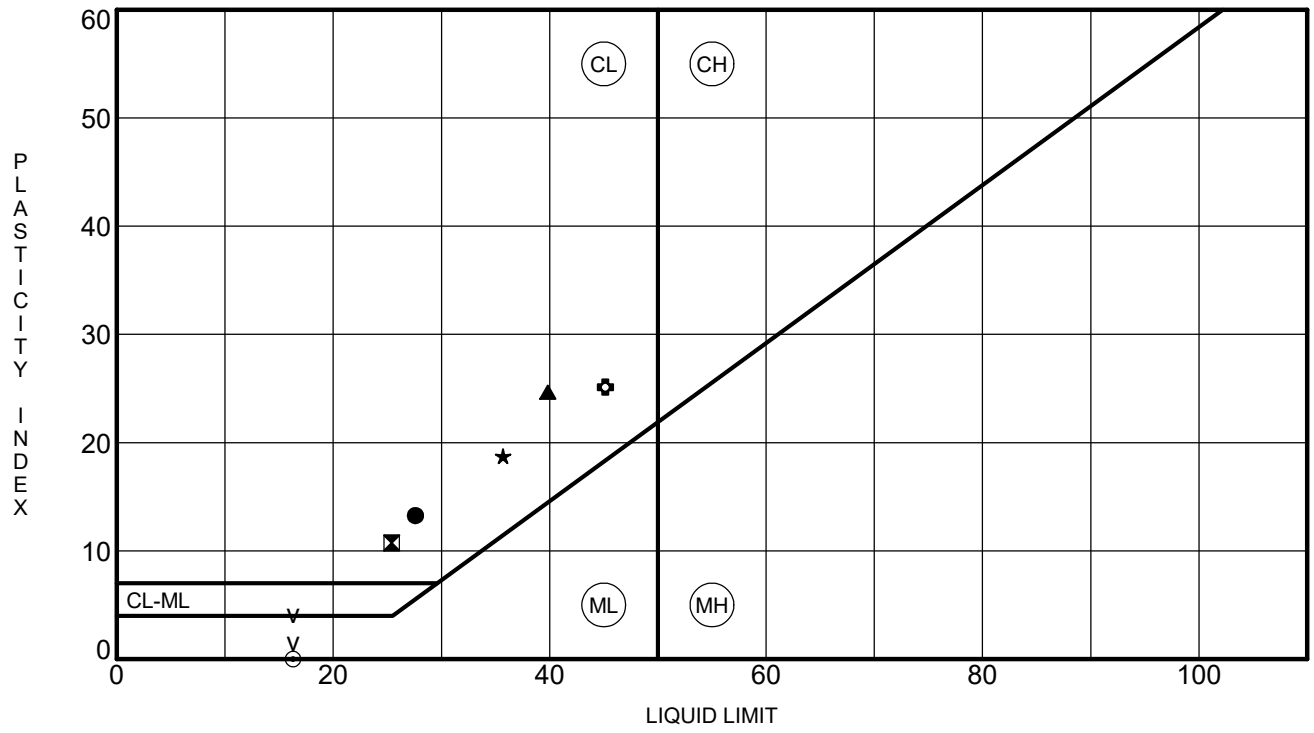
Summary of Laboratory Results

Project: Schwarzgruber Mine
Location: Woodland, California
Number: S9534-06-02A
Figure: 9

US LAB SUMMARY GEOTECH 2 S9534-06-02A SCHWARZGRUBER.GPJ US_LAB.GDT 12/31/20



	Sample No.	Liquid Limit	Plastic Limit	Plasticity Index	% Pass #200 Sieve	Unified Soil Classification Description	Preparation Method
●	**2020-B1-Bulk**	**28**	**14**	**14**	**6.0**	**POORLY GRADED GRAVEL with CLAY and SAND(GP-GC)**	**dry**
⊠	**2020-B1-8.5**	**25**	**15**	**10**		**Poorly graded GRAVEL with clay and SAND (GP)**	**dry**
▲	**2020-B1-31**	**40**	**15**	**25**	**89.7**	**LEAN CLAY(CL)**	**dry**
★	**2020-B2-Bulk**	**36**	**17**	**19**	**45.5**	**CLAYEY SAND with GRAVEL(SC)**	**dry**
⊙	**2020-B2-8.5**	**16**	**18**	**NP**		**Poorly graded GRAVEL with sand (GP)**	**dry**
✿	**2020-B2-56**	**45**	**20**	**25**	**99.0**	**LEAN CLAY(CL)**	**dry**

