

J. E. STOVER & ASSOCIATES, INC.

2352 NORTH 7TH STREET, UNIT B
GRAND JUNCTION, COLORADO 81501
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MINE ENGINEERING
MINE RECLAMATION

CIVIL ENGINEERING
CONST. MANAGEMENT

Via Electronic Transmittal

July 17, 2018

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

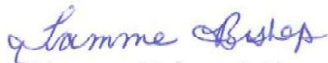
Re: Bowie Resources, LLC, Bowie No. 2 Mine
Coal Mine Waste Banks & Instrumentation Monitoring
Pond Quarterly Inspections
Permit C-1996-083

Dear Ms. Binns:

Enclosed please find the referenced reports for the 2nd quarter of 2018.

Please call if you have any questions.

Sincerely,



Tamme Bishop, P.E.
Project Engineer

cc: Wm. A. Bear, Jr.

QUARTERLY POND INSPECTION REPORT

Operator:	Bowie Resources LLC	Quarter:	Second 2018
Mine:	Bowie No. 2 Mine - C-1996-083	Inspection Date:	13-Jun-18

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

Status During Inspection:

Approximate Water Level	Dry	Puddle	Dry	Dry	Dry	Dry
Sediment (% remaining)	95%	95%	90%	80%	95%	80%
Outflow (cfs)	0	0	0	0	0	0

Features	Problem	Problem	Problem	Problem	Problem	Problem
	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No

Erosional

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

Structural

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

Appurtenant Structures

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 was dry.
 Pond C held very little water and was below the primary spillway.
 Pond D was dry.
 Pond J was dry.
 Pond K was dry.
 Pond F was dry.
 There were no mud pits open at the end of the quarter.

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

Name of Inspector: Tamme Bishop



Tamme Bishop
 Colorado P.E. 43402 Date

BOWIE RESOURCES, LLC

Bowie No. 2 Mine

Coal Mine Waste Bank Nos. 1, 2, & 3 Inspections –2nd Quarter 2018

On June 13, 2018, 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 was seen at the toe of gob pile #2, west of the haul road. 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 2018. The lower diversion ditch (J3) was cleaned out in May 2017. 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 forth 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 no 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. 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. During the inspection, gob was being hauled out of the west drying area, and stacked in the drying area on top of gob pile #3. Gob was then replaced into the west drying area and compacted.

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.

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.



Kae Stover Bishop
Colorado Professional Engineer
Registration No. 43402

7-17-18
Date



Huddleston-Berry
Engineering & Testing, LLC

640 White Avenue
Grand Junction, Colorado 81501
Phone: 970-255-8005
Fax: 970-255-6818
Info@huddlestonberry.com

July 16, 2018
Project#01349-0001

Bowie Resources, LLC
43659 Bowie Road
Paonia, Colorado 81428

Attention: Mr. Bill Bear

Subject: Summary of Instrumentation Monitoring
2nd Quarter 2018
Bowie Coal Waste Disposal Area No. 2
Paonia, Colorado

Reference: *Summary of Instrumentation Monitoring, 1st Quarter 2017, Bowie Coal Waste Disposal Area No. 2, Paonia, Colorado* by Huddleston-Berry Engineering & Testing, LLC for Bowie Resources, LLC, April 16, 2018.

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 2nd Quarter 2018 monitoring was completed by DOWL on June 20th and July 12th, 2018. 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 indicate no major movements since the last quarterly reading. Slight deflection was indicated in the data for BG05-5 along the B-axis; however, the noted deflection is minimal. In addition, the overall profile of the data is the same as prior readings. This suggests an error in the deeper data which created an offset in the shallow data. However, additional evaluation will be conducted upon completion of the 3rd Quarter readings. In general, the 2nd Quarter 2018 monitoring data does not provide any indication of instability in CWDA No. 2.

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 on June 20th, 2018. 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)	03/22/18 Pore Pressure (psi)	06/20/18 Pore Pressure (psi)	Difference Since Installation (psi)	Difference Since Last Reading (psi)
VWP-05	6.8	1.5	1.5	-5.3	0.0
VWP-06	11.3	12.9	12.7	+1.4	-0.2
VWP-08	8.2	9.3	9.2	+1.0	-0.1
VWP-09	2.8	2.9	2.9	+0.1	0.0
VWP-10	-1.9	-1.7	-1.7	+0.2	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 6097 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

