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**J. E. STOVER & ASSOCIATES, INC.**

2352 NORTH 7<sup>TH</sup> STREET, UNIT B  
GRAND JUNCTION, COLORADO 81501  
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MINE ENGINEERING  
MINE RECLAMATION

CIVIL ENGINEERING  
CONST. MANAGEMENT

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Via Electronic Transmittal

July 24, 2019

Janet Binns  
Division of Reclamation, Mining & Safety  
1313 Sherman St., Room 215  
Denver, CO 80203

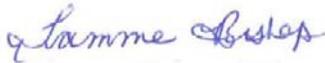
Re: Bowie Resources, LLC, Bowie No. 2 Mine  
Coal Mine Waste Banks & Instrumentation Monitoring  
Pond Quarterly Inspections  
Permit C-1996-083

Dear Ms. Binns:

Enclosed please find the referenced reports for the 2<sup>nd</sup> quarter of 2019, including the instrumentation and monitoring data from HBET.

Please call if you have any questions.

Sincerely,



Tamme Bishop, P.E.  
Project Engineer

cc: Basil Bear

## QUARTERLY POND INSPECTION REPORT

Operator:	Bowie Resources LLC	Quarter:	Second 2019
Mine:	Bowie No. 2 Mine - C-1996-083	Inspection Date:	04-Jun-19

<b>Pond Identification</b>	B	C	D - Gob Pile	F - New Gob	J UTL East	K UTL West
Type of Pond	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment

<b>Status During Inspection:</b>						
Approximate Water Level	5944	5992	Puddle	5948	5848	Damp
Sediment (% remaining)	90%	90%	85%	80%	90%	80%
Outflow (cfs)	0	0	0	0	0	0

<b>Features</b>	Problem	Problem	Problem	Problem	Problem	Problem
	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No

<b>Erosional</b>						
Rills & Gulleys	No	No	No	No	No	No
Inadequate Vegetation	No	No	No	No	No	No
Outlet Channel Erosion	No	No	No	No	No	No
Burrows	No	No	No	No	No	No
Other	No	No	No	No	No	No

<b>Structural</b>						
Differential Settling	No	No	No	No	No	No
Cracks or Slides	No	No	No	No	No	No
Seepage	No	No	No	No	No	No
Other	No	No	No	No	No	No

<b>Appurtenant Structures</b>						
Defective Spillways	No	No	No	No	No	No
Dewatering Devices Clogged	No	No	No	No	No	No
Faulty Gates, Etc.	No	No	No	No	No	No
Other	No	No	No	No	No	No

**Additional Comments**

Design depth measured from pond bottom to invert of emergency spillway:  
 Pond B=10, C=10, D=10, J=10, K=3, F=10' TD  
 Pond Bottom Elevations B=5942, C=5990, D=5970, J=5846, F=5944, K=5819  
 Pond B about a two of water and was below the primary spillway.  
 Pond C held about between 1-2' of water and was below the primary spillway.  
 Pond D was held less than a foot of water and was below the primary spillway.  
 Pond J held between 2-3' of water.  
 Pond K was wet with no standing water visible.  
 Pond F held about 4' of water.

SWMP components evaluated as part of this inspection. No corrections necessary at this time.

Name of Inspector: Tamme Bishop



## BOWIE RESOURCES, LLC

### Bowie No. 2 Mine

#### Coal Mine Waste Bank Nos. 1, 2, & 3 Inspections –2<sup>nd</sup> Quarter 2019

On June 4<sup>th</sup>, 2019, a visual inspection of the Bowie No. 2 Mine coal mine waste banks was performed by the undersigned in accordance with Rule 4.10.2. This inspection includes Gob Pile Nos. 1, 2, and 3. Pile No. 1 is considered inactive. Pile no. 2 is located north of Bowie Road. Pile no. 3 is located south of Bowie Road.

I, Tamme Bishop, P.E., have a wide variety of experience in the design and construction of earth fill embankments. Nothing was observed during the inspection that would indicate the piles have a potential for failure. The slips discussed in the 4Q 2016 and 1Q 2017 report had been regraded to the design contours and show no evidence that would be cause for concern of slipping again. A fair cover of volunteer vegetation has been established.

A small area of seepage discussed in past reports, at the toe of gob pile #2 and west of the haul road has begun to seep again, however there is no movement or slips associated with the seep. There are no windrows remaining on top of gob pile #2. All organic material and topsoil has been removed ahead of the waste bank founding. The diversion ditches were cleaned out during June, 2017 and were in good repair. The upper diversion and lower ditches at gob pile #3 were inspected, and were in good condition, however the upper diversion ditch should be cleaned out during 2019. The lower diversion ditch (J3) was cleaned out in May 2017, the Operator plans to clean it out again this spring or summer. A new seep has been discovered at gob pile #3, north of the east drying area. At this time, the seep will not impact the long-term stability of the gob pile. However, before final placement and compaction of gob in the footprint of the east drying area, an underdrain will be installed. Approval of the underdrain design was incorporated into the permit under Technical Revision No. 105.

At gob pile #2, the first bench east of the haul road is covered with soil. The second bench east of the haul road is mostly covered with a subsoil pile. Most of the third and fourth benches east of the road are covered with soil. Soil has been placed on most of the second and third benches west of the haul road.

There was no coal mine waste was generated from the preparation plant during the quarter. Coal mine waste is to be placed in the piles in approximately horizontal lifts no more than 24-inches thick. The coal mine waste is dried and then spread and compacted by self propelled sheepsfoot compactors. There were seven compaction tests were taken at gob pile #3 during the quarter. There were no compaction tests taken at gob pile #2 during the quarter.

The top of gob pile #2 can serve as a drying area for end dumped gob, however, no gob is currently stockpiled on top of the pile. Gob is to be stacked to a maximum height of 20 feet, with a slope angle up to 1.5h:1v. A 25-foot buffer zone on the face of the gob pile will be maintained at all times. Gob will be spread and compacted to the currently approved slope configuration as soon as gob and weather conditions allow.

The westernmost and easternmost sections of gob pile #3 serve as drying areas for end dumped material. The purpose of the gob drying area is to provide an area for temporary storage of gob for drying purposes. End-dumped gob in the gob drying areas is worked with dozers and track hoes to assist in the drying process. There was no work at gob pile #3 during the inspection although placement and compaction efforts have occurred during the second quarter.

During active mining conditions, it is necessary to stockpile gob material at gob pile #3 during the winter months, then place and compact the stockpiled gob when weather allows. Stockpiling of gob can commence November 15 and end April 15. Winter stockpiled material will be re-handled and compacted by September 30. Beginning on October 1, the Operator should be compacting all material concurrently, until conditions again require stockpiling. The stockpiling dates listed above should be considered flexible and may change slightly from year to year based on weather conditions. The gob material will be stockpiled in rows generally running from northwest to southeast. The rows of gob will be placed in a controlled manner and overlap will be minimized so there is space between rows to allow for drainage to the southeast. Windrows were located on top of the pile and contained gob that had been hauled out of the west drying area.

The available volume of coverfill material is sufficient to meet the requirements of Rule 4.10.4(5). No coverfill was used for blending or other uses during the quarter.

A failure of the gob pile no. 1 would probably not be a hazard to human life. The pile is located above a large flat bench. The bench is approximately 80 to 150-feet wide directly below the pile. Additionally, the gob pile sediment pond is located below the pile. If the coal mine waste bank failed, the material would very likely be contained on the bench below the pile and or within the gob pile sediment pond.

A failure of gob pile no. 2 would probably not be a hazard to human life. A residential dwelling is located over 300-feet below pile no. 2. The piles are located above Bowie Road. A failure of the piles might damage Bowie Road and the Fire Mountain Canal but would not likely impact the residential dwelling.

A failure of gob pile no. 3 would not be a hazard to human life. A failure of the pile might damage the rail track below the pile. A small slip/slide occurred in February on the southern edge of the pile, no offsite damage occurred. The road at the toe of the pile was covered with gob making it inaccessible to vehicles.

I certify that to the best of my knowledge and belief, that the fill and other aspects of the coal mine waste banks have been constructed as permitted in the design approved by the DRMS.



7.18.19  
Date

Tamme Bishop  
Colorado Professional Engineer  
Registration No. 43402



**Huddleston-Berry**  
Engineering & Testing, LLC

2789 Riverside Parkway  
Grand Junction, Colorado 81501  
Phone: 970-255-8005  
Info@huddlestonberry.com

July 19, 2019  
Project#01349-0001

Bowie Resources, LLC  
43659 Bowie Road  
Paonia, Colorado 81428

Attention: Mr. Basil Bear

Subject: Summary of Instrumentation Monitoring  
2<sup>nd</sup> Quarter 2019  
Bowie Coal Waste Disposal Area No. 2  
Paonia, Colorado

Reference: *Summary of Instrumentation Monitoring, 1<sup>st</sup> Quarter 2019, Bowie Coal Waste Disposal Area No. 2, Paonia, Colorado* by Huddleston-Berry Engineering & Testing, LLC for Bowie Resources, LLC, April 16, 2019.

*Stability Evaluation, Technical Revision #85, Gob Pile #2 Drying Area, Bowie No. 2 Mine* by Huddleston-Berry Engineering & Testing, LLC for Bowie Resources, LLC, June 3, 2014.

Dear Mr. Bear,

At the request of the Colorado Division of Reclamation, Mining and Safety (DRMS), Huddleston-Berry Engineering & Testing, LLC (HBET) prepared this letter regarding quarterly monitoring of vibrating wire piezometers and inclinometers at Coal Waste Disposal Area No. 2 (CWDA No. 2) at the Bowie mine near Paonia, Colorado. The intent of the monitoring was to detect significant changes in the pore water pressures or significant displacements within the coal waste which may impact the stability of the waste pile.

