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Analysis of Rig Parameter Data Using Drilling Process Modeling Constraints

Volume 3: Utah FORGE Well 56-32

David W. Raymond, Melanie B. Schneider, Adam J. Foris and Jaiden E. Norton

Prepared by
Sandia National Laboratories
Albuquerque, New Mexico
87185 and Livermore,
California 94550

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ABSTRACT

Drill rig parameter measurements are routinely used during deep well construction to monitor and guide drilling conditions for improved performance and reduced costs. While insightful into the drilling process, these measurements are of reduced value without a standard to aid in data evaluation and decision making. In the main body of this work (Volume 1), a method is demonstrated whereby rock reduction model constraints are used to interpret drilling response parameters; the method could be applied in real-time to improve decision-making in the field and to further discern technology performance during post-drilling evaluations. Drilling parameters are evaluated using laboratory-validated rock reduction models for predicting the phenomenological response of drag bits (Detournay and Defourny, 1992) in computational algorithms. The method presented has applicability to development of advanced analytics on future geothermal wells using real-time electronic data recording for improved performance and reduced drilling costs. A drilling cost model is also used to show the tradeoff between rate of penetration and bit life and the influence on interval drilling costs.

Details of the bit specifications and performance are cataloged in an independent volume, documented under separate cover, for each of the four wells, and include Volume 2: Utah FORGE 16A(78)-32; Volume 3: Utah FORGE 56-32; Volume 4: Utah FORGE 78B-32 and Volume 5: Utah FORGE 16B(78)-32.

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CONTENTS

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

The United States Department of Energy has sponsored development of geothermal well construction at the Utah Frontier Observatory for Research in Geothermal Energy (FORGE). Drill rig parameter data were acquired by drilling contractor Frontier Drilling and evaluated for four wells: 1) Utah FORGE 16A(78)-32, a directional injection well with vertical depth to a kick-off point at 5892 ft and a 65 degree tangent to a measured depth of 10987 ft and, 2) Utah FORGE 56-32, a vertical monitoring well to a depth of 9145 ft, 3) Utah FORGE 78B-32, a vertical well drilled to a depth of 9500 ft, and 4) Utah FORGE 16B(78)-32, a directional production well drilled vertically to a kick-off point at 5269 ft, and a 65 degree tangent to a measured depth of 10947 ft. Sandia National Labs has accessed, cataloged, evaluated and recorded drill bit performance information used on the four Utah FORGE wells herein.

The subject drilling program has resulted in a large database of bit performance and durability records for drilling hot, hard rock characteristic of geothermal reservoirs. The majority of the Utah FORGE wells were drilled almost exclusively with Polycrystalline Diamond Compact (PDC) drill bits. The characteristic features of PDC bits and cutters are accordingly reviewed. While synthetic diamond cutter materials and bit design methodologies have improved over time, the recent success of these types of bits in hard rock formations may also be attributed to monitoring of drilling system response parameters using electronic data recorders on the surface rig for preferential performance and bit health monitoring.

Drill rig parameter measurements are routinely used during deep well construction to monitor and guide drilling conditions for improved performance and reduced costs. While insightful into the drilling process, these measurements are of reduced value without a standard to aid in data evaluation and decision making. In the main body of this work (Volume 1), a method is demonstrated whereby rock reduction model constraints are used to interpret drilling response parameters; the method could be applied in real-time to improve decision-making in the field and to further discern technology performance during post-drilling evaluations. Drilling parameters are evaluated using laboratory-validated rock reduction models for predicting the phenomenological response of drag bits (Detournay and Defourny, 1992) in computational algorithms. The method presented has applicability to development of advanced analytics on future geothermal wells using real-time electronic data recording for improved performance and reduced drilling costs.

