



**EARTHRES**  
ENGINEERING FOR SUCCESS™

April 25, 2019

Michael J. Kutney, P.G.  
Chief Permits & Technical Session  
Department of Environmental Protection  
Pottsville District Mining Office  
5 West Laurel Boulevard  
Pottsville, PA 17901-2454

**SUBJECT: Response to PA DEP and East Rockhill Township Comments  
Qualitative Geologic Survey Sampling Plan  
Rock Hill Quarry, SMP No. 7974SM1  
East Rockhill Township, Bucks County, PA  
EARTHRES Project No. 061003.051**

Dear Mike:

I am in receipt of the Department's comments via email dated April 22, 2019, which pertain to the proposed core drilling investigation submitted in the *Qualitative Geologic Survey Sampling Plan* (QGSSP) dated April 3, 2019 for the Rock Hill Quarry site. On behalf of Hanson Aggregates Pennsylvania, LLC (Hanson), I am providing the following responses to the Department's comments and East Rockhill Township's comments (dated April 17, 2019), which you forwarded to my attention. The comments are presented below, followed by our responses in *italics*:

- 1) Per our discussion on Friday, April 19, I voiced concerns regarding the Department's (core drilling) comments nos. 1, 3, and 4. It was my position that those had not been adequately addressed and therefore, the Department would not authorize core drilling until those comments are adequately addressed. Below is a summary of those concerns, as well as additional comments resulting from a review of the attached documents.**

*EARTHRES and Hanson professional geologists were onsite Monday April 22, 2019 to map mineral vein features exposed on the benches proposed for drilling and ultimately mining activities. The results of that effort are attached to these responses. Overall, the features found were trending as expected provided the geological environment, the geological evaluation contained in our report of January 2018, our QGSSP dated April 3, 2019 and our prior comment responses of April 17 and 19, 2019. Additional detailed responses to your questions are provided in the following comment responses and in the attached documents.*

- 2) **The Aggregates Handbook appears to be geared toward characterization of the aggregate deposit, not investigating unfavorable components within it (in this case veins which may contain asbestos). Using its guidance for the purpose of investigating mineral veins seems inappropriate. Please explain why following the guidance in the Aggregates Handbook is appropriate in this case (PADEP comment #3).**

*The Aggregates Handbook, the NSSGA Guide, the condition of the highwalls, and our prior experience at the site, that included significant sampling, were all used as a guide for selecting drilling locations to clear the selected benches for mining. We indicated in prior responses that the work would be iterative and dependent on the results of the drilling and sampling. However, based upon the field work completed this week we have analyzed the data and modified the initially proposed drilling locations as requested.*

- 3) **Both the NSSGA Guide and the Aggregates Handbook encourage a proper mapping effort as part of the investigations described in these documents. The Department has notified Hanson during the December and February meetings and during other discussions that it expects the veins at the Rock Hill quarry to be mapped and described. To date, the Department has not received any information from Hanson regarding the mapping effort or its results. Results from a comprehensive mapping effort could effectively answer the Department's comments #1, #3 and #4 regarding the core drilling as well as East Rockhill Township's comment #4.**

*Please find the attached table that includes the geological data (i.e. strike, dip, and description) of the bench-face features found during the on-site mapping completed on April 22, 2019. The data was statistically analyzed using Rockworks software to determine the average strike and dip of the features. A stereonet plot of the data is attached and indicates an average strike of the vein features to be N45E, dipping steeply at 78 degrees SE. The average feature strike is in agreement with the regional strike direction indicated the QGSSP submitted on April 3, 2019. Also provided herein are photographs of the mapped features that are keyed to their locations on each bench (Drawing D-1: Bench Face Mapping). The data was further plotted in 3D using AutoCAD to evaluate feature trends with respect to the proposed drilling locations.*

*The proposed coring locations and mapped features are shown in map view on the attached Figure 1. The cores will be drilled on an approximately 30-degree angle from vertical with an azimuth of approximately N45W. The drilling direction is oriented perpendicular to geological strike and is dipping opposite of the found features in order to intercept as many potential features as practical. The core borings will be advanced to an elevation of approximately 585 feet above mean sea level (MSL), which is approximately equivalent to the current water level in the Quarry pit.*