### **Inclinometers**

In 2005, three inclinometers, designated BG05-04, BG05-05, and BG05-07, were installed at CWDA No. 2 through the coal refuse and into the native foundation soils. The inclinometers have been monitored quarterly since August 2005. The 2<sup>nd</sup> Quarter 2019 monitoring was completed by DOWL on June 14<sup>th</sup>, 2019. The monitoring report prepared by DOWL includes a site plan showing the locations of the inclinometers and cumulative displacement curves relative to the baseline readings in 2005. Axis "A" reflects deformation with depth in the direction of anticipated movement perpendicular to the face of the gob. Axis "B" reflects deformation with depth parallel to the face of the gob.

**Discussion of Inclinometer Monitoring**

The latest inclinometer readings show a slight deflection near the top of BG05-5. However, the deflection is perpendicular to the slope direction. As a result, the reported deflection is not an indication of instability. In addition, the 3<sup>rd</sup> Quarter 2019 monitoring will provide an indication of whether or not the observed deflection reflects actual movement or is simply a measurement error. No significant movements were reported for the other inclinometers.

**Vibrating Wire Piezometers**

Between 2005 and 2012, a total of ten vibrating wire piezometers were installed in CWDA No. 2. However, several of the piezometers have been damaged or have otherwise ceased to function. Currently, five of the piezometers are functional.

Monitoring of the functioning piezometers was completed by DOWL June 14<sup>th</sup>, 2019. The attached monitoring report prepared by DOWL includes the piezometer monitoring data and the data is summarized in the following table.

VWP ID	Initial Pore Pressure (psi)	03/28/19 Pore Pressure (psi)	06/14/19 Pore Pressure (psi)	Difference Since Installation (psi)	Difference Since Last Reading (psi)
VWP-05	6.8	1.7	1.5	-5.3	-0.2
VWP-06	11.3	12.6	12.2	+0.9	-0.4
VWP-08	8.2	9.3	8.9	+0.7	-0.4
VWP-09	2.8	2.8	2.8	0.0	0.0
VWP-10	-1.9	-1.8	-1.8	+0.1	0.0

**Discussion of Vibrating Wire Piezometers**

VWP-05

VWP-05 was installed on August 3, 2005 near the toe of CWDA No. 2 adjacent to the access road/bench. The pore pressures recorded at VWP-05 have shown some seasonal fluctuations; however, the range of pore pressure changes is fairly small. In general, HBET does not believe that the pore pressures in VWP-05 are cause for concern regarding stability of the gob pile.

VWP-06

VWP-06 was installed on June 5, 2009 near the existing top of CWDA No. 2. The pore pressures recorded at VWP-06 have fluctuated since installation. In general, the fluctuations have been seasonal and reflect the level of coal mine waste placement activity on top of CWDA No. 2. In general, HBET does not believe that the measured pore pressures are an indication of any instability in CWDA No. 2.

VWP-08

VWP-08 was installed on June 5, 2009 at a slightly lower elevation than VWP-06. The pore pressures recorded at VWP-08 have fluctuated since installation. However, the fluctuations have generally been within a narrow range of values. The measured pore pressures are generally consistent with the level of coal mine waste placement activity at CWDA No. 2.

As indicated in the referenced *Stability Evaluation* report, the stability of CWDA No. 2 is sensitive to increases in pore pressures in VWP-08. An increase in the pore pressure of 7 psi in VWP-08 would result in a reduction of the Factor of Safety to below 1.5.

The current pore pressure reflects a piezometric surface elevation of approximately 6096 feet which is much less than the critical elevation of 6113 feet. As a result, HBET does not believe that the measured pore pressures in VWP-08 are any indication of instability in CWDA No. 2.

VWP-09

VWP-09 was installed on May 18, 2012 near the toe of CWDA No. 2. The pore pressures recorded at VWP-09 have been fairly steady since installation. This suggests that dewatering of the gob in this area is likely nearly complete. It is anticipated that the pore pressures at VWP-09 will remain fairly steady over time.

VWP-10

VWP-10 was installed on May 18, 2014 near the toe of CWDA No. 2. The pore pressures recorded at VWP-10 have been fairly steady since installation. This suggests that dewatering of the gob in this area is likely nearly complete. It is anticipated that the pore pressures at VWP-10 will remain fairly steady over time.

General

In general, based upon the results of the recent VWP and inclinometer monitoring data, HBET does not believe that there is any reduction in the stability of CWDA No. 2. Due to the limited activity at the mine, HBET recommends that the monitoring frequency be reduced to semi-annually.

We are pleased to be of service to your project. Please contact us if you have any questions or comments regarding the contents of this report.

Respectfully Submitted:

**Huddlestone-Berry Engineering and Testing, LLC**



Michael A. Berry, P.E.  
Vice President of Engineering

June 26, 2019

Mike Berry  
 Huddleston-Berry Engineering and Testing, LLC  
 640 White Avenue  
 Grand Junction, CO 81501

**SUBJECT: Summary Report, 2nd Quarter 2019, Inclinometer and Active Vibrating Wire Piezometer Data April – June 2019, Bowie Mine #2 Coal Waste Disposal Area (CWDA) #2**

Dear Mr. Berry:

DOWL conducted quarterly monitoring of inclinometers and vibrating wire piezometers (VWP) at Coal Waste Disposal Area #2 (CWDA #2), Bowie Resources, LLC. This report is intended to cover the period of April through June 2019. VWP and inclinometer data was recorded on 6/14/19. Per CDRMS and your instructions, vibrating wire piezometer and inclinometer readings for all active instruments are taken quarterly.

**Vibrating Wire Piezometers**

The physical locations of the piezometers are shown on the attached Instrumentation Site Plan (Map 1). As seen on this map, five of the original VWP's were damaged and some were replaced. Currently, there are five active VWP's and three of them are adjacent to the three inclinometers. The graph of historical data from 5/16/05 through 5/21/14 is presented for reference as Figure 1. A graph of measured pore pressures of active piezometers is presented on the attached Figure 2 and is presented numerically in Table 1 below.

**Table 1. Summary of VWP Pore Pressure Readings**

VWP ID #	Installation Pore Pressure (psi)	3/28/19 (Q1) Pore Pressure (psi)	6/14/19 (Q2) Pore Pressure (psi)	Difference Since Installation (psi)	Difference Since Last Quarter (psi)
VWP-05	6.8	1.7	1.5	-5.3	-0.2
VWP-06	11.3	12.6	12.2	0.9	-0.4
VWP-08	8.2	9.3	8.9	0.7	-0.4
VWP-09	2.8	2.8	2.8	0.0	0.0
VWP-10	-1.9	-1.8	-1.8	0.1	0.0

As seen on Figure 2, the VWP readings are consistent either with previous recent or historic readings. Pore pressure readings went down slightly in three piezometers and stayed the same in two piezometers when compared to the Q1 readings.

### **Inclinometers**

Three inclinometers, designated BG05-4, BG05-5, and BG05-7, were installed at CWDA #2 in August 2005. The inclinometers were installed through the coal refuse and approximately 20 feet into the native foundation soils. The physical locations of the inclinometers are shown on the attached Instrumentation Site Plan (Map 1). Baseline readings were taken on 8/10/05 and subsequent readings have generally been taken quarterly since that time. Displacement curves for each of the three inclinometers for the current and the prior three readings are presented as attachments to this letter in Figure 3. Axis "A" reflects deformation with depth in the direction of anticipated movement (downslope), while Axis "B" is orthogonal to Axis A.

As described in previous reports, we believe historic displacements indicated on the plots for the approximate upper ten feet of the inclinometers are likely due to placement of cover soil on the face of the waste pile during normal operations for maintenance and revegetation. Recent downslope readings (Axis A) are generally consistent with previous readings. There appears to be a small displacement in the orthogonal direction (Axis B) for inclinometer BG05-5B above 14 feet. This is not as concerning since it is not in the downslope direction and likely relates to the casing being bumped by movement of cover soil or by a recording error. This discrepancy of less than 1/4-inch laterally should be evaluated during the next (Q3) reading.

If you have any questions regarding this letter or the instrumentation monitoring at CWDA #2, please contact me at (907) 562-2000 or [jholland@dowl.com](mailto:jholland@dowl.com).