Bit program and performance summaries are tabulated and presented for each well. These summaries include bit manufacturer model references, drilling system penetration rates, and overall bit lives. Representative drilling parameter data are evaluated to illustrate parameter use to monitor bit response, wear, and cutting structure damage. These bits failed by both normal wear and tear and drilling dynamic dysfunctions resulting in chipped and worn cutters, cutter shear and ring outs. Nevertheless, exemplar bit penetration rates easily exceeded 100 ft/hr and produced several 100 feet of hole construction. The tradeoff between rate of penetration and bit life is addressed with a drilling cost model using representative drilling cost parameters.

Details of the bit specifications and performance are cataloged in an independent volume, documented under separate cover, for each of the four wells, and include Volume 2: Utah FORGE 16A(78)-32; Volume 3: Utah FORGE 56-32; Volume 4: Utah FORGE 78B-32 and Volume 5: Utah FORGE 16B(78)-32. Bottom hole assembly information and daily drilling reports are also included.

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ACRONYMS AND DEFINITIONS

Abbreviation	Definition
BHA	Bottom Hole Assembly
DOE	Department of Energy
EDR	Electronic Data Recording
FORGE	Frontier Observatory for Research in Geothermal Energy
GTO	Geothermal Technology Office
ROP	Rate of Penetration
WOB	Weight on Bit

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1. BACKGROUND AND INTRODUCTION

Geothermal drilling is difficult as the rock is hot, hard, and often fractured. Wellbore construction costs have historically dominated the cost of geothermal energy development and have been an impediment to widespread development of geothermal energy. Technology improvements are needed to enable improved access and reduced drilling costs.

One technology improvement that can be applied to geothermal wellbore construction is the use of polycrystalline diamond compact (PDC) drill bits. Research and development on PDC drill bits has been sponsored by the United States Department of Energy for years resulting in improved diamond formulations, bonding techniques, bit designs, and hardening features that comprise the state of the art in the drilling industry. The oil and gas industry has benefited widely from these developments as the bits are routinely used to drill the majority of oil and gas wells worldwide. While the geothermal industry has benefited from incidental use of PDC bits for geothermal drilling, recent use of PDC bits at the DOE-sponsored Utah FORGE site has resulted in significant data for evaluation to address the efficacy of PDC bits for geothermal drilling.

1.1. Utah FORGE

The DOE-sponsored program, Utah Frontier Observatory for Research in Geothermal Energy (FORGE) was implemented to foster the development and demonstration of technologies supporting commercial applications of geothermal energy. The site is located near Milford, Utah (Moore, 2019). US DOE sponsorship of the FORGE activities de-risks developing technology for accessing deep geothermal reserves on a broad scale. One of the primary obstacles to commercial geothermal development is high drilling costs. The FORGE campaign applies state-of-the-art drilling technology to demonstrate well construction and completion activities on a utility scale. Multiple wells are planned over the life of the FORGE program. Well 16A(78)-32 is a directional well. Well 56-32 is a vertical monitoring well. Well 78B-32 is a vertical monitoring well. Well 16B(78)-32 is a directional well. These four wells were drilled with the top-drive, triple shown in Figure 1-1.

Figure 1-1. Frontier Rig 16 used to drill wells 16A(78)-32, 56-32,78B-32 and 16B(78)-32.

1.2. Sandia Role

With a long legacy of programmatic research pertaining to the development of synthetic diamond drill bit technology, Sandia is participating with DOE/EERE/GTO and the Utah FORGE drilling program to provide evaluations of the rock reduction technologies used at Utah FORGE. Although not expressly involved in the day-to-day decisions associated with the drilling program, the Sandia team has accessed electronic data recording (EDR) services to review drilling system performance. This effort has primarily been focused on monitoring and evaluation of multiple parameters to identify areas where improved productivity and cost savings can be realized via improved drilling performance. Drilling response parameters have been compared to rock reduction model constraints that have been proven in the laboratory to identify possible performance enhancement areas.