*Core Borings 1 (B-1) and B-2 are proposed to be located on Bench 1. The B-1 location was chosen to intercept the Veins 1, 3, 4, and 7. Coring B-2 is proposed in an area where face-mapped features are not projected to be present, thus providing additional geological coverage.*

*Core Borings B-3 and B-4 are proposed to be located on Bench 2. The B-3 location was chosen to intercept the Veins 1, 6, 10 and 11. B-4 is proposed to intercept Veins 12 and 13 and provide additional geological coverage in an area where face-mapped features are not projected to be present.*

*Logging and sampling of the retrieved cores will be completed as indicated in the April 3, 2019 QGSSP.*

- 4) **The NSSGA Guide also describes a program for testing for Settled Dust. Please explain why testing for Settled Dust has not been proposed for this site.**

*The Site has not operated since November 2018. Based upon the results of the current investigations, settled dust sampling will be proposed if appropriate. Such a recommendation would be outlined in the Qualitative Geologic Survey Report.*

**Responses to East Rock Hill Township Comments Dated April 17, 2019:**

1. **Aggregate Storage Pile Sampling:** The Plan only lists four aggregate storage piles, but more than four stockpiles are clearly visible on Figure 1A, which appears to be a Google Earth image from June 2018. Please ensure that all material stockpiled at the site is included in the scope of the Plan.

*The four (4) aggregate storage piles proposed for sampling, and since sampled with the Department's approval and oversight, were the only processed aggregate stockpiles present at the site in November 2018 when site operations were halted.*

2. **Aggregate Sampling Frequency:** The origin and intent of PADEP's requirement of "one test per 1,000 tons of material or any fraction thereof..." is unknown. This requirement may be based on construction standards which are designed to characterize the mechanical properties of the material and not its hazardous composition. Other PADEP programs, such as for the management of fill, would require an increased sampling frequency. Furthermore, if the storage piles will be divided into "fractions," such as truck or crusher loads, then PADEP should require additional sampling than what is proposed in the Plan.

*The sampling frequency of the piles was mandated by the Department and was based upon the California Air Resources Board Method 435 (CARB 435). The sample*

*frequency provided therein is for determining the presence of asbestos fibers in Serpentine Aggregate stockpiles. The method is not specifically designed for the geology being mined at the Rock Hill Quarry, as the operators are not proposing to mine Serpentine Aggregate. Rather the site is proposing to mine an asbestos-free host rock (diabase) that contains mineral veins that potentially contain trace actinolite asbestos. However, as California has the most developed programs and guidance for asbestos determinations, we surmise that the Department mandated a conservative (greater) initial sampling frequency for the processed aggregate stockpiles based upon that available guidance.*

*Future aggregate sampling frequency (if deemed to be appropriate) will be further based upon the results accumulated by the QGSSP data. Currently, thirty-three (33) aggregate and drill cutting samples have been analyzed as previously reported, and an additional sixteen (16) aggregate samples were collected and submitted for analysis on April 18, 2019 as part of the approved QGSSP.*

3. **Rock Coring and Sampling Location:** The rock coring locations are limited to the southeastern corner of the site in an area referred to as the "planned mining area." However, the "planned mining area" is not delineated on the figure and the area/amount of material to be mined is not otherwise described in the Plan. The rock coring locations should not be limited to this area but should cover the entire area covered by the mining permit, but a bare minimum should include coring of the boulder field along the southern and eastern sides of the site, at a minimum frequency no greater than that provided for the "planned mining area." If the mining permit allows the operator to mine and blast in other areas of the quarry, then these areas should also be surveyed for asbestos-containing mineral veins to understand which areas should be avoided.

*The drilling program included in the April 3, 2019 QGSSP was designed for the two (2) targeted benches only. As indicated previously, any future sampling will be based upon the results obtained from this initial drilling program.*

4. **Rock Coring and Sampling Frequency:** While the amount of material in the "planned mining area" is not described in the Plan, the number and spacing of the rock cores shown on Figure 1B is insufficient. The cores are spaced approximately 75 to 250 feet apart, and many asbestos-containing mineral veins could exist between the cores and would therefore not be accounted for in the survey.