Respectfully Submitted,  
**DOWL**



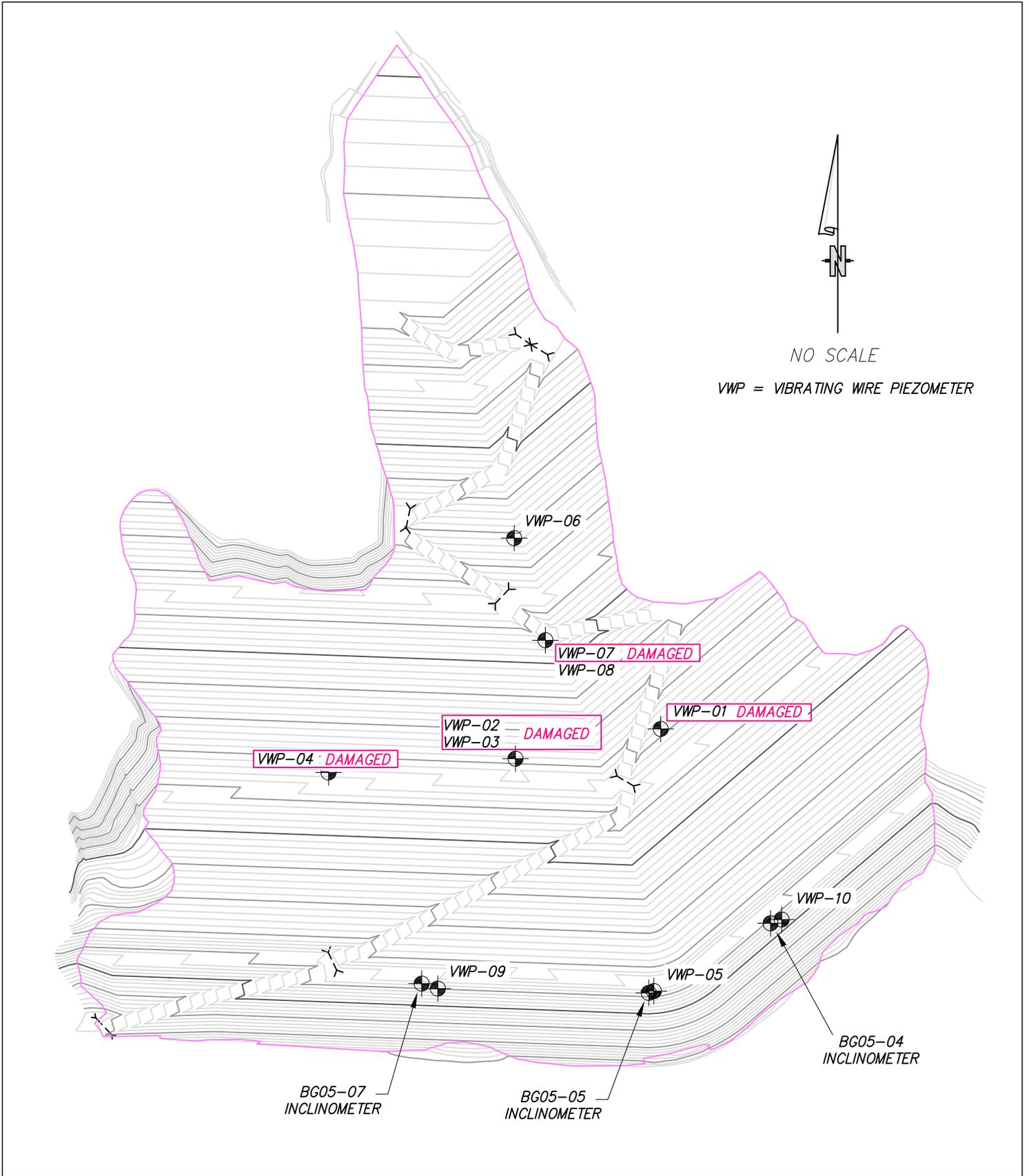
Jeremiah E. Holland, P.E.  
Geotechnical Engineer



LJB/JEH

Enclosures: Map 1 – Instrumentation Location Plan  
Figure 1 – Active and Damaged Piezometer Data Graph (2005-2014)  
Figure 2 – Active Vibrating Wire Piezometer Data Graph (to present)  
Figure 3 – Inclinometer Displacement Curves

# INSTRUMENTATION SITE PLAN



<b>Map</b>  1  OF 1		<b>Huddleston-Berry</b> BOWIE #2 GOB PILE DELTA COUNTY, COLORADO	 WWW.DOWL.COM 222 South Park Avenue Montrose, Colorado 81401 970-249-6828
	DATE	2017	
	JOB NO.	7131.74699.01	

# Figure 1 - Bowie Mine #2 - CWDA #2 Active and Damaged Vibrating Wire Piezometer Data

Inception (5/16/05) through 5/21/14

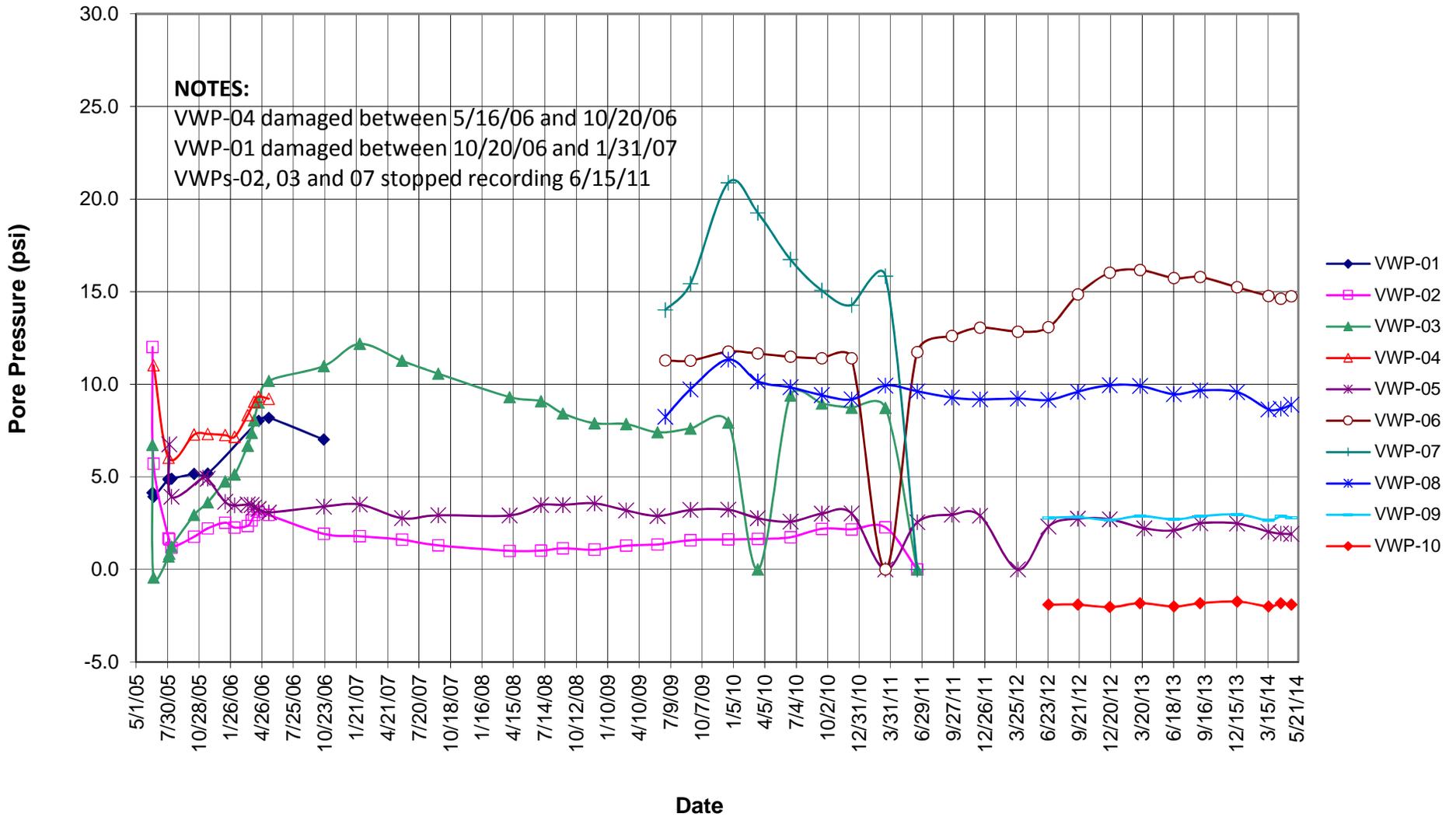
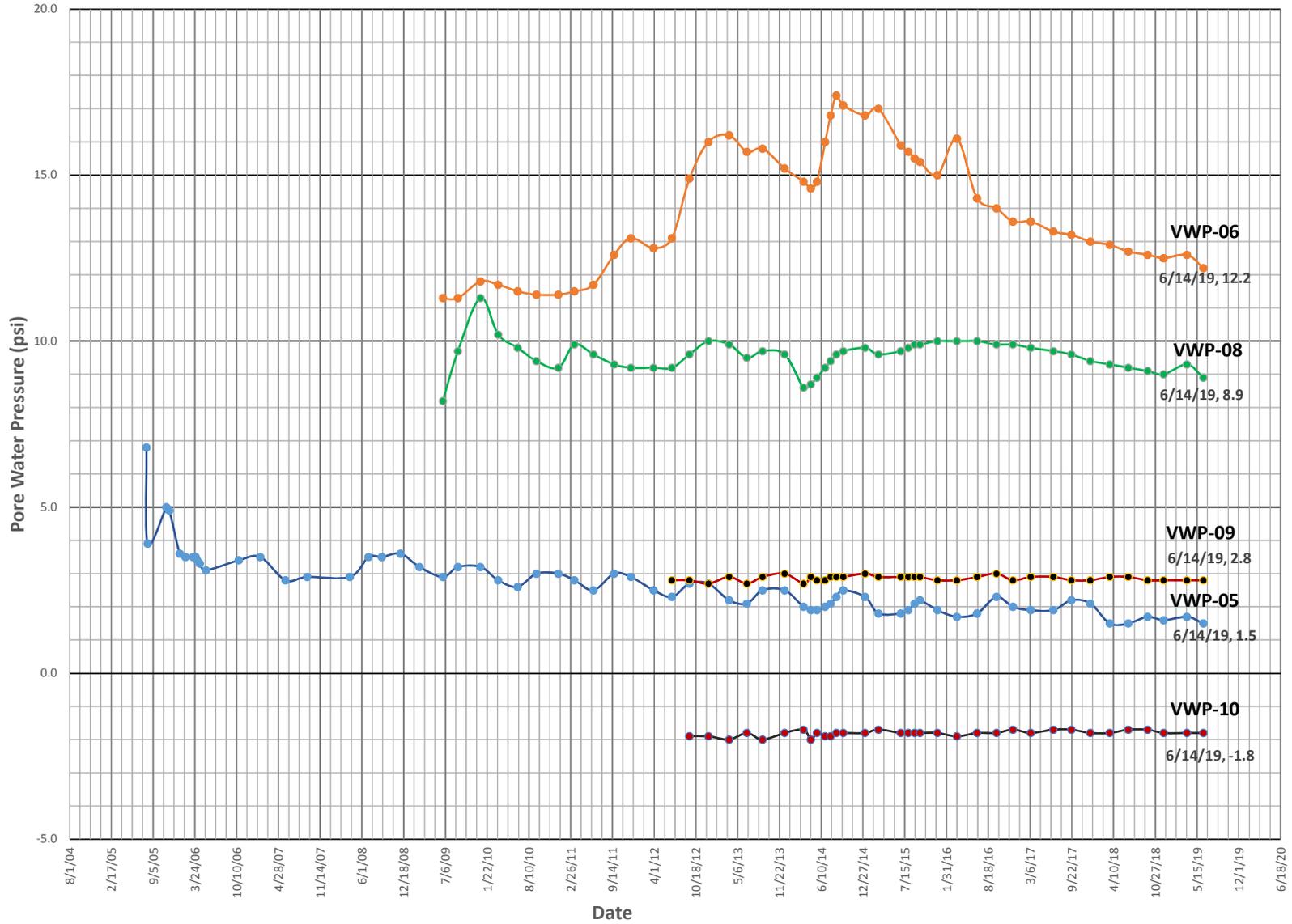