The methods used have been exercised in a post-processing manner. To provide the greatest benefit to the drilling process, a method is needed to enable the intuitive interpretation of response parameters and is amenable to implementation in computational algorithms for real-time evaluation. A method is demonstrated whereby drilling response parameters may be interpreted for improved drilling performance. This analysis is not an exhaustive assessment but rather an overview of representative bit performance that demonstrates the application of the approach using rock reduction constraints. Drilling data from the Utah FORGE site have been used for the analyses.

2. FORGE WELL 56-32 DESCRIPTION

2.1. Well Program

Utah FORGE Well 56-32 was drilled vertically to a depth of 9105 ft. The well will be used for monitoring and research activities. The well profile is shown in Figure 2-1.

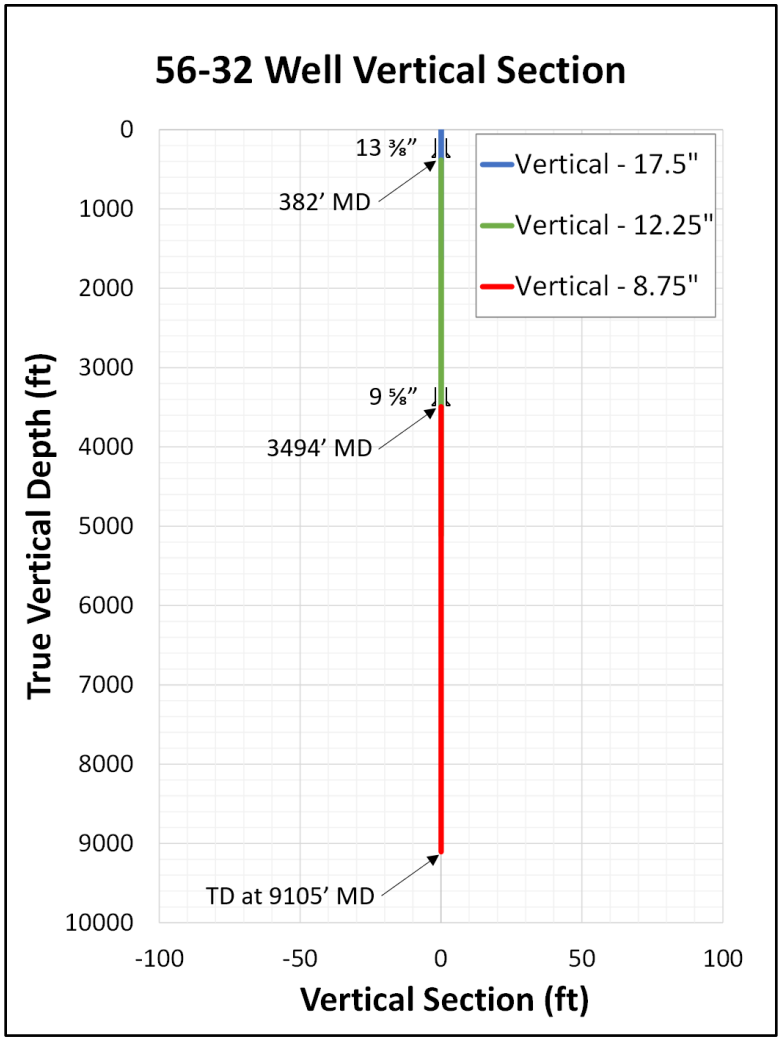


Figure 2-1. Utah FORGE Well 56-32 Profile.

2.2. Drilling Parameter Data Acquisition

Pason US DataHub service was used to access EDR.

2.3. Drilling Narrative

FORGE well 56-32 bit runs comprised the following:

- 17-1/2” Diameter Surface Hole
  - Bit Run #1 (Frontier Bit #1) drilled 17-1/2” hole from 128’ to 380.5’.
  - 13-3/8” diameter casing was set and cemented.