*Please see our detailed response to the Department's Comment #3. The drilling locations were adjusted as described based upon the found geological features. If the results indicate the presence of naturally occurring asbestos-containing mineral veins, additional sampling may be proposed.*

5. **Boulder Field Size and Location:** The Plan describes the boulder field as existing to the southern and eastern sides of the quarry pit, but does not offer any description of the size, depth, or amount of material contained in the boulder field. The Plan also does not describe the geology or the origin of the boulder field. Additionally, sampling 30 boulders on the surface is insufficient to characterize the horizontal and vertical extent of the material.

*The boulders are erosional remnants and/or were placed by historical mining. However, the origin and geology of the boulder field will be described in the Qualitative Geologic Survey Report after the investigation of the boulders is complete. The intention of the boulder investigation is to evaluate easily accessible rock for the potential presence of mineral veins, and if found, collect samples as appropriate. The intention is not to map the horizontal and vertical extent of the materials. Similar to other parts of the proposed investigation, if asbestos containing mineral veins are found in the investigation, additional sampling and or handling of the boulders will be proposed.*

6. **Boulder Field Sampling Bias:** The boulder field is proposed to be sampled, and sample locations are to be selected, by the geologist in the field. The geologist employed by the operator should not be left with the discretion to pick and choose boulders to sample, particularly when there may be an interest in avoiding boulders with potential asbestos veins. For this reason, other PADEP programs regulating site remediation and waste characterization require sampling locations to be biased towards observed contamination or to be based on a truly randomized sampling grid to remove the potential for bias when selecting samples for analysis.

*By looking for and specifically sampling suspected asbestiform mineral veins, the proposed sampling is actually biased towards finding asbestos, if present, not avoiding it. Additionally, a licensed professional geologist will complete the work and will be accompanied by a Department staff member.*

7. **Wind Erosion of Aggregate Storage Piles:** Wind erosion of the storage piles and open areas of the site can create significant air emissions depending on local wind conditions. If such wind erosion is expected or observed, the Plan should seek to determine the asbestos content of those surfaces that may erode and become airborne.

*Air quality sampling is addressed under the air quality permit. Significant background sampling has already been conducted. No detections of airborne Naturally Occurring Asbestos (NOA) were found.*

8. **Roadway Dust Emissions:** Heavy truck traffic on the unpaved roads at the site is a significant source of air emissions. The Plan should include an analysis of the silt and asbestos content of the road surface so that the potential emissions from this source can be understood.

*See our response to Comment #7. Additionally, potential fugitive dust emissions from unpaved roads at the site are controlled by engineering controls (i.e. regular use of the site water truck).*

9. **Water Sampling Locations:** The Plan states that water samples will be collected from four locations. However, there are clearly more than four water features present at the quarry. These locations should be included in the Plan and water and sediment samples should be collected from these locations.

*Additional water sampling was requested by the Department and completed at the site on April 18, 2019. Water samples were collected from the following locations: NPDES 001 outfall, Sediment Pond No. 1, Sediment Pond No. 2, Quarry Pit, Sediment Trap No. 1, Sediment Trap No. 2, and Sediment Trap No. 3.*

10. **Sediment Sampling:** The Plan states that water samples will be collected from various locations including sedimentation basins. Since any asbestos present in the water would be expected to settle, the Plan should also include sediment sampling at these locations.

*The basins and sediment traps were sampled near their discharge structures and towards where captured water containing suspended solids migrates (prior to becoming sediment). The water samples collected were indicated to contain some suspended solids, which will be the focus of the analysis.*

11. **Sampling Oversight:** Due to the potential bias that may be introduced during sampling, we request that a licensed geologist employed by the department be present during all sampling collection activities.