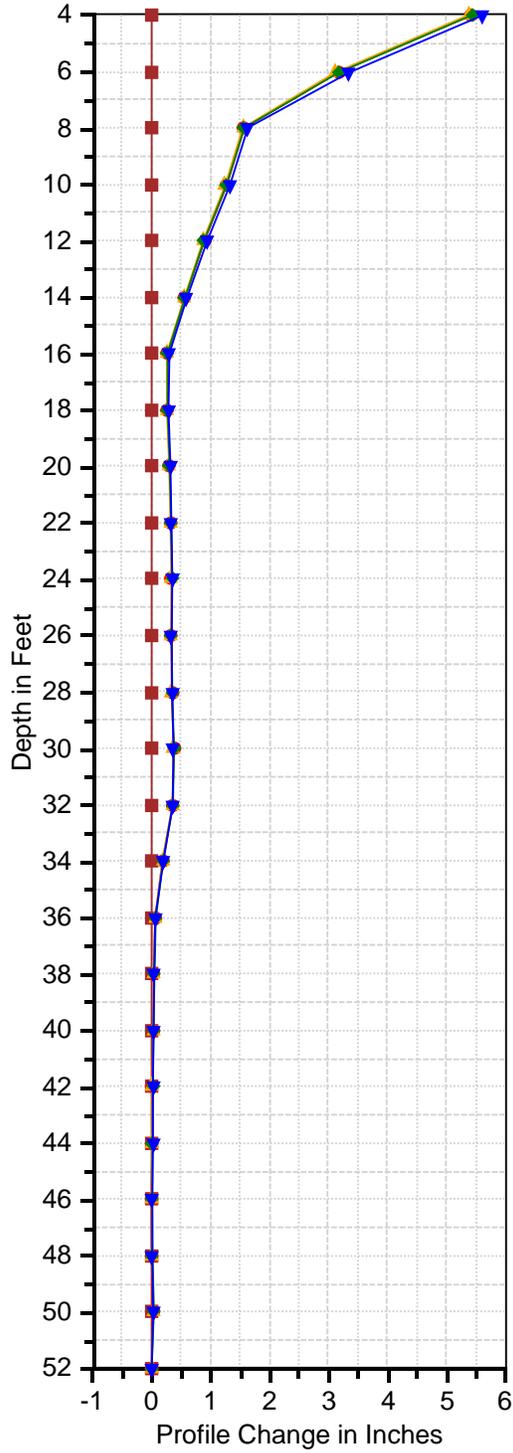
Figure 2 - Bowie Mine #2 - CWDA #2  
Active Vibrating Wire Piezometer Data