- 12-1/4" Diameter Vertical Hole
    - Bit Run #2 (Frontier Bit #2) drilled out the cement to 390'.
    - Bit Run #3 (Frontier Bit #3) drilled 12-1/4" hole from 390' to 3309'.
    - Bit Run #4 (Frontier Bit #4) drilled 12-1/4" hole from 3309' to 3500'.
    - 9-5/8" diameter casing was set and cemented.
    - Bit Run #5 (Frontier Bit #5 & #2) was used to drill out the cement.
- 8-3/4" Diameter Vertical Hole
    - Bit Run #6 (Frontier Bit #6) drilled 8-3/4" vertical hole from 3506' to 4595'.
    - Bit Run #7 (Frontier Bit #7) drilled 8-3/4" vertical hole from 4595' to 5143'.
    - Bit Run #8 (Frontier Bit #8) drilled 8-3/4" vertical hole from 5143' to 5610'.
    - Bit Run #9 (Frontier Bit #9) drilled 8-3/4" vertical hole from 5610' to 5999'.
    - Bit Run #10 (Frontier Bit #10) drilled 8-3/4" vertical hole from 5999' to 7208'.
    - Bit Run #11 (Frontier Bit #11) drilled 8-3/4" vertical hole from 7208' to 7620'.
    - Bit Run #12 (Frontier Bit #12) drilled 8-3/4" vertical hole from 7620' to 7628'.
    - Bit Run #13 (Frontier Bit #11) drilled 8-3/4" vertical hole from 7628' to 7663'.
    - Bit Run #14 (Frontier Bit #13) drilled 8-3/4" vertical hole from 7663' to 7667'.
    - Bit Run #15 (Frontier Bit #13) drilled 8-3/4" vertical hole from 7667' to 8900'.
    - Bit Run #16 (Frontier Bit #14) drilled 8-3/4" vertical hole from 8900' to 9145'.

2.4. Bit Program & Performance Summary

The bit program and resulting performance used on FORGE 56-32 are shown in Table 2-1 and Figure 2-2. Individual bit run summaries and processed data for FORGE well 16B(78)-32 is summarized in Section 3. A bit run summary is included for each bit along with BHA component information where pre-drill and post-drill images are included when available. The EDR data acquired for each bit was taken at a rate of one sample per 1 ft. This data is processed for each drill-ahead bit and includes 1) Reduction parameters (WOB, Torque on Bit, Bit Speed, and ROP vs. Depth, 2) Depth of cut per revolution vs. Depth, 3) Specific Energy and Drilling Strength vs. Depth, 4) Specific Energy vs. Drilling Strength (the linear regression does not account for the scatter due to sliding), 5) Rotary Speed Components (Top Drive, Motor and Bit) vs. depth, and 6) Rotary Torque components (Top Drive, Motor and Bit) vs. depth.

Table 2-1. FORGE Well 56-32 Bit Summary

Bit Run No.	Manufacturer	Type	Serial No.	BHA	Bit Dia. (in)	Depth Start (ft)	Depth End (ft)	Total Footage (ft)	Time on Bottom (hrs)	Net ROP (ft/hr)
1	ReedHycalog	TK59-B1	A252419	1	17.50	134.0	381.0	247.0	1.2	205.8
2	-	M-22	-	-	12.25	381.0	390.0	9.0	0.1	90.0
3	ReedHycalog	TKC66-R1	A266974	2	12.25	390.0	3309.0	2919.0	9.7	300.9
4	ReedHycalog	TK63-A1A	A268226	3	12.25	3309.0	3500.0	191.0	2.6	73.5
5	-	GX-177	-	4	8.75	3500.0	3506.0	6.0	0.8	7.5
6	ReedHycalog	TKC73-H1	A275660	4	8.75	3506.0	4595.0	1089.0	28.9	37.7
7	-	EP5475	5042714	5	8.75	4595.0	5143.0	548.0	26.2	20.9
8	ReedHycalog	TKC63-P1	A277166	6	8.75	5143.0	5610.0	467.0	15.5	30.1
9	ReedHycalog	TKC63-P1	A271436	7	8.75	5610.0	5999.0	389.0	14.8	26.3
10	ReedHycalog	FTKC73-A1	A275803	8	8.75	5999.0	7208.0	1209.0	52.1	23.2
11	ReedHycalog	FTKC73-A1	A276121	9	8.75	7208.0	7620.0	412.0	4.8	85.8
12	E6	Hammer	-	-	8.75	7620.0	7628.0	8.0	0.8	10.0
13	ReedHycalog	FTKC63-A1	A276121	-	8.75	7628.0	7663.0	35.0	1.1	31.8
14	E6	Hammer	-	-	8.75	7663.0	7667.0	4.0	0.8	5.0
15	ReedHycalog	TKC63-P1	A271437	10	8.75	7667.0	8900.0	1233.0	37.0	33.3
16	ReedHycalog	FTKC83-A3	A276071	11	8.75	8900.0	9145.0	245.0	3.2	76.6