*Sampling proposed in the plan was, and will be conducted, in the presence of a PADEP staff member experienced in sampling methodology. In addition, sampling was conducted by or directed by a Pennsylvania licensed Professional Geologist.*

12. **Potential for Asbestos Releases:** The CERCLA Reportable Quantity for friable asbestos is 1 pound. Emission calculations for the crushing/screening plant estimate potential particulate matter emissions to be 83 pounds *per hour*. Mining, blasting, wind erosion, and truck traffic will contribute additional particulate matter emissions. Therefore, even minimal amounts of asbestos contained in the quarry

**materials could easily create a "CERCLA release" once they have been rendered airborne by the operator. This suggests that a significantly more rigorous and quantitative analysis of the quarry material is necessary.**

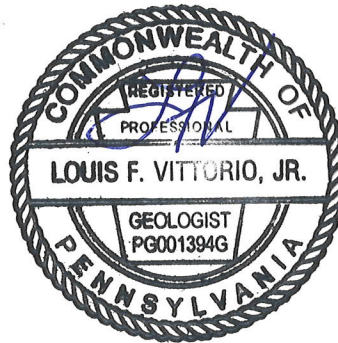
*The Rock Hill Quarry is not a CERCLA site, for which the above referenced emission regulation is intended to address. However, air emissions via air quality sampling is addressed under the air quality permit. The air monitoring requirements may be reevaluated based upon the results of the QGSSP and the potential for asbestos release.*

I trust that the information provided herein in response to the presented comments is more than sufficient to allow the core drilling portion of the QGSSP to move forward. In the meantime, if you have any questions regarding the comment responses, please feel free to contact me at (215) 766-1211.

Sincerely,  
**Earthres Group, Inc.**



Louis F. Vittorio, Jr., P.G.  
Vice President



Enclosures: Bench Face Mapping Data Tables  
Stereonet Plot and Statistics  
Drawing D-1: Bench Face Mapping  
Figure 1 – Geologic Features and Coring Location Plan

## **Bench Face Mapping Data Tables**



**Bench Face Mapping Data  
Rock Hill Quarry  
April 22, 2019**

**Face Below Lower Bench**

Vein ID	Strike	Dip	Photo Time	Description
1	N40E	75SE	8:31	4" to 6" wide weathered zone; no mineral veining visible.
2	N20W	90	8:44	Whitish, thin coating on diabase sub-parallel to wall face.
3	N52E	85SE	8:44	8" to 1.5' wide weathered fault/shear zone; whitish undulating mineral veining noted, green color noted at top of zone.
4	N64E	71SE	8:51	Approx. 8" wide brown highly weathered; whitish undulating mineral veining noted.
5	S80E	80SW	8:59	Whitish, very thin coating on diabase trending oblique to wall face.
6	N50E	84SE	9:02	Approx. 0.5" white haloed, dark colored vein.
7	N70E	82SE	9:08	Approx. 8" wide weathered vein; apparent Actinolite vein; green elongated flattened crystals; appears to pinch out further up the wall.
8	N30E	78SE	9:17	Approx. 0.5" white haloed, dark colored vein.
9	N15E	70SE	9:28	Approx. 4" wide banded white/greenish mineral vein.