# Figure 3 - Inclinator Displacement Curves

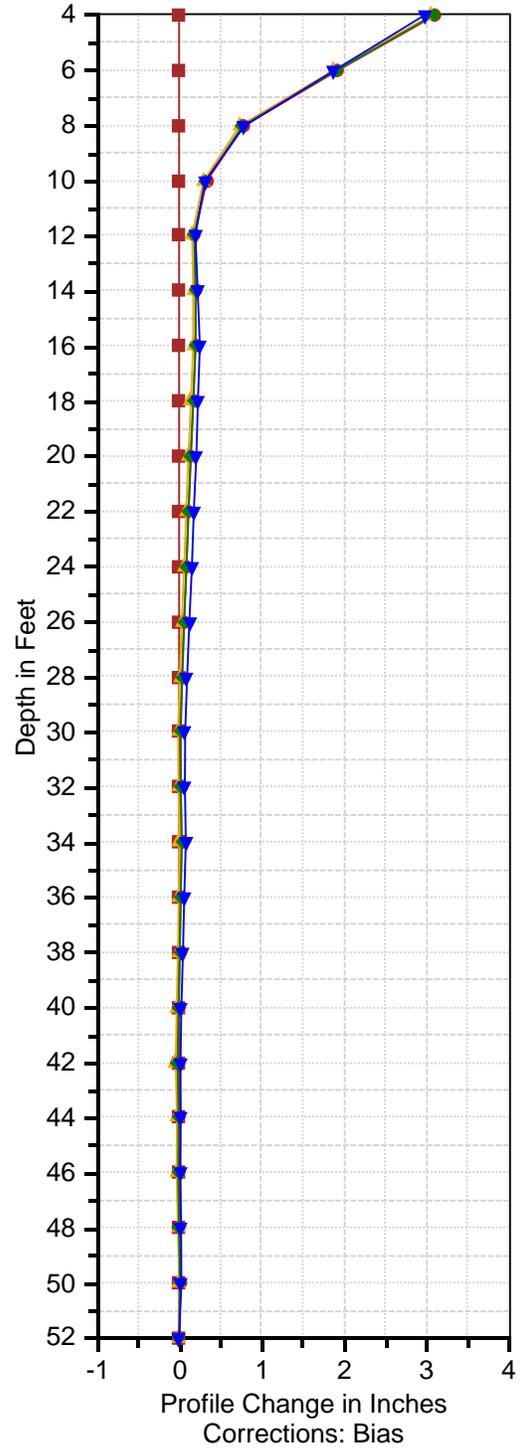
## BOWIE BG05\_4 A

■ 8/10/2005    ● 9/21/2018    ▲ 12/6/2018  
◆ 3/28/2019    ▼ 6/15/2019



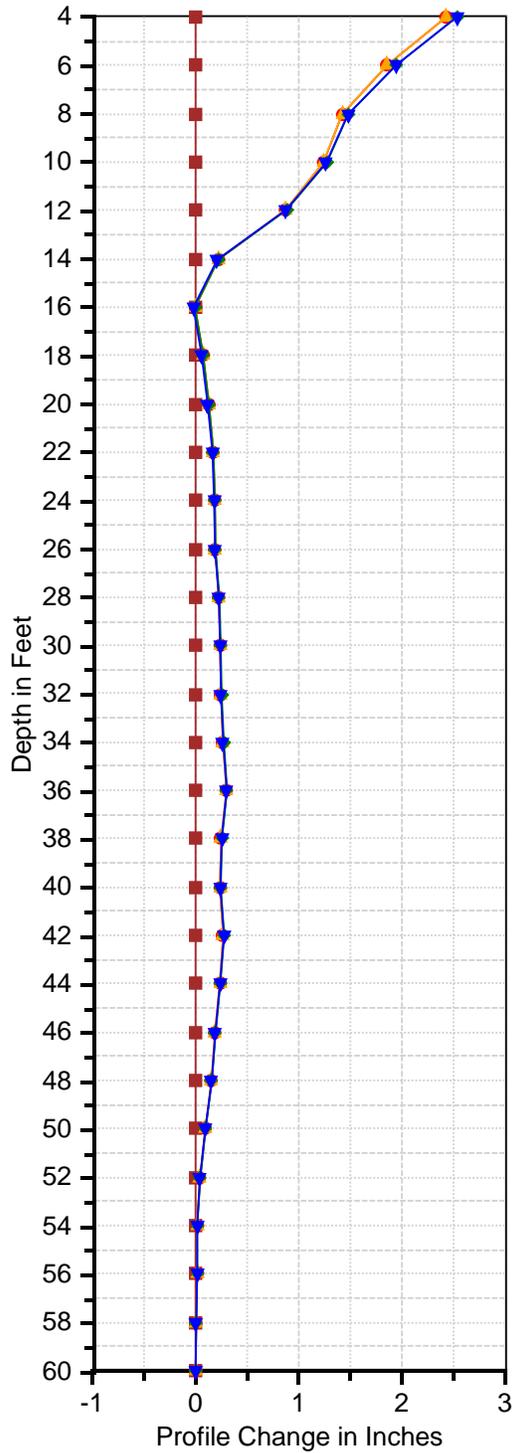
## BOWIE BG05\_4 B

■ 8/10/2005    ● 9/21/2018    ▲ 12/6/2018  
◆ 3/28/2019    ▼ 6/15/2019



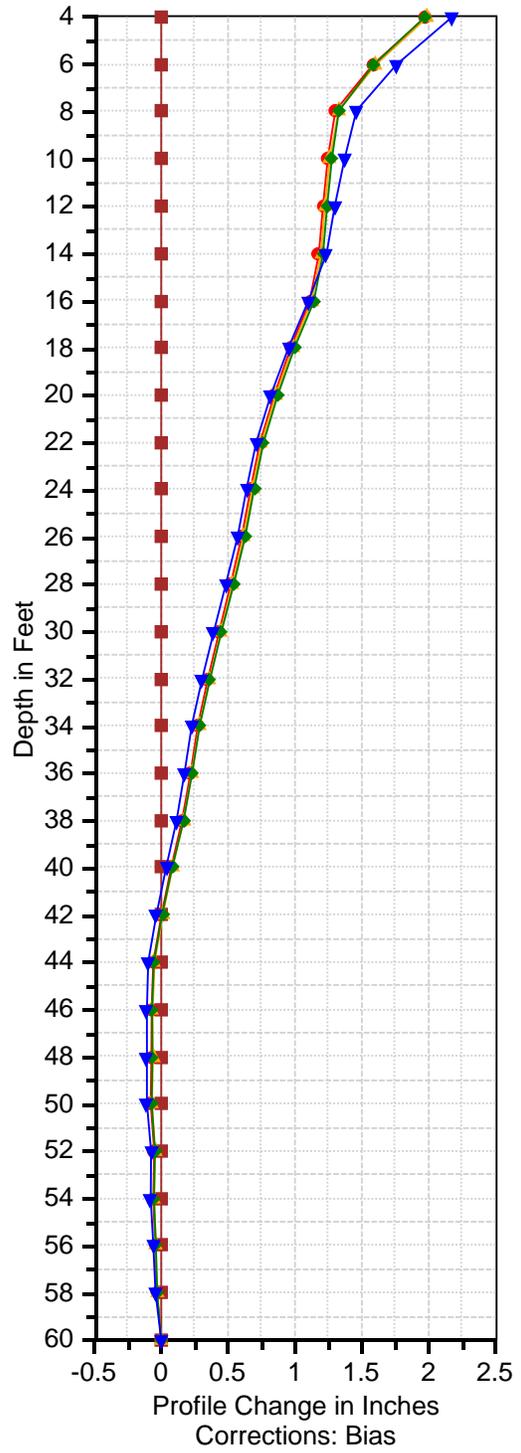
BOWIE BG05\_5 A

8/10/2005 12/6/2018 1/6/2019  
 3/28/2019 6/15/2019



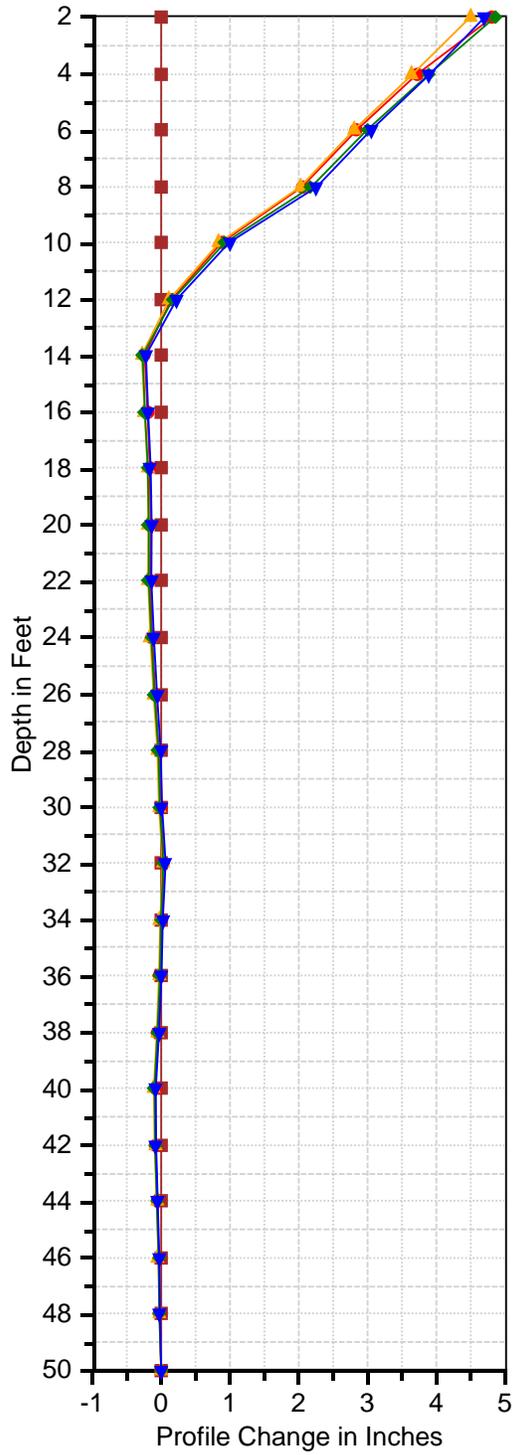
BOWIE BG05\_5 B

8/10/2005 9/21/2018 12/6/2018  
 3/28/2019 6/15/2019



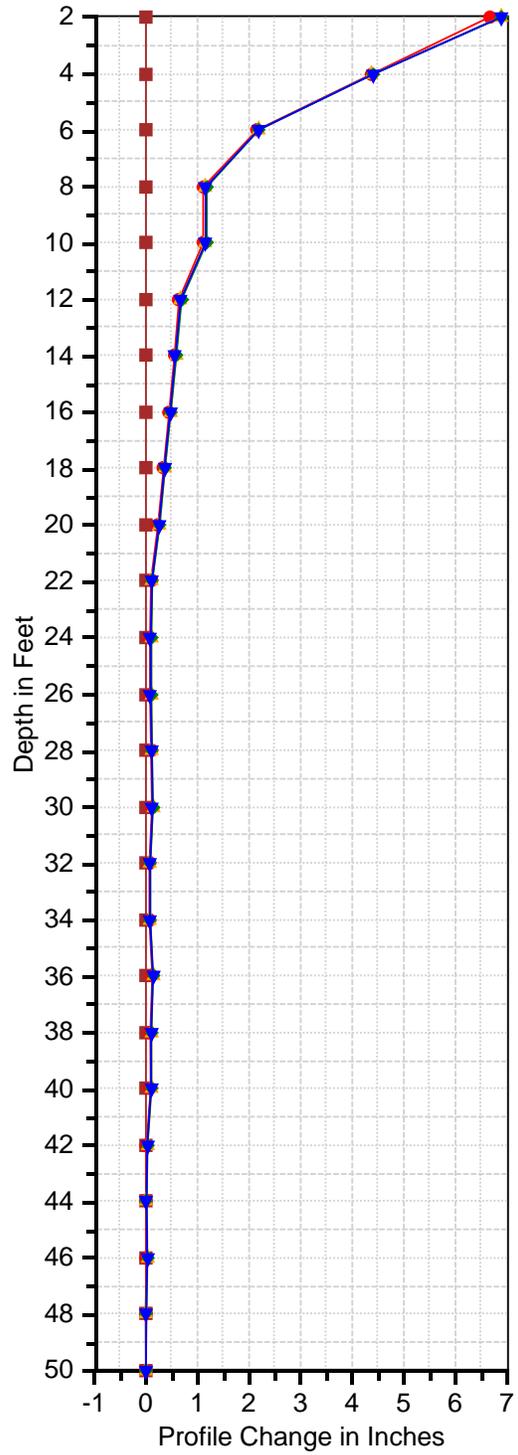
BOWIE BG05\_7 A

8/10/2005 9/21/2018 12/6/2018  
3/28/2019 6/15/2019



BOWIE BG05\_7 B

8/10/2005 9/21/2018 12/6/2018  
3/28/2019 6/15/2019





**Huddleston-Berry**  
Engineering & Testing, LLC

2789 Riverside Parkway  
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[Info@huddlestonberry.com](mailto:info@huddlestonberry.com)

July 19, 2019  
Project#01349-0001

Bowie Resources, LLC  
43659 Bowie Road  
Paonia, Colorado 81428

Attention: Mr. Basil Bear

Subject: Summary of Instrumentation Monitoring  
2<sup>nd</sup> Quarter 2019  
Bowie Coal Waste Disposal Area No. 3  
Paonia, Colorado

Reference: *Summary of Instrumentation Monitoring, 1<sup>st</sup> Quarter 2019, Bowie Coal Waste Disposal Area No. 3, Paonia, Colorado* by Huddleston-Berry Engineering & Testing, LLC for Bowie Resources, LLC, April 16, 2019.

*Stability Evaluation, Gob Pile #3, Bowie No. 2 Mine* by Huddleston-Berry Engineering & Testing, LLC for Bowie Resources, LLC, July 15, 2014.

Dear Mr. Bear,

At the request of the Colorado Division of Reclamation, Mining and Safety (DRMS), Huddleston-Berry Engineering & Testing, LLC (HBET) prepared this letter regarding quarterly monitoring of vibrating wire piezometers at Coal Waste Disposal Area No. 3 (CWDA No. 3) at the Bowie mine near Paonia, Colorado. The intent of the monitoring was to detect significant changes in the pore water pressures within the coal waste which may impact the stability of the waste pile.

### **Vibrating Wire Piezometers**

Five vibrating wire piezometers were installed in CWDA No. 3 in October 2014. The piezometers were installed at three locations within the footprint of the gob pile. Monitoring of the functioning piezometers was completed by DOWL on June 14<sup>th</sup>, 2019. The attached monitoring report prepared by DOWL includes the piezometer monitoring data and the data is summarized in the following table.