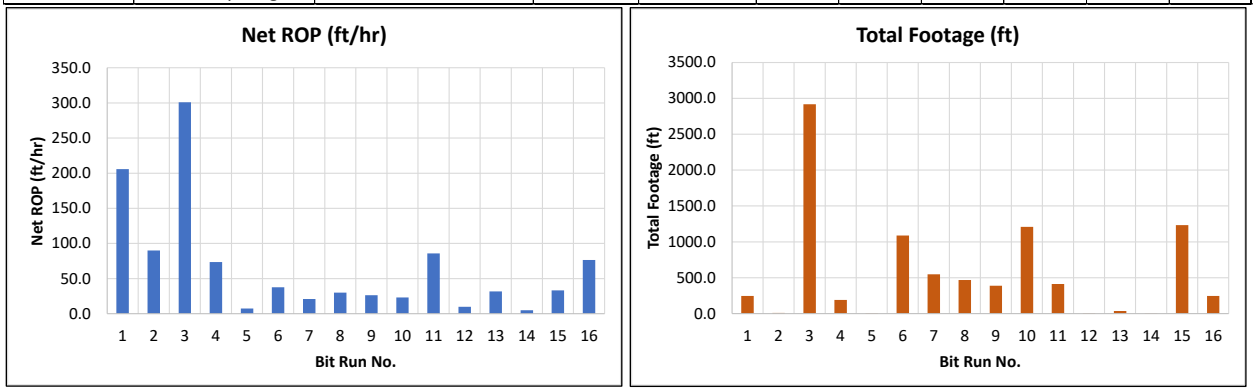


Figure 2-2. Utah FORGE Well 56-32 Bit Program and Performance Summary.

Individual bit run summaries and processed data for FORGE well 78B-32 is summarized in Section 3.