**Face Below 2<sup>nd</sup> Bench**

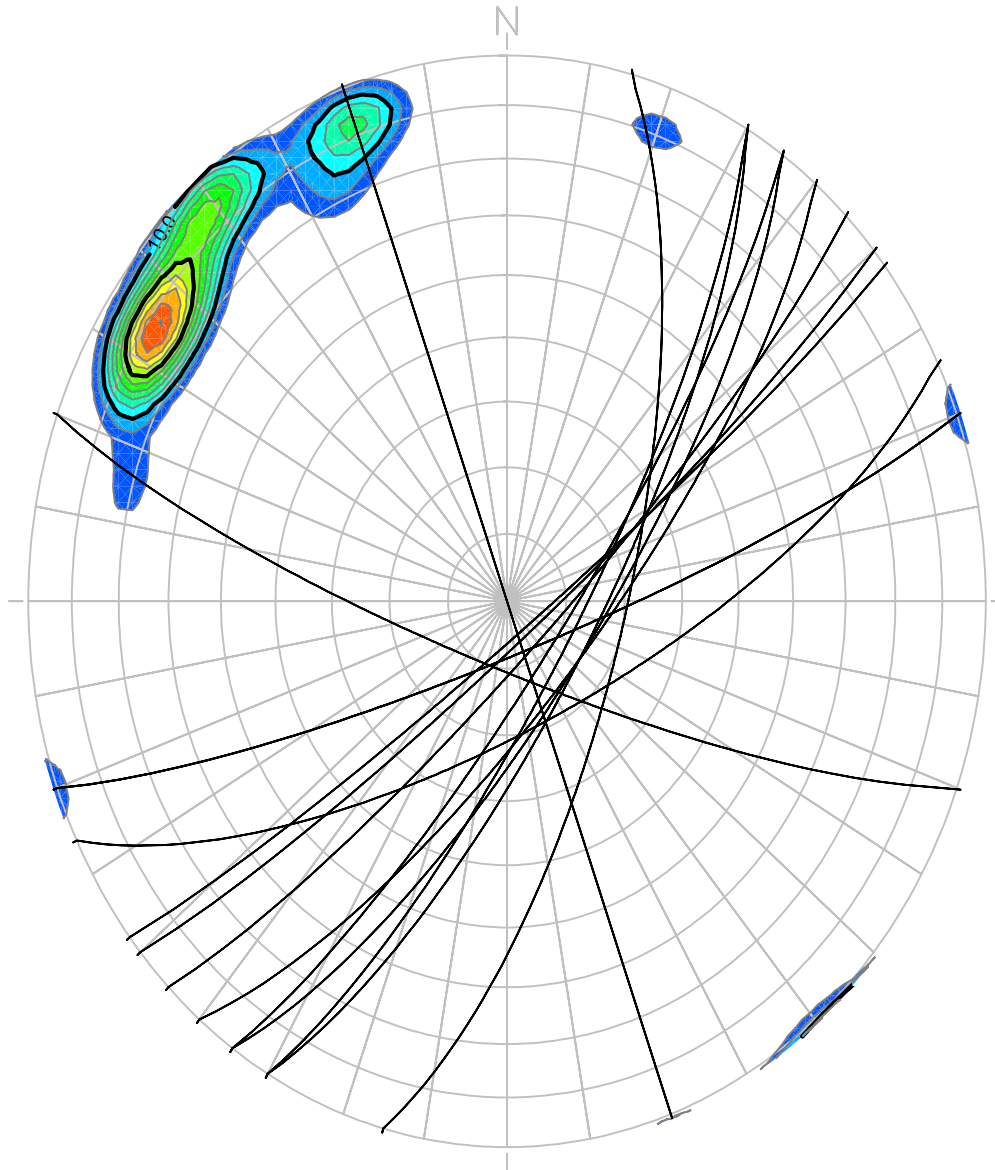
Vein ID	Strike	Dip	Photo Time	Description
10	N35E	80SE	10:04	South side of wall, white vein visible near top of wall; estimated narrow 1" vein.
11	N70E	82SE	10:10	Approx. 0.5" white vein, continuous trending up wall.
12	N30E	75SE	10:14	Approx. 8" to 12" mud vein, discontinuous in upper and lower wall due to weathering and talus; no white veins visibly noticeable.
13	N45E	82SE		Approx. 4" to 8" mud vein, located several feet north on wall from above Vein #3; discontinuous in upper and lower wall due to weathering and talus; central discolored white vein noticeable.

**Face Above 2<sup>nd</sup> Bench**

Vein ID	Strike	Dip	Photo Time	Description
NA	N35E	75SE	10:49	Weathered wall, general strike and dip of wall structure near center of wall recorded.