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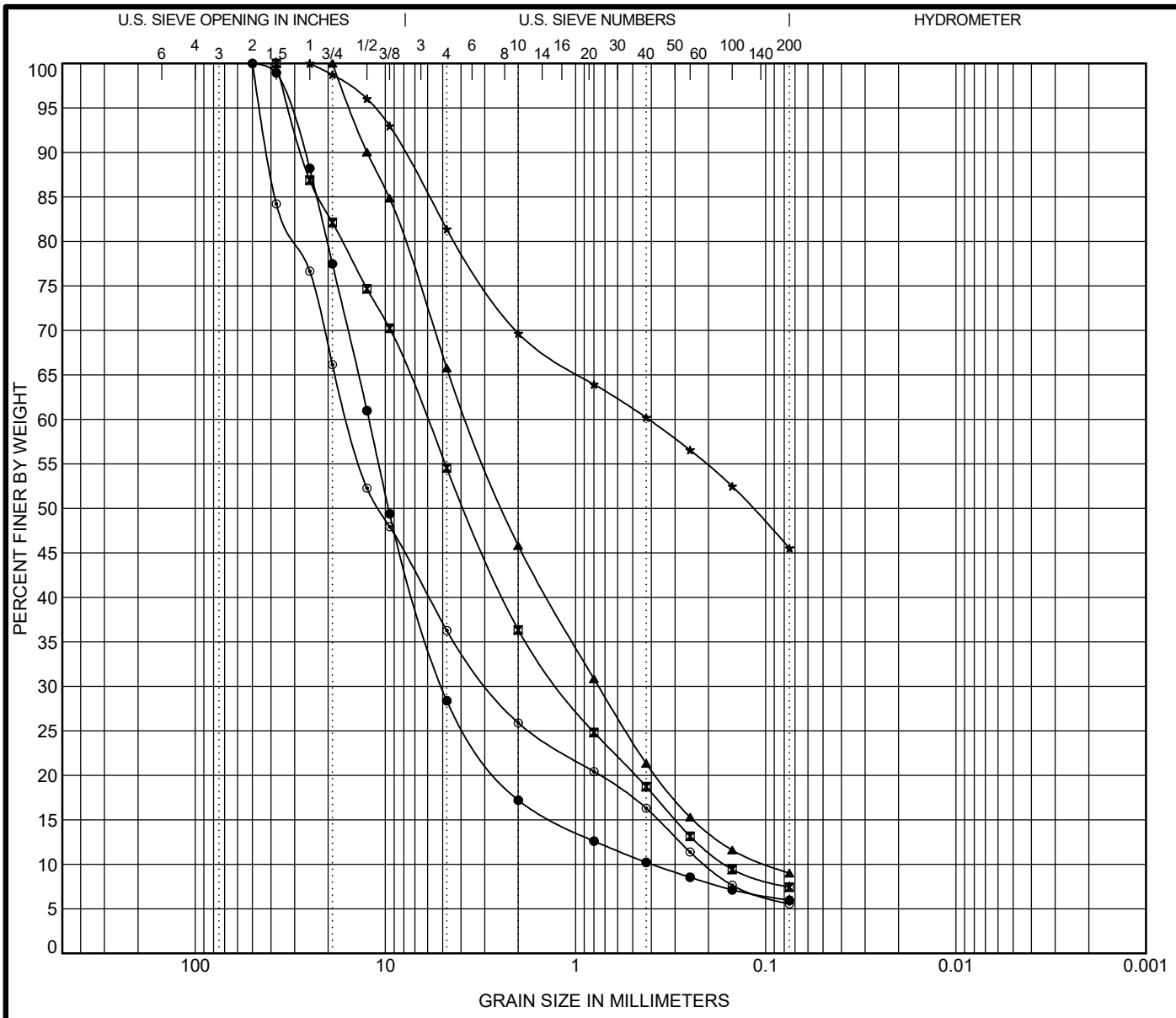
ATTERBERG LIMITS (ASTM D4318)

Project: Schwarzgruber Mine
Location: Woodland, California
Number: S9534-06-02A
Figure: 10

PI COPY 2 S9534-06-02A SCHWARZGRUBER.GPJ US_LAB.GDT 1/11/21



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample No.	Classification	LL	PL	PI	Cc	Cu
●	2020-B1-Bulk	POORLY GRADED GRAVEL with CLAY and SAND(GP-GC)	28	14	14	5.19	30.9
⊠	2020-B1-10.5	Poorly graded SAND with clay and GRAVEL (SP-SC)				1.49	37.3
▲	2020-B1-20	Poorly graded SAND with clay and GRAVEL (SP-SC)				1.58	37.8
★	2020-B2-Bulk	CLAYEY SAND with GRAVEL(SC)	36	17	19		
⊙	2020-B2-8	Poorly graded GRAVEL with sand (GP)				2.43	76.3

	Sample No.	D100	D50	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	2020-B1-Bulk	50	9.637	5.011	0.396	71.6	22.4	6.0	
⊠	2020-B1-10.5	37.5	3.829	1.208	0.162	45.5	47.1	7.4	
▲	2020-B1-20	19	2.399	0.756	0.098	34.2	56.8	9.0	
★	2020-B2-Bulk	25	0.117			18.6	35.8	45.5	
⊙	2020-B2-8	50	10.824	2.818	0.207	63.7	30.7	5.6	