VWP ID	Initial Pore Pressure 10/31/14 (psi)	03/28/19 Pore Pressure (psi)	06/14/19 Pore Pressure (psi)	Difference Since Installation (psi)	Difference Since Last Reading (psi)
VWP-A Deep	10.4	3.8	5.2	-5.2	+1.4
VWP-A Shallow	4.7	3.5	3.4	-1.3	-0.1
VWP-B Deep	0.2	1.2	1.0	+0.8	-0.2
VWP-B Shallow	13.9	10.6	9.7	-4.2	-0.9
VWP-D	7.1	5.4	5.1	-2.0	-0.3

## **Discussion of Vibrating Wire Piezometers**

### **VWP-A Deep**

VWP-A Deep was installed on October 6, 2014 near the northern edge of CWDA No. 3. VWP-A Deep was installed in the foundation soil approximately eight feet below the bottom of the gob. The pore pressures recorded at VWP-A Deep generally decreased since installation until September 2015. After that, the pore pressures fluctuated within a narrow range until the latest reading which showed an increase. However, HBET does not believe that the recent increase in pore pressures in VWP-A Deep are cause for concern regarding stability of CWDA No. 3.

### **VWP-A Shallow**

VWP-A Shallow was installed on October 6, 2014 near the northern edge of CWDA No. 3. VWP-A Shallow was installed approximately ten feet above the base of the gob. After installation, the pore pressures dropped until November 2014. Between November 2014 and September 2015, increases in the pore pressures were recorded at VWP-A Shallow. However, between September 2015 and December 2016, the pore pressures decreased. Since then, the data have fluctuated within a narrow range. In general, HBET does not believe that the pore pressure changes in VWP-A Shallow are an indication of instability in CWDA No. 3.

### **VWP-B Deep**

VWP-B Deep was installed on October 6, 2014 in the west-central portion of CWDA No. 3. VWP-B Deep was installed in the foundation soil approximately ten feet below the bottom of the gob. Since installation, the pore pressures recorded at VWP-B Deep have fluctuated within a narrow range. The previous quarter showed an increase in pore pressure; however, the current quarter showed a decrease. In general, HBET does not believe that the pore pressure changes in VWP-B Deep are an indication of instability in CWDA No. 3

### **VWP-B Shallow**

VWP-B Shallow was installed on October 6, 2014 in the west-central portion of CWDA No. 3. VWP-B Shallow was installed approximately ten feet above the base of the gob. Since installation, the pore pressures recorded at VWP-B Shallow have fluctuated with periods of slight increase and slight decrease. In general, HBET does not believe that the pore pressure changes in VWP-B Shallow are an indication of instability in CWDA No. 3.

### **VWP-D**

VWP-D was installed on October 7, 2014 in the east-central portion of CWDA No. 3. VWP-D was installed approximately ten feet above the base of the gob. Since installation, the pore pressures recorded at VWP-D have fluctuated. The pore pressures increase slightly during the 3<sup>rd</sup> Quarter of 2017. However, this likely reflects the activity at CWDA No. 3 during the monitoring period and the pore pressures have decreased since September 2017. In general, HBET does not believe that the pore pressure changes in VWP-D are an indication of instability in CWDA No. 3.

**General**

Based upon the results of the most recent VWP monitoring data, HBET does not believe that there is any reduction in the stability of CWDA No. 3.

We are pleased to be of service to your project. Please contact us if you have any questions or comments regarding the contents of this report.

Respectfully Submitted:  
**Huddlestone-Berry Engineering and Testing, LLC**



Michael A. Berry, P.E.  
Vice President of Engineering

**ATTACHMENTS**

June 26, 2019

Mike Berry  
 Huddleston-Berry Engineering and Testing, LLC  
 640 White Avenue  
 Grand Junction, CO 81501

**SUBJECT: Summary Report, 2nd Quarter 2019, Vibrating Wire Piezometers  
 April – June 2019, Bowie Mine #2  
 Coal Waste Disposal Area (CWDA) #3**

Dear Mr. Berry,

DOWL conducted quarterly monitoring of installed vibrating wire piezometers at Coal Waste Disposal Area #3 (CWDA #3), Bowie Resources, LLC. This report is intended to cover the period of April through June 2019 (2<sup>nd</sup> Quarter). VWP data was recorded on 6/14/19. Per CDRMS and your instructions, vibrating wire piezometer readings for all active piezometers are taken quarterly.

A graph of measured pore pressures is presented on the attached Figure 1 and numerically in Table 1 below. Table 1 summarizes the initial, prior and current readings and the difference in individual pore pressures since installation and previous quarterly readings.

**Table 1. Summary of Pore Pressure Readings**

VWP ID #	10/31/14 Installation Pore Pressure (psi)	3/28/18 Pore Pressure (psi)	6/14/19 Pore Pressure (psi)	Difference Since Installation (psi)	Difference Since Last Quarter (psi)
VWP-A Deep	10.4	3.8	5.2	-5.2	1.4
VWP-A Shallow	4.7	3.5	3.4	-1.3	-0.1
VWP-B Deep	0.2	1.2	1.0	0.8	-0.2
VWP-B Shallow	13.9	10.6	9.7	-4.2	-0.9
VWP-D	7.1	5.4	5.1	-2.0	-0.3

As seen on Figure 1, the readings are either consistent with previous recent or historic readings. Only one piezometer (VWP-A Deep) had a pore pressure increase since the 1<sup>st</sup> quarter, but this VWP has showed the most erratic readings of all the piezometers since installation. The other four VWP's had variable amounts of pore pressure decreases. If you have any questions regarding this letter or the instrumentation monitoring at CWDA #3, please contact me at (907) 562-2000 or [jholland@dowl.com](mailto:jholland@dowl.com).

Respectfully Submitted,  
**DOWL**



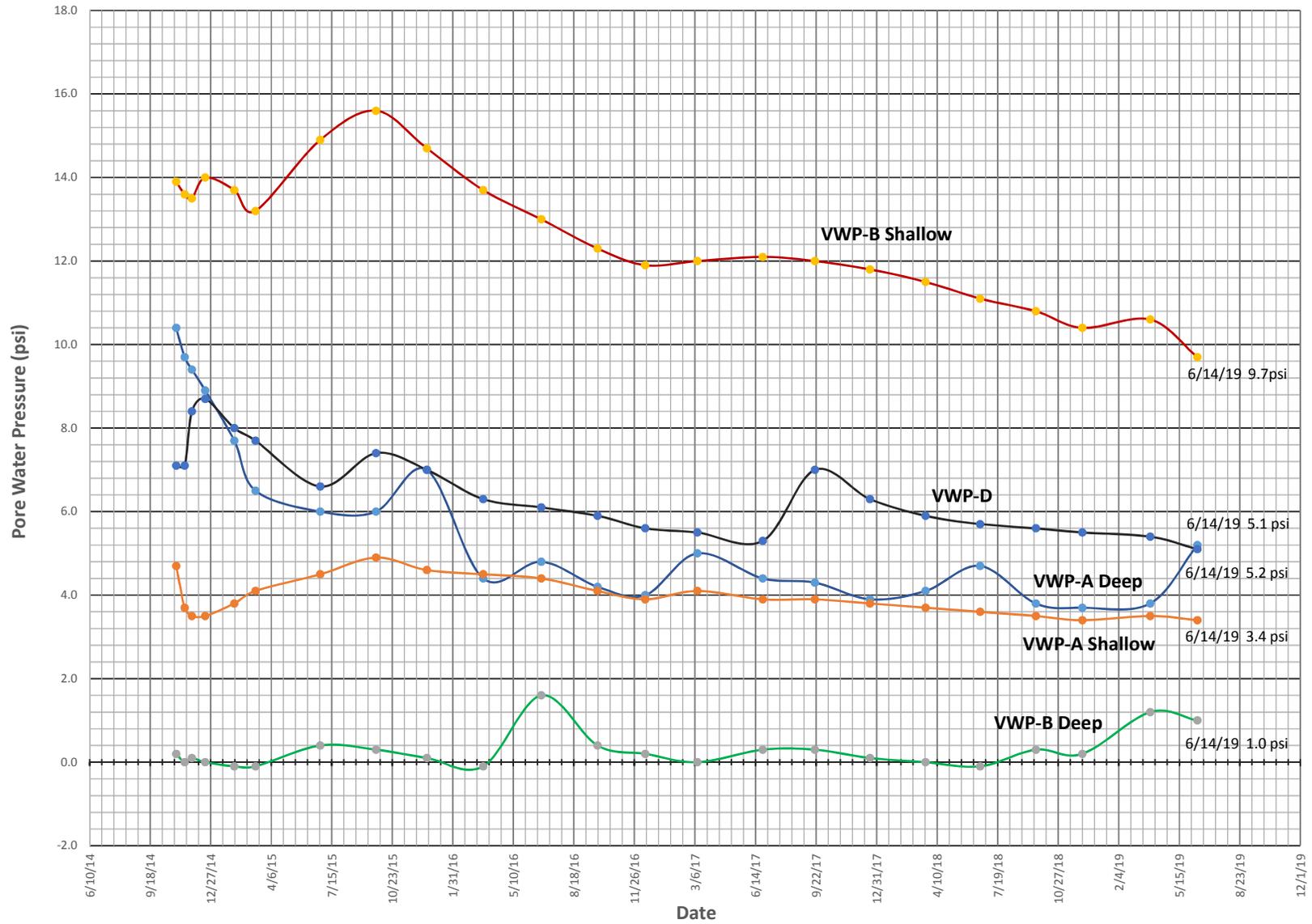
Jeremiah E. Holland, P.E.  
Geotechnical Engineer



LJB/JEH

Enclosure: Figure 1 – Vibrating Wire Piezometer Data Graph

Figure 1 - Bowie Mine #2 - CWDA #3  
Vibrating Wire Piezometer Data





**Huddleston-Berry**  
Engineering & Testing, LLC

2789 Riverside Parkway  
Grand Junction, Colorado 81501  
Phone: 970-255-8005  
Info@huddlestonberry.com

July 23, 2019  
Project#01349-0001

Bowie Resources, LLC  
43659 Bowie Road  
Paonia, Colorado 81428

Attention: Mr. Basil Bear

Subject: Construction Materials Testing  
2<sup>nd</sup> Quarter 2019  
Bowie Mine No. 2  
Paonia, Colorado

Dear Mr. Bear,

At your request, a representative of Huddleston-Berry Engineering and Testing, LLC (HBET) conducted field moisture and compaction testing, and laboratory moisture testing of coal mine waste materials placed at Bowie Mine No. 2 near Paonia, Colorado. Field testing was conducted on April 8<sup>th</sup>, 2019. Soil compaction test reports, test location data, and laboratory optimum moisture and density (Proctor) data are attached.