## **Stereonet Plot and Statistics**

# Rock Hill Quarry - Bench Mapping



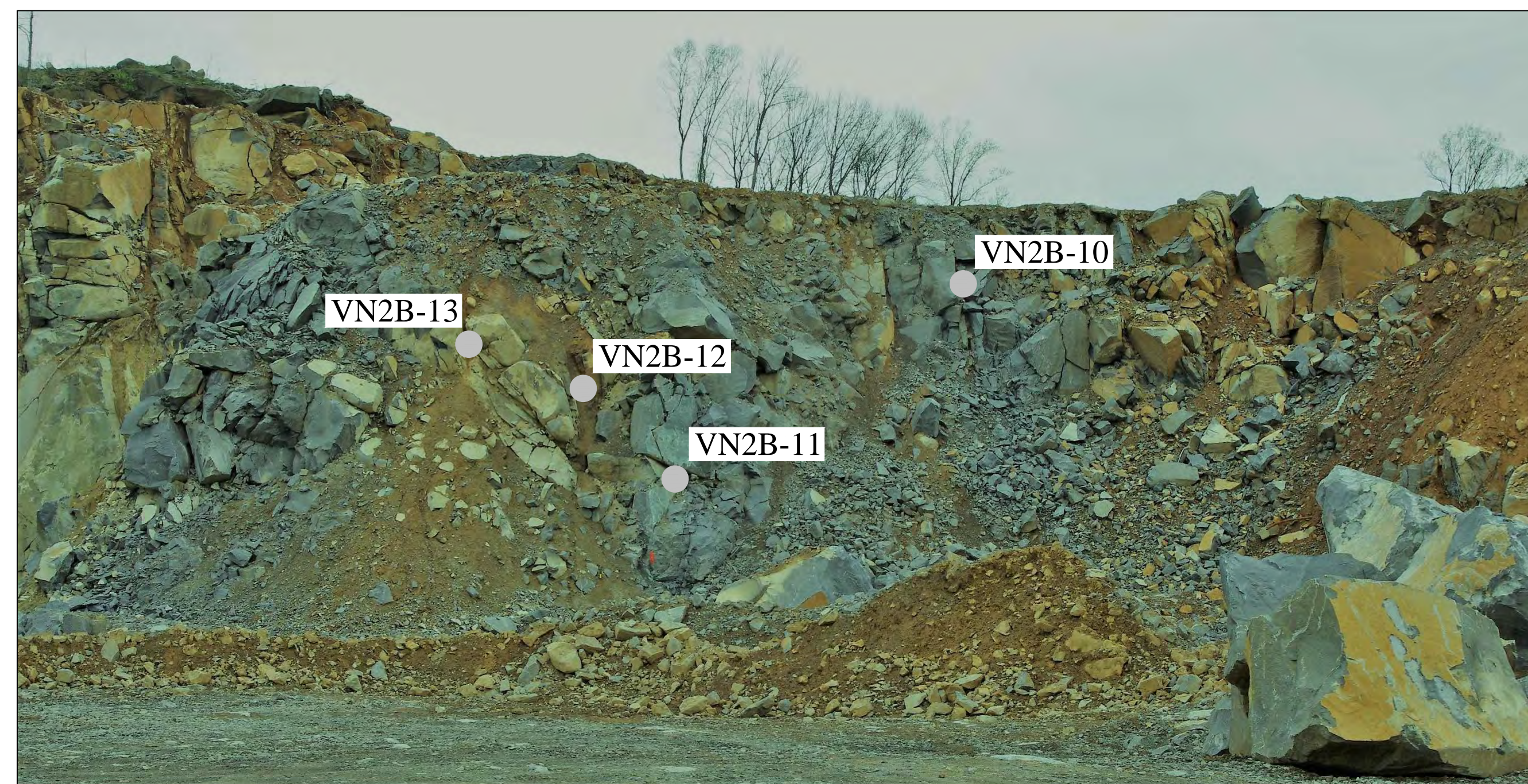
Statistical Summary	
Projection:	Schmidt (Equal Area)
Number of Sample Points:	14
Mean Lineation Azimuth:	314.7 <b>N44.7E</b>
Mean Lineation Plunge:	12.1 <b>77.9 SE</b>
Great Circle Azimuth:	227.9
Great Circle Plunge:	12.1
1st Eigenvalue:	0.814
2nd Eigenvalue:	0.178
3rd Eigenvalue:	0.007
LN ( E1 / E2 ):	1.518
LN ( E2 / E3 ):	3.17
(LN(E1/E2)] / (LN(E2/E3)):	0.479
Spherical Variance:	0.1178
Rbar:	0.8822