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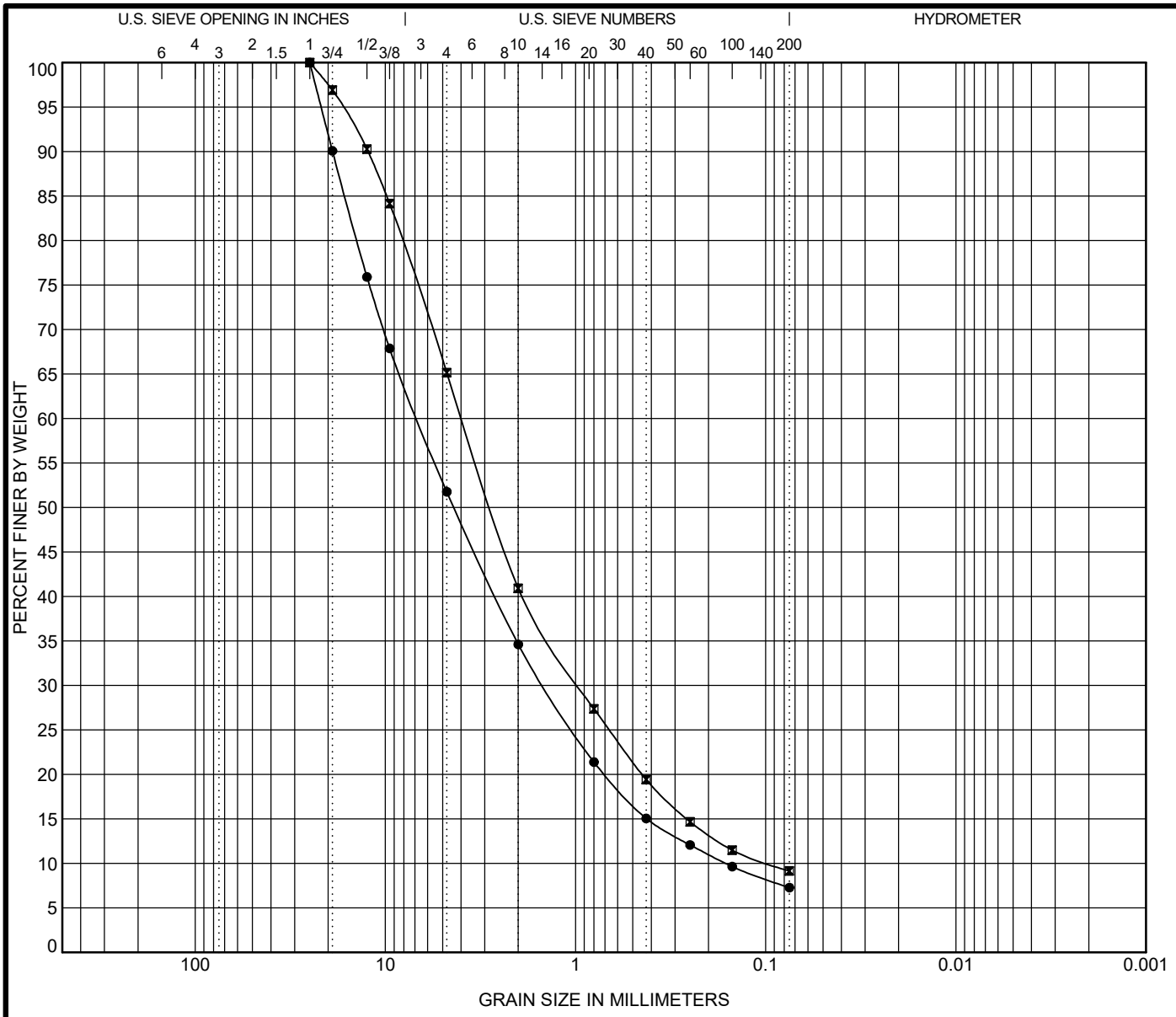
GRAIN SIZE DISTRIBUTION (ASTM D422, D6913)

Project: Schwarzgruber Mine
Location: Woodland, California
Number: S9534-06-02A
Figure: 11

GRAIN SIZE COPY 2 S9534-06-02A SCHWARZGRUBER.GPJ US LAB.GDT 1/11/21



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample No.	Classification	LL	PL	PI	Cc	Cu
●	**2020-B2-15**	**Poorly graded GRAVEL with sand (GP)**				**1.93**	**41.8**
⊠	**2020-B2-35**	**Poorly graded SAND with clay and gravel (SP-SC)**				**2.39**	**40.9**

	Sample No.	D100	D50	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**2020-B2-15**	**25**	**4.347**	**1.453**	**0.162**	**48.2**	**44.5**	**7.3**	
⊠	**2020-B2-35**	**25**	**2.766**	**0.956**	**0.097**	**34.8**	**56.0**	**9.1**	

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GRAIN SIZE DISTRIBUTION (ASTM D422, D6913)

Project: Schwarzgruber Mine
Location: Woodland, California
Number: S9534-06-02A
Figure: 12

GRAIN SIZE COPY 2 S9534-06-02A SCHWARZGRUBER.GPJ US LAB.GDT 1/11/21