ATTACHMENTS

July 13, 2018

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

SUBJECT: Summary Report, 2nd Quarter 2018, Inclinator and Active Vibrating Wire Piezometer Data April – June 2018, 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 2018. VWP and inclinometer data was recorded on 6/20/18. Due to an electronic error during data collection of inclinometer BG05-5, a second set of readings was taken on this device on 7/12/18. 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)	03/22/18 (Q1) Pore Pressure (psi)	06/20/18 (Q2) Pore Pressure (psi)	Difference Since Installation (psi)	Difference Since Last Quarter (psi)
VWP-05	6.8	1.5	1.5	-5.3	0.0
VWP-06	11.3	12.9	12.7	1.4	-0.2
VWP-08	8.2	9.3	9.2	1.0	-0.1
VWP-09	2.8	2.9	2.9	0.1	0.0
VWP-10	-1.9	-1.7	-1.7	0.2	0.0

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 prior 2017-2018 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.

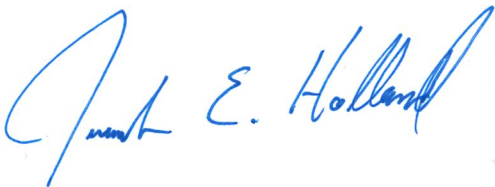
As described in previous reports, we believe historic displacements indicated on the plots for the approximate upper ten feet of the inclinometers are likely due to placement of cover soil on the face of the waste bank during normal operations for maintenance and revegetation.

Inclinometer BG05-5 Axis B shows a small offset in the orthogonal direction. This inclinometer reading was re-measured in July due to a large systematic offset. Because this is an orthogonal reading, not downslope, the offset is not likely to be slope movement and may be a systematic error. We will re-evaluate this small offset for the 3rd and 4th quarter readings.

Recent readings are generally consistent with previous readings, except for BG05-7A which has had anomalous readings in previous quarters near the surface and BG05-5B which is likely a small systematic instrument error to be confirmed with future readings.

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.