**Drawing D-1: Bench Face Mapping**

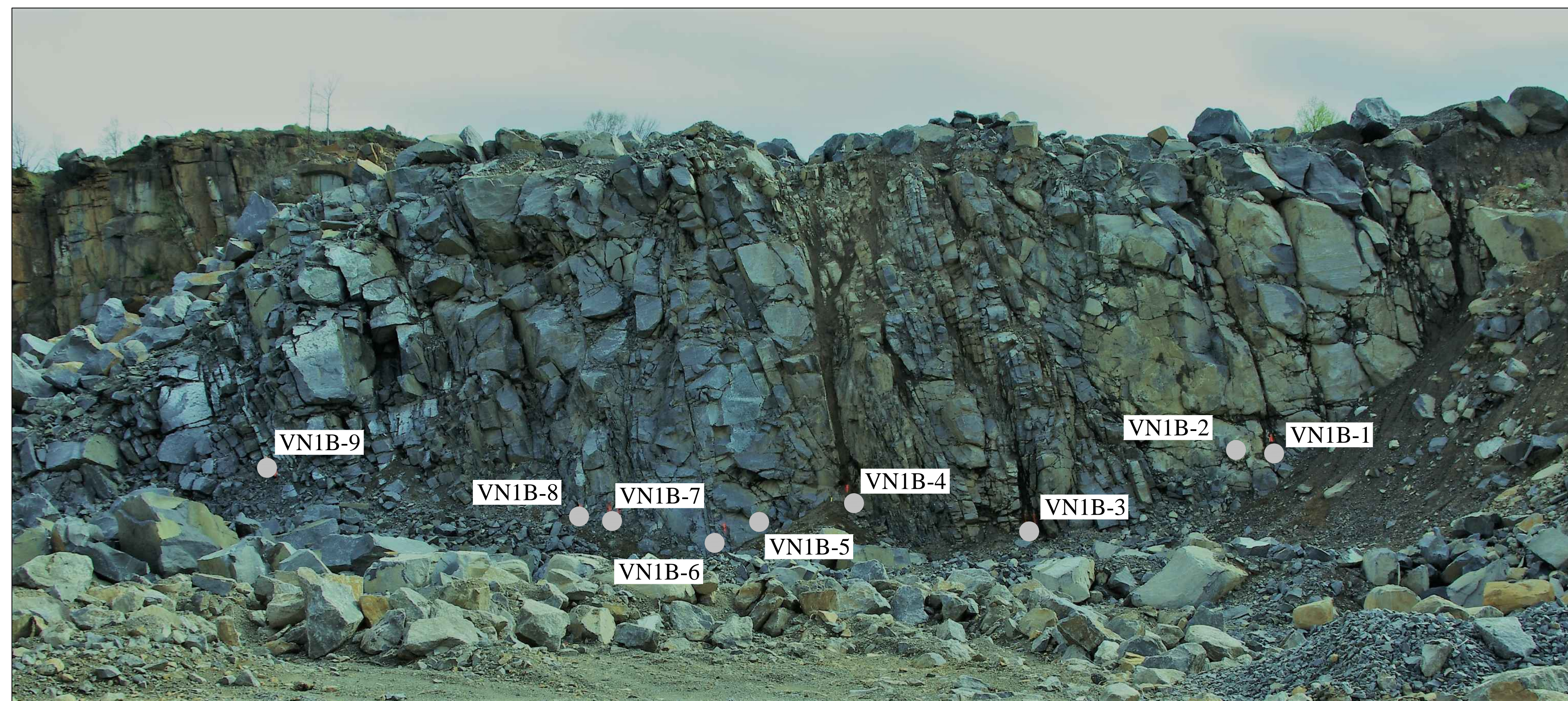
BENCH 3 FACE



BENCH 2 FACE (VN2B)