We are pleased to be of service to your project. Please contact us if you have any questions or comments regarding the contents of this report.

Respectfully Submitted:  
**Huddleston-Berry Engineering and Testing, LLC**

A handwritten signature in blue ink that reads "Michael A. Berry". The signature is written in a cursive style with a long, sweeping underline.

Michael A. Berry, P.E.  
Vice President of Engineering



# SOIL COMPACTION TEST REPORT

**Task:** Gob Pile Densities

## Field vs. Lab Densities

**Project No.:** 01349 - 0001

**Tested By:** MS **Date:** 4/8/19

**Project Name:** Bowie Mine

**Work Order No.:** 58194

**Client Name:** Bowie Resources

**Authorized By:** Client **Date:** 4/8/19

**Placement Contractor:** Bowie Resources

**Reviewed By:** MAB **Date:** 4/15/19

**Contractor Representative:** Ron

No.	Point No.	Elevation	Max. Dry Density (pcf)	Optimum Moisture (%)	Wet Density (pcf)	Speedy Moisture (%)	Field Dry Density (pcf)	Relative Field Comp.(%)	Tare Weight (g)	Wet Weight (g)	Dry Weight (g)	Lab Dry Density (pcf)	Lab Moisture (%)	Relative Lab Comp.(%)
1	424	5881.5	104.0	13.5	105.0				105.6	958.0	867.8	93.9	11.8%	90%
2	425	5883.6	104.0	13.5	105.8				154.6	629.2	580.2	94.9	11.5%	91%
3	426	5886.6	104.0	13.5	112.5				154.1	894.3	818.0	100.9	11.5%	97%
4	427	5895.2	104.0	13.5	107.0				224.5	950.6	857.9	93.3	14.6%	90%
5	428	5903.5	104.0	13.5	110.1				313.0	1430.3	1311.1	98.4	11.9%	95%
6	429	5910.8	95.5	14.0	105.3				323.3	772.4	710.3	90.7	16.0%	95%
7	430	5912.7	95.5	14.0	103.9				314.4	1020.9	937.6	91.6	13.4%	96%

**Remarks:** \_\_\_\_\_

Gob Pile # 3  
8-Apr-19

Point #	North	East	Elev.	Date	
424	17442.57	35856.11	5881.5	8-Apr	Lower Area
425	17461.77	35779.48	5883.6		
426	17536.15	35732.42	5886.6		
427	17279.51	35684.55	5895.2	8-Apr	Top of Gob Fill
428	17400.8	35667.63	5903.5		
429	17420.66	35576.93	5910.8		
430	17508.17	35576.07	5912.7		



Huddlestone-Berry Engineering & Testing, LLC  
640 White Avenue, Unit B  
Grand Junction, CO 81501  
970-255-8005  
970-255-6818

# MOISTURE-DENSITY RELATIONSHIP

CLIENT Bowie Resources, LLC

PROJECT NAME Bowie Mine #2

PROJECT NUMBER 00489-0003

PROJECT LOCATION Paonia, CO

Sample Date: \_\_\_\_\_  
Sample No.: 14-0195  
Source of Material: Gob #3 Borrow Blend  
Description of Material: \_\_\_\_\_  
Test Method: ASTM D698C

## TEST RESULTS

Maximum Dry Density 104.0 PCF  
Optimum Water Content 13.5 %

### GRADATION RESULTS (% PASSING)

#200                      #4                      3/4"

### ATTERBERG LIMITS

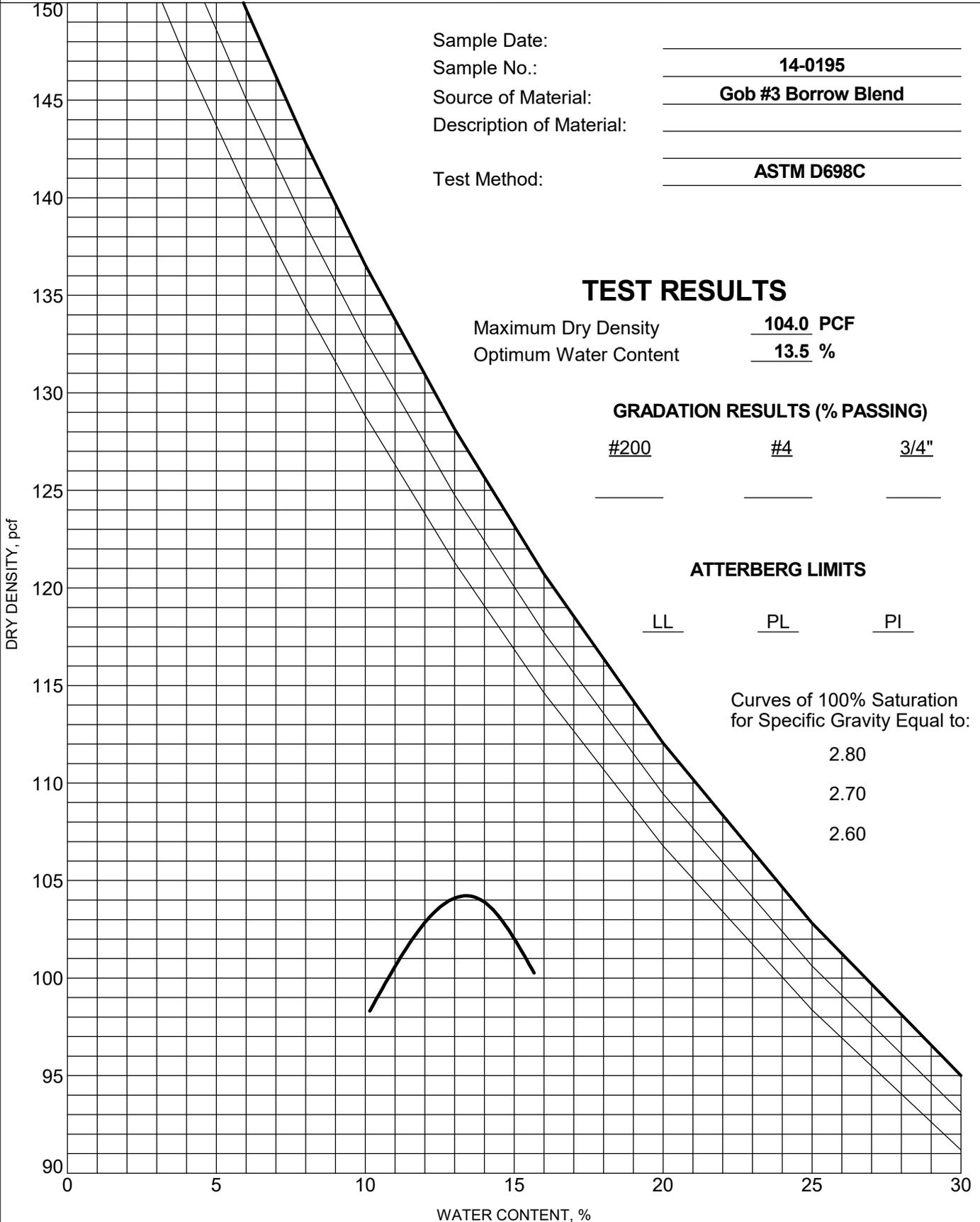
LL                      PL                      PI

Curves of 100% Saturation  
for Specific Gravity Equal to:

2.80

2.70

2.60



COMPACTION BOWIE MINE.GPJ GINT US LAB.GDT 10/11/17



Huddlestone-Berry Engineering & Testing, LLC  
 640 White Avenue, Unit B  
 Grand Junction, CO 81501  
 970-255-8005  
 970-255-6818

# MOISTURE-DENSITY RELATIONSHIP

CLIENT Bowie Resources, LLC

PROJECT NAME Bowie Mine #2

PROJECT NUMBER 00489-0003

PROJECT LOCATION Paonia, CO

Sample Date: 3/28/2015  
 Sample No.: 15-0116  
 Source of Material: Gob 3 03/28/15  
 Description of Material: SILTY SAND with GRAVEL(SM)  
 Test Method: ASTM D698C