Respectfully Submitted,
DOWL

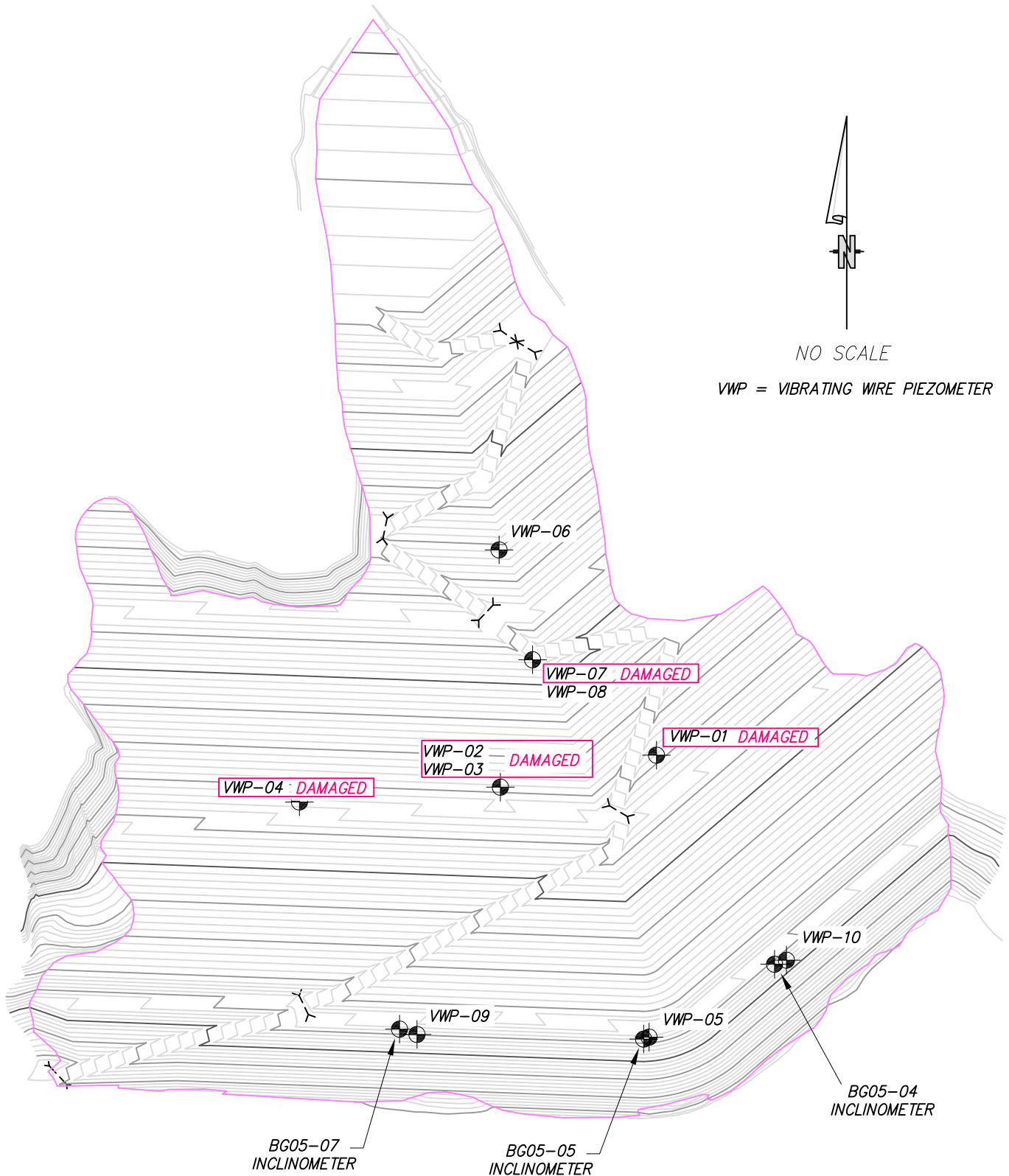


Jeremiah E. Holland, P.E.
Geotechnical Engineer

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



Map

1

OF 1

DATE

2017

JOB NO.