2.5. Depth vs Days Summary

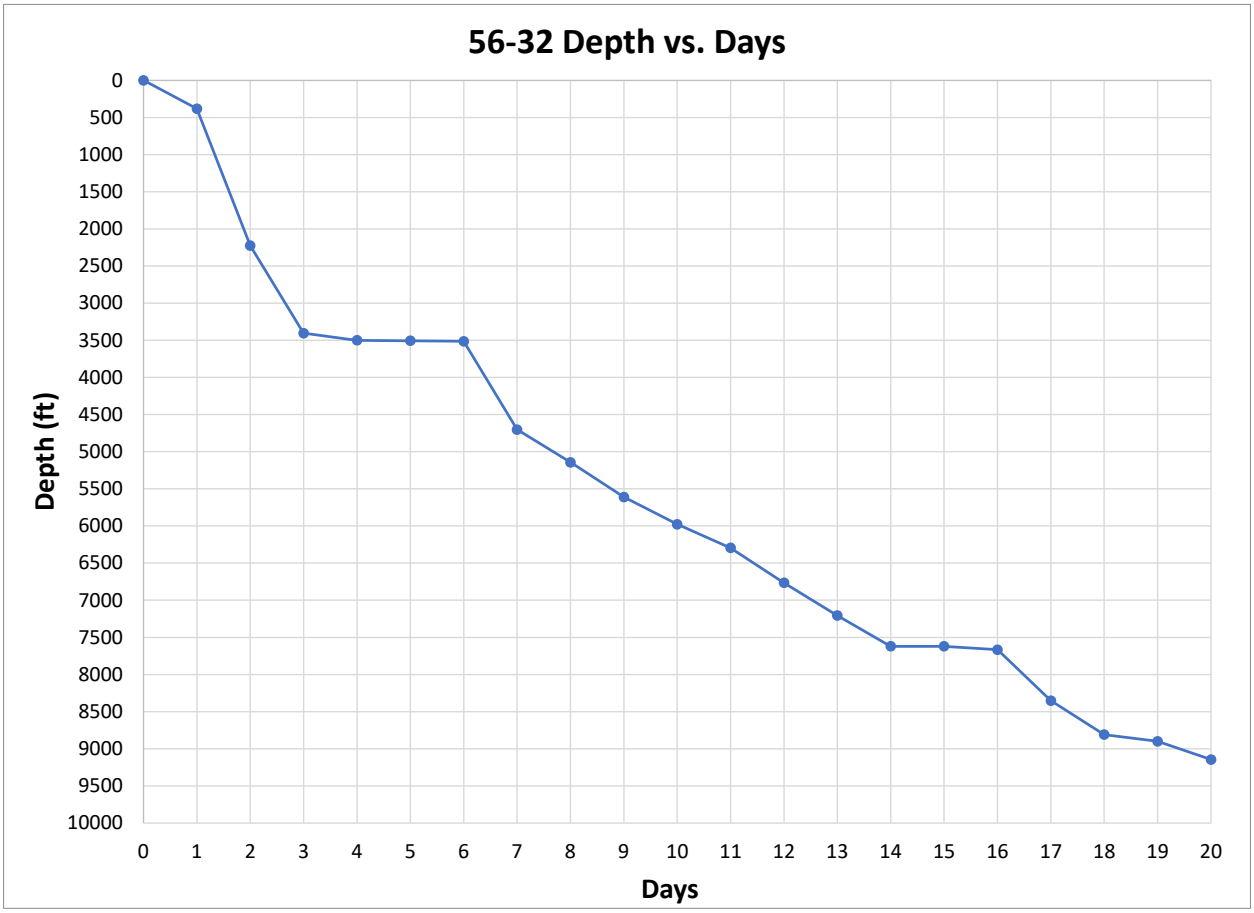


Figure 2-3. Depth vs Days Summary for Utah FORGE Well 56-32.

3. BIT RUN SUMMARIES AND PROCESSED DATA

3.1. Bit-01

Table 3-1: Bit 1 run summary.

Run No.	Run Date	Bit Diameter (in)	Manufacturer	Type	Serial No
1	2/8/2021	17.50	ReedHycalog	TK59-B1	A25419
BHA No.	**Depth Start (ft)**	**Depth End (ft)**	**Total Footage (ft)**	**Time on Bottom (hrs)**	**Net ROP (ft/hr)**
1	133	380	247	1.2	205.8

Table 3-2: BHA 1 component makeup.

BHA No.	Component	Stab. OD	OD	ID	Length	Cum. Length
1	JETS 5 X 18 PDC BIT TFA=1.243		7.5	3	1.2	1.3
2	9 5/8 MOTOR 6.7L 5.0Stg .13RPG		9.625		33.63	34.83
3	NMST STAB	17.25	8.0625	3	5.4	40.23
4	4 SHOCK TOOL		8.0625	2.875	12.68	52.91
5	NMUBHO		8.125	3.75	3.53	56.44
6	NMDC		7.875	3.25	28.96	85.4
7	XO				3.34	88.74

3.2. Bit-02

Table 3-3: Bit 2 run summary.