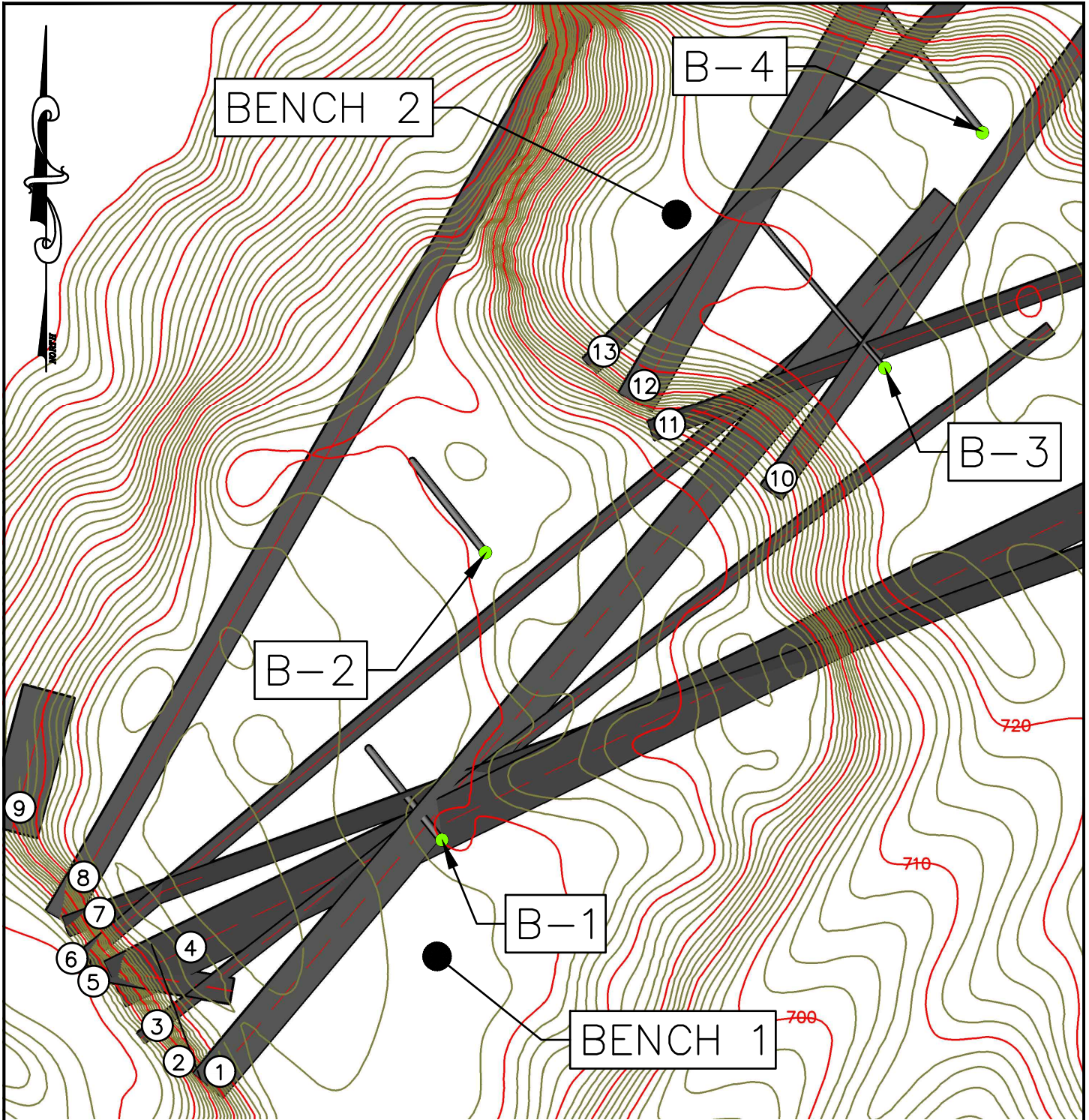
BENCH 1 FACE (VN1B)



DRAWN BY: JPT CHECKED BY: LTY DATE: 4-24-19 PROJECT NO: 081022.051 DRAWING NUMBER: D-1 SHEET 1 OF 1	BENCH FACE MAPPING ROCK HILL QUARRY ROCK HILL QUARRY HANSON AGGREGATES PENNSYLVANIA, LLC	PREPARED BY: EARTHRES ENGINEERING FOR SUCCESS® www.earthres.com	PREPARED FOR: HANSON HANSON AGGREGATES COMPANY	PROJECT SITE: ROCK HILL QUARRY 2055 NORTH ROCKHILL ROAD EAST ROCKHILL TOWNSHIP, BUCKS COUNTY, PA	REVISIONS NO. DATE BY
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## **Figure 1 – Geologic Features and Coring Location Plan**



BORINGS ARE MADE AT STRIKE N45W, DRILLED AT 30° FROM VERTICAL.



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DRAWN BY:  
JJB

DATE:  
4/25/19

DRAWING SCALE:  
1" = 50'

CHECKED BY:  
LFV

PROJECT NO:  
061003.051



**FIGURE 1**  
GEOLOGIC FEATURES AND BORING LOCATION PLAN

HANSON AGGREGATES PENNSYLVANIA, LLC  
ROCK HILL QUARRY  
2055 NORTH ROCKHILL ROAD  
EAST ROCKHILL TOWNSHIP, BUCKS COUNTY, PA