7131.74699.01

Huddleston-Berry

BOWIE #2 GOB PILE

DELTA COUNTY, COLORADO



WWW.DOWL.COM

222 South Park Avenue
Montrose, Colorado 81401
970-249-6828

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

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

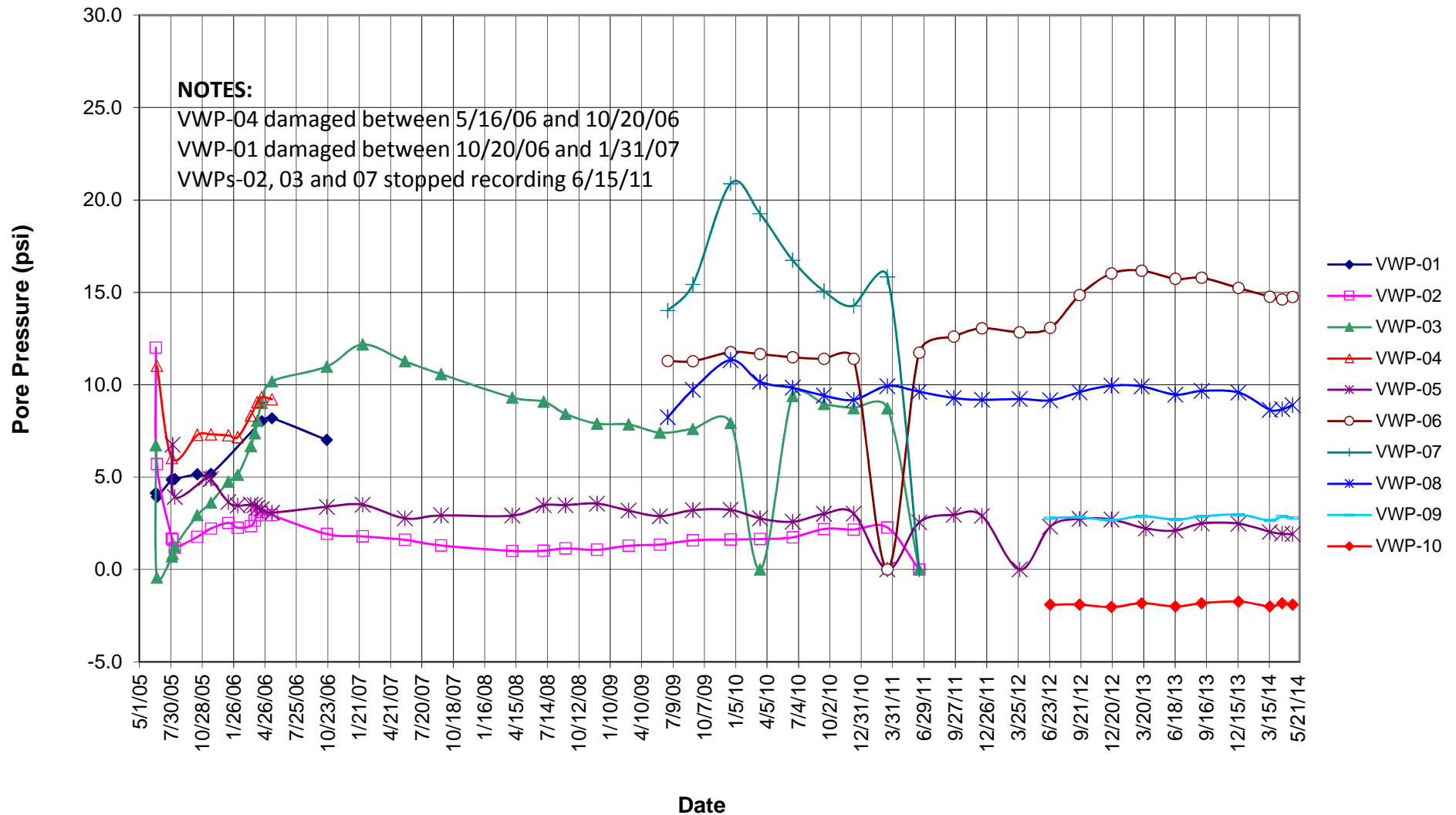


Figure 2 - Bowie Mine #2 - CWDA #2
Active Vibrating Wire Piezometer Data

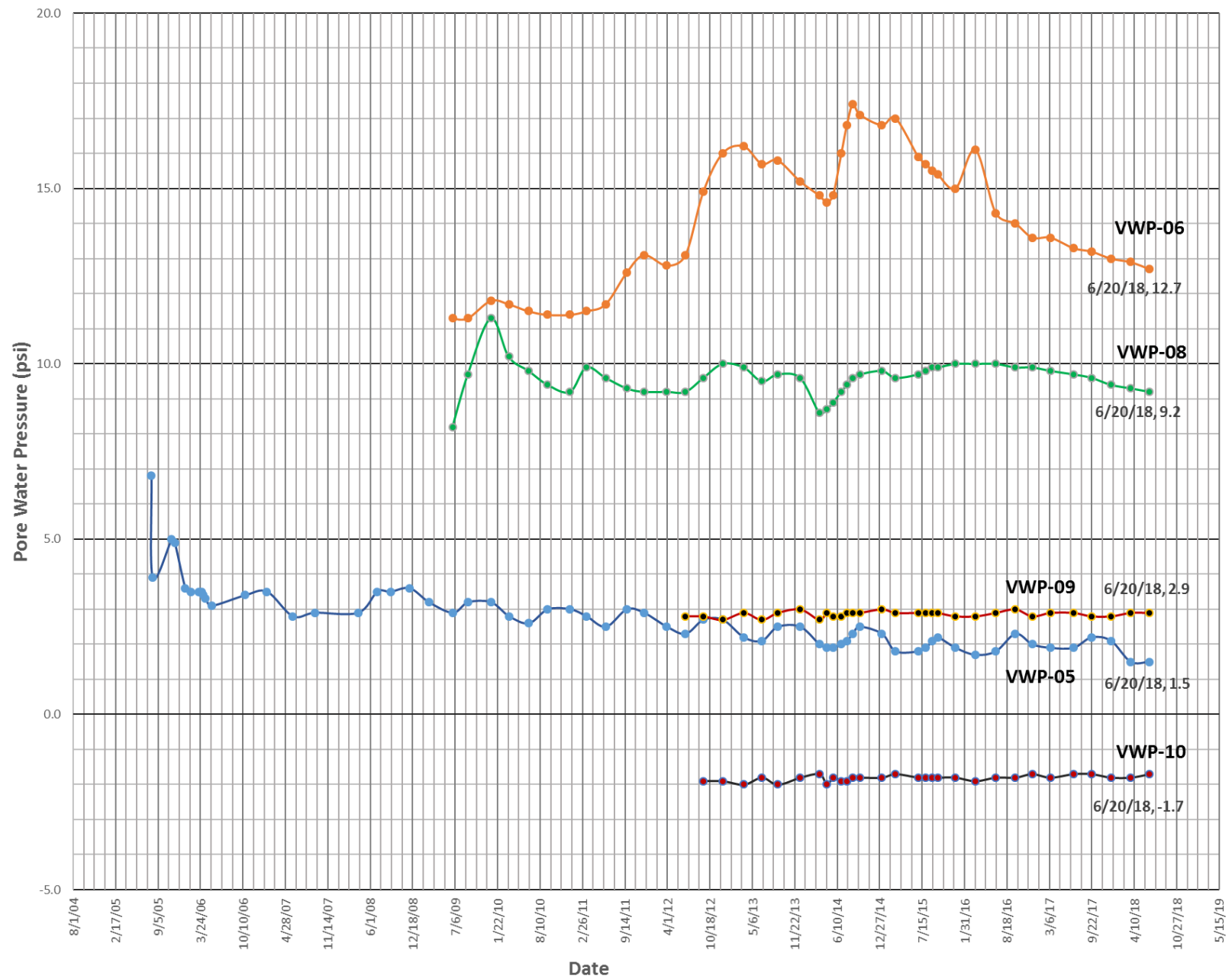
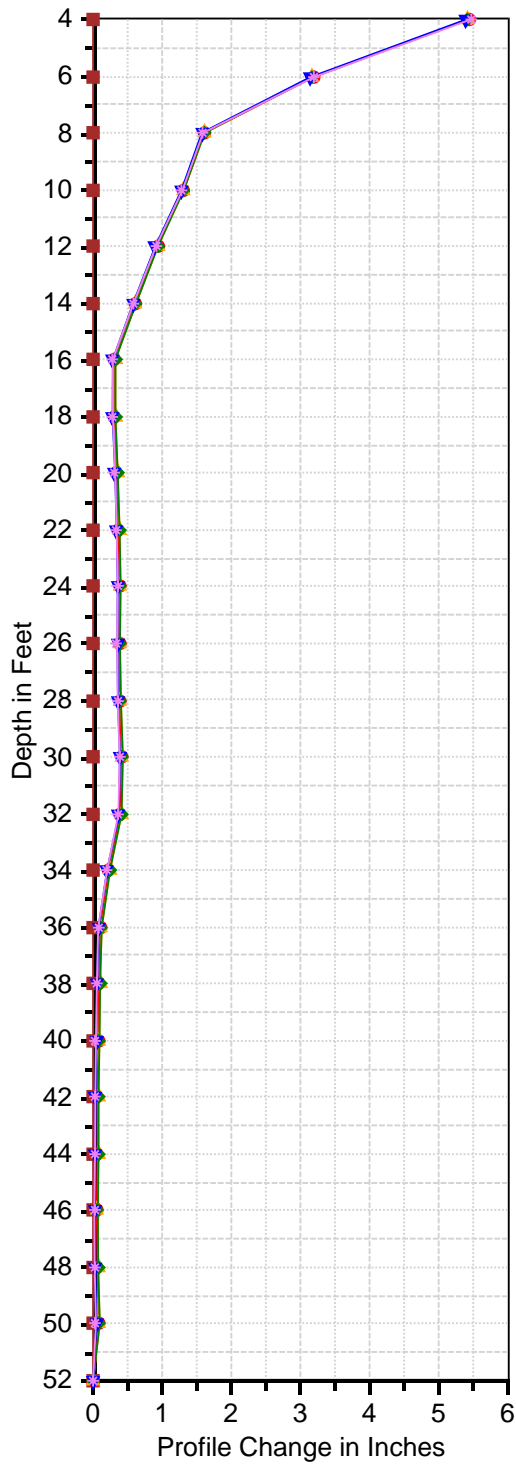