Run No.	Run Date	Bit Diameter (in)	Manufacturer	Type	Serial No
2	2/9/2021	12.25	Mill Tooth	M-22	-
BHA No.	**Depth Start (ft)**	**Depth End (ft)**	**Total Footage (ft)**	**Time on Bottom (hrs)**	**Net ROP (ft/hr)**
-	381	390	9	0.1	90.0

3.3. Bit-03

Table 3-4: Bit 3 run summary.

Run No.	Run Date	Bit Diameter (in)	Manufacturer	Type	Serial No
3	2/9/2021	12.25	ReedHycalog	TKC66-R1	A266974
BHA No.	**Depth Start (ft)**	**Depth End (ft)**	**Total Footage (ft)**	**Time on Bottom (hrs)**	**Net ROP (ft/hr)**
2	390	3308	2918	9.7	300.9

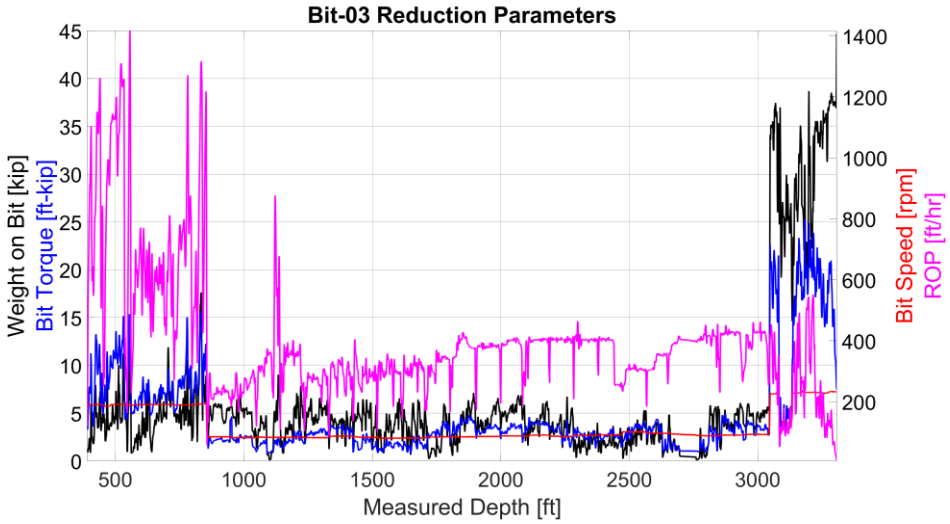
Table 3-5: BHA 2 component makeup.

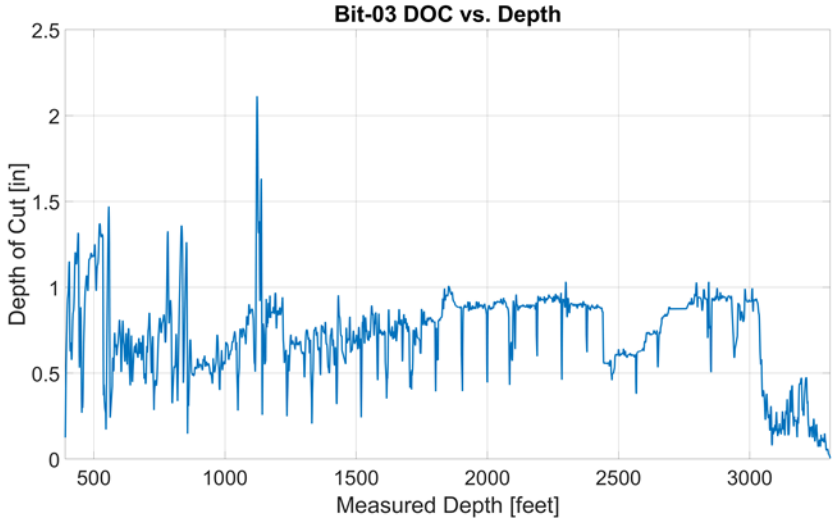
BHA No.	Component	Stab. OD	OD	ID	Length	Cum. Length
1	JETs 6 x 14 PDC BIT TFA= 0.9019		12.35	3	1.2	1.2
2	8" MOTOR 7:8L 5.9Stg .16RPG		8		33.12	34.32
3	NMUBHO		8.125	3.75	3.53	37.85
4	NM STAB		8	3	4.85	42.7
5	NMDC		7.875	3.25	28.96	71.66
6	SHOCK TOOL		8.0625	2.875	12.68	84.34
7	DRILL COLLAR		8	3	273.61	357.95
8	XO				3.19	361.14
9	24 x HWDP		5	3.25	730.42	1091.56