## TEST RESULTS

Maximum Dry Density 95.5 PCF  
 Optimum Water Content 14.0 %

### GRADATION RESULTS (% PASSING)

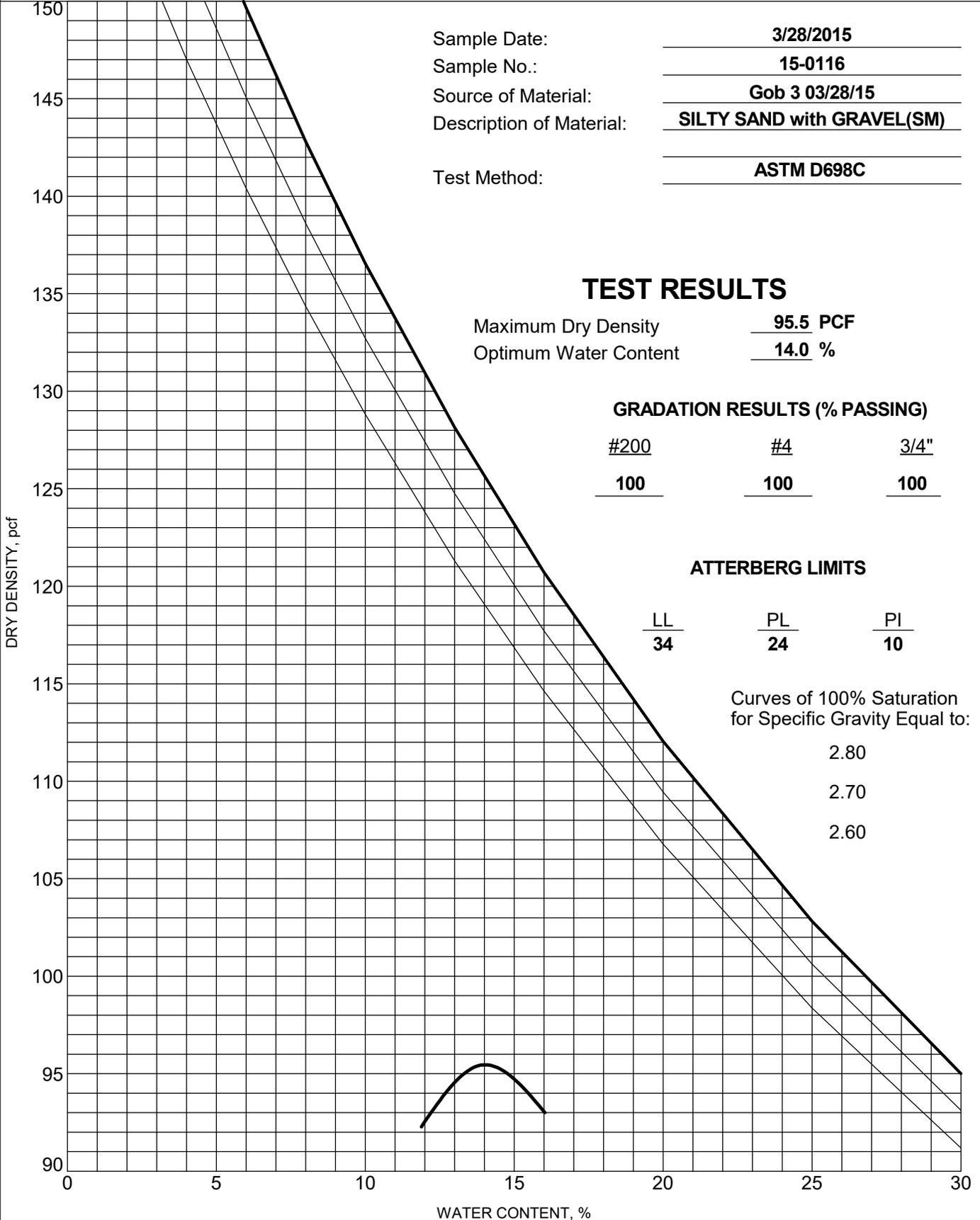
#200	#4	3/4"
<u>100</u>	<u>100</u>	<u>100</u>

### ATTERBERG LIMITS

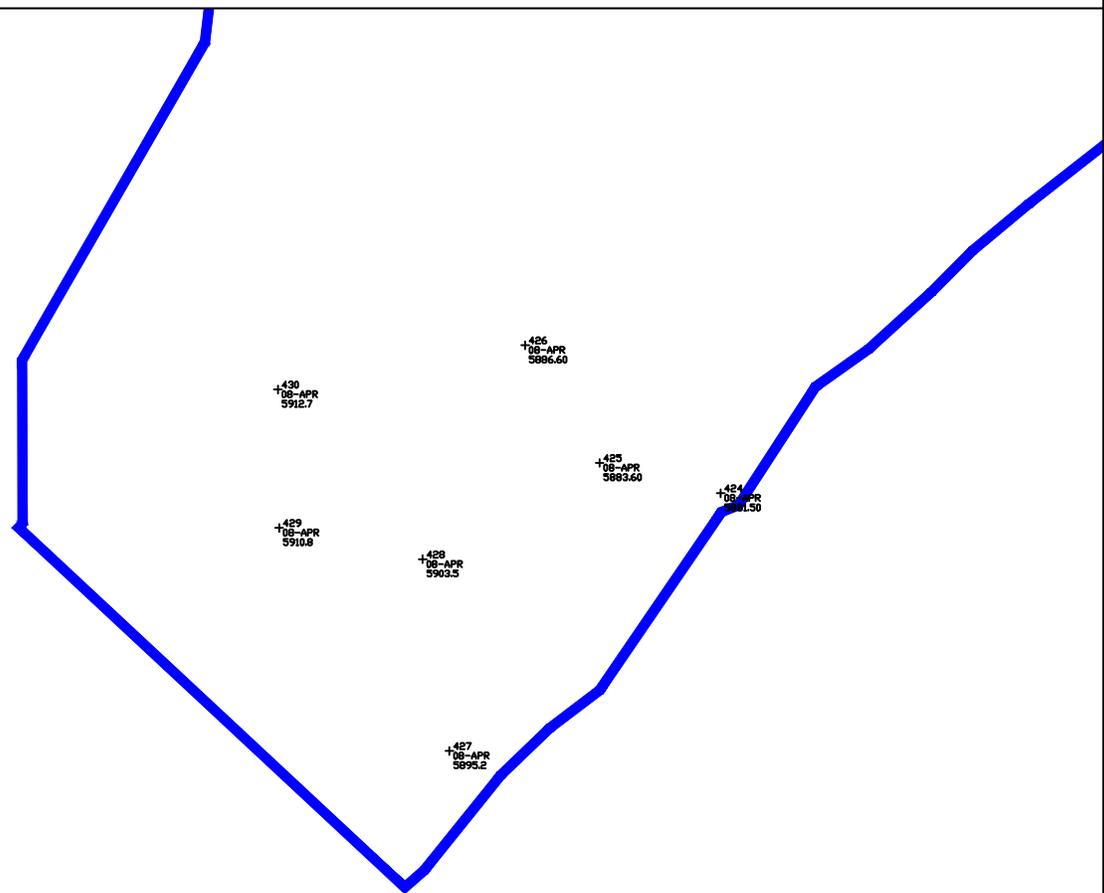
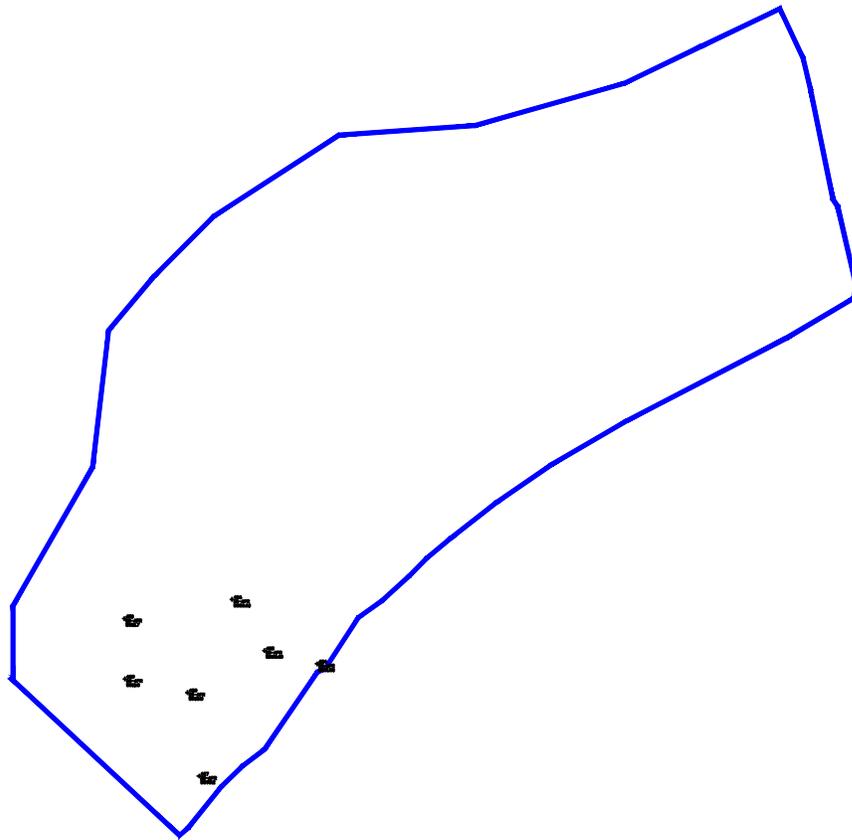
LL	PL	PI
<u>34</u>	<u>24</u>	<u>10</u>

Curves of 100% Saturation  
 for Specific Gravity Equal to:

2.80  
 2.70  
 2.60



COMPACTION BOWIE MINE.GPJ GINT US LAB.GDT 10/11/17



**GOB PILE #3  
COMPACTION TEST LOCATIONS**

PREPARED FOR:  
  
**BRL**  
 BOWIE RESOURCES, LLC

BOWIE RESOURCES, LLC  
 BOWIE NO. 2 MINE  
 P.O. BOX 483  
 PAONIA, COLORADO 81428

**GOB PILE #3  
04/08/19**

DESIGN BY:	DATE:	07/15/19
DRAWN BY:	J.E.S.	CHK'D BY:
SCALE:	NONE	
DIRECTORY:	D:\BOWIE	DWG. NAME:

J. E. STOVER & ASSOCIATES, INC.  
 2358 N 7th St. Unit B  
 Grand Jct., CO 81501