Figure 3 - Inclinometer Displacement Curves
 Bowie Mine #2, CWDA #2
 2018 Qtr 2

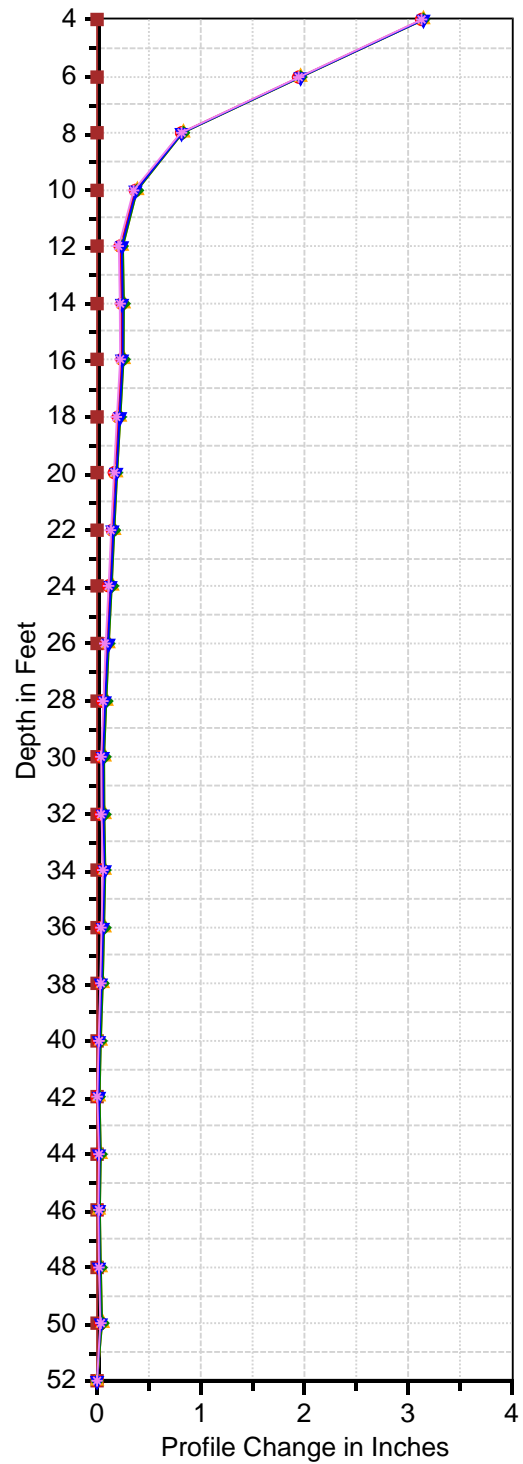
BOWIE BG05_4 A

8/10/2005 9/21/2017 12/20/2017
 1/20/2018 3/22/2018 6/20/2018



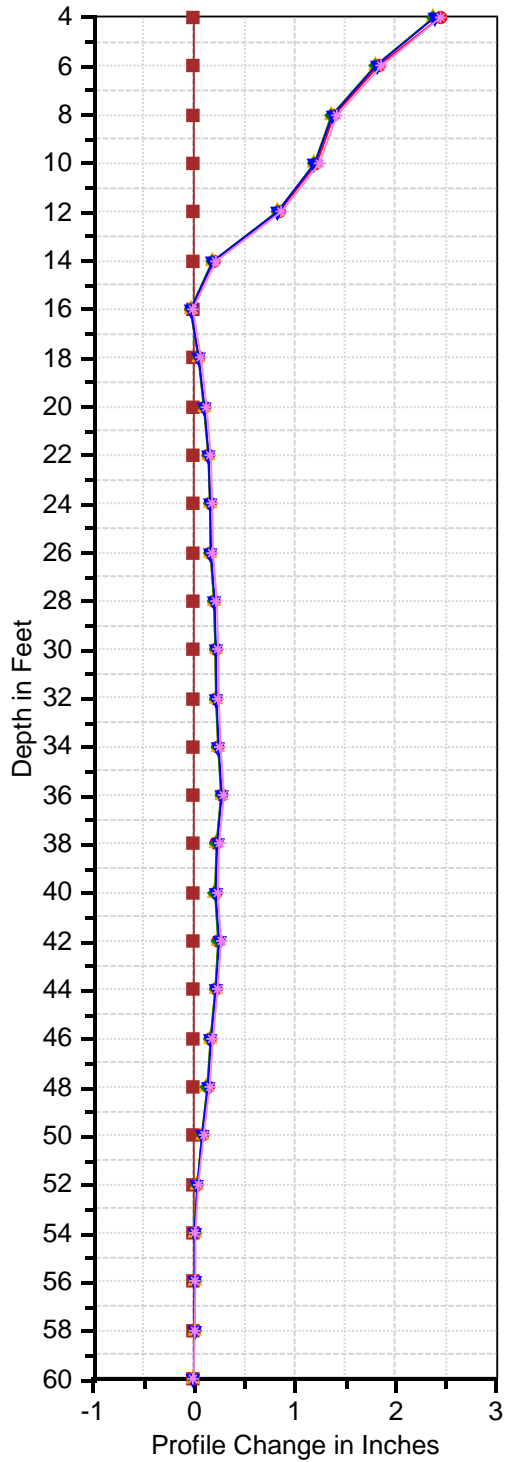
BOWIE BG05_4 B

8/10/2005 9/21/2017 12/20/2017
 1/20/2018 3/22/2018 6/20/2018



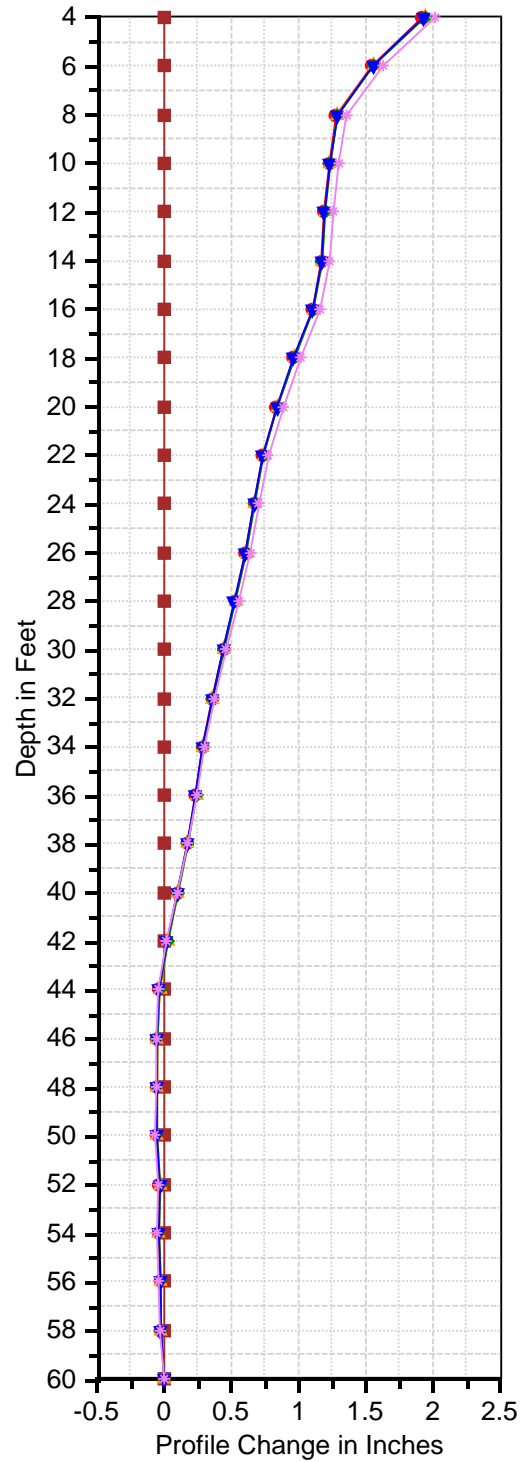
BOWIE BG05_5 A

■ 8/10/2005 ● 9/21/2017 ▲ 12/20/2017
◆ 1/20/2018 ▼ 3/22/2018 ✦ 7/12/2018



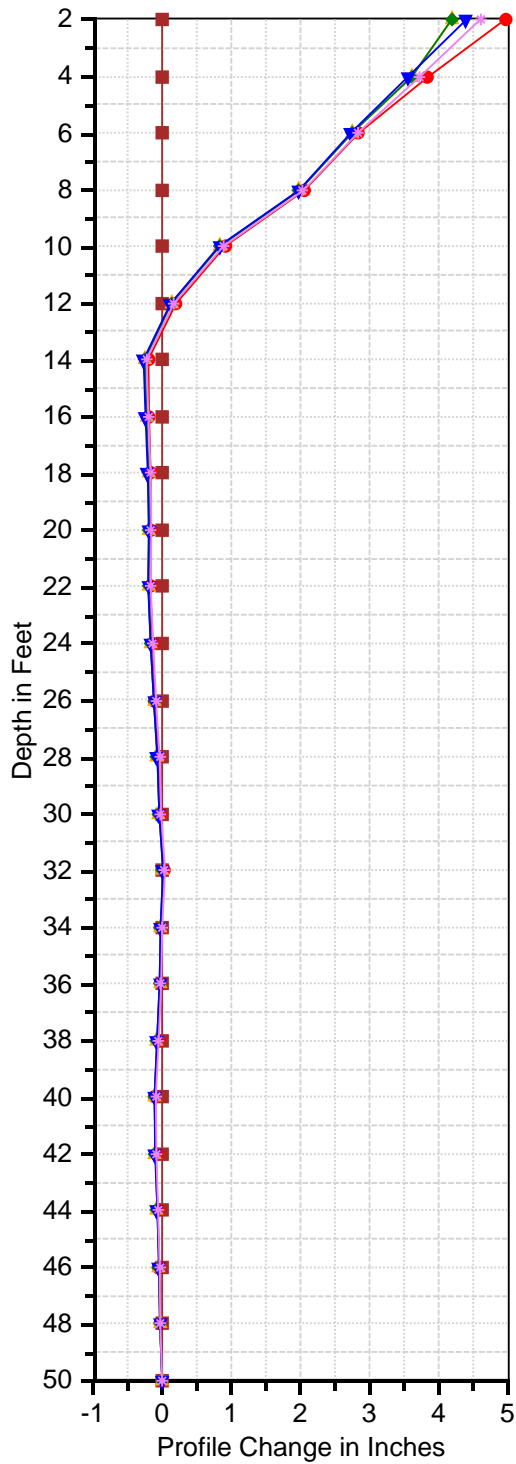
BOWIE BG05_5 B

■ 8/10/2005 ● 9/21/2017 ▲ 12/20/2017
◆ 1/20/2018 ▼ 3/22/2018 ✦ 7/12/2018



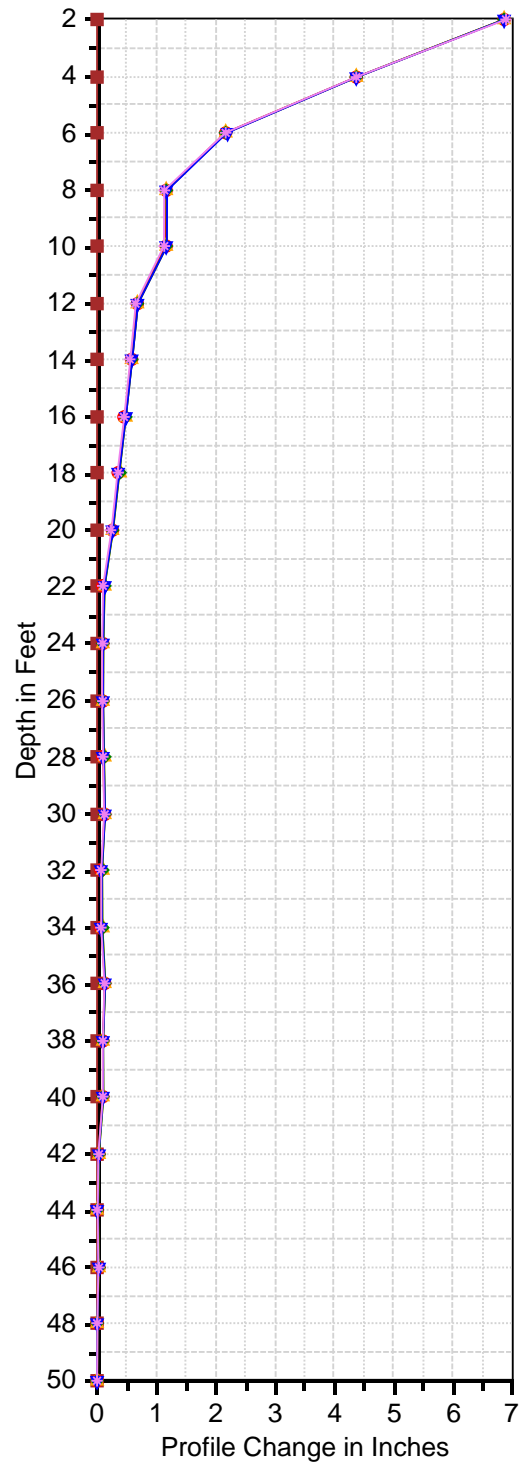
BOWIE BG05_7 A

8/10/2005 9/21/2017 12/20/2017
1/20/2018 3/22/2018 6/20/2018



BOWIE BG05_7 B

8/10/2005 9/21/2017 12/20/2017
1/20/2018 3/22/2018 6/20/2018





Huddleston-Berry
Engineering & Testing, LLC

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Info@huddlestonberry.com

July 12, 2018
Project#01349-0001

Bowie Resources, LLC
43659 Bowie Road
Paonia, Colorado 81428

Attention: Mr. Bill Bear

Subject: Summary of Instrumentation Monitoring
2nd Quarter 2018
Bowie Coal Waste Disposal Area No. 3
Paonia, Colorado

Reference: *Summary of Instrumentation Monitoring, 1st Quarter 2018, Bowie Coal Waste Disposal Area No. 3, Paonia, Colorado* by Huddleston-Berry Engineering & Testing, LLC for Bowie Resources, LLC, April 16, 2018.

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 20th, 2018. 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)	03/22/17 Pore Pressure (psi)	03/22/18 Pore Pressure (psi)	Difference Since Installation (psi)	Difference Since Last Reading (psi)
VWP-A Deep	10.4	4.1	4.7	-5.7	+0.6
VWP-A Shallow	4.7	3.7	3.6	-1.1	-0.1
VWP-B Deep	0.2	0.0	-0.1	-0.3	-0.1
VWP-B Shallow	13.9	11.5	11.1	-2.8	-0.4
VWP-D	7.1	5.9	5.7	-1.4	-0.2

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 have fluctuated within a narrow range. In general, HBET does not believe that the pore pressure changes in VWP-A Deep are cause for concern regarding stability of the gob pile.

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. 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 3rd 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. 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:

Huddleston-Berry Engineering and Testing, LLC



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

ATTACHMENTS