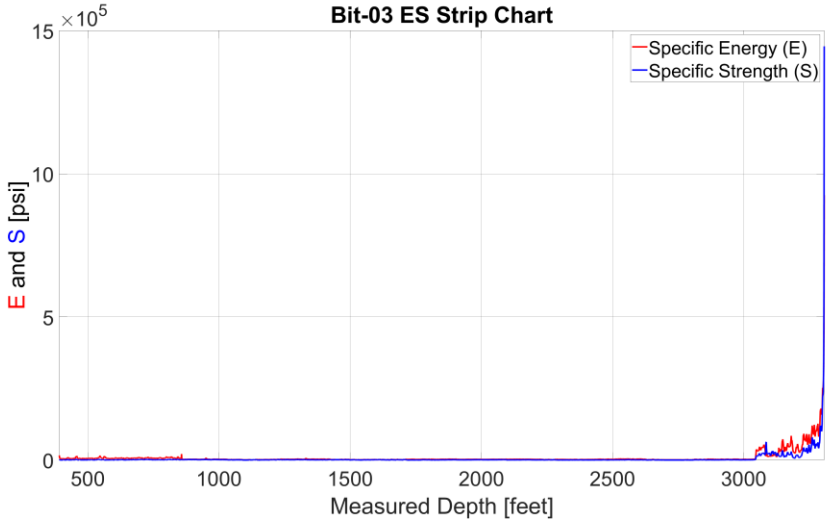
Images:

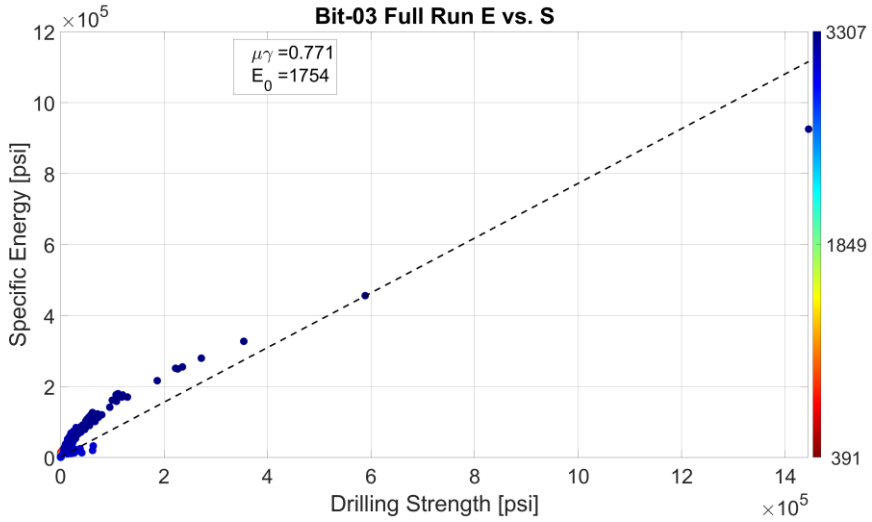
Figure 3-1. Post-drill photo of bit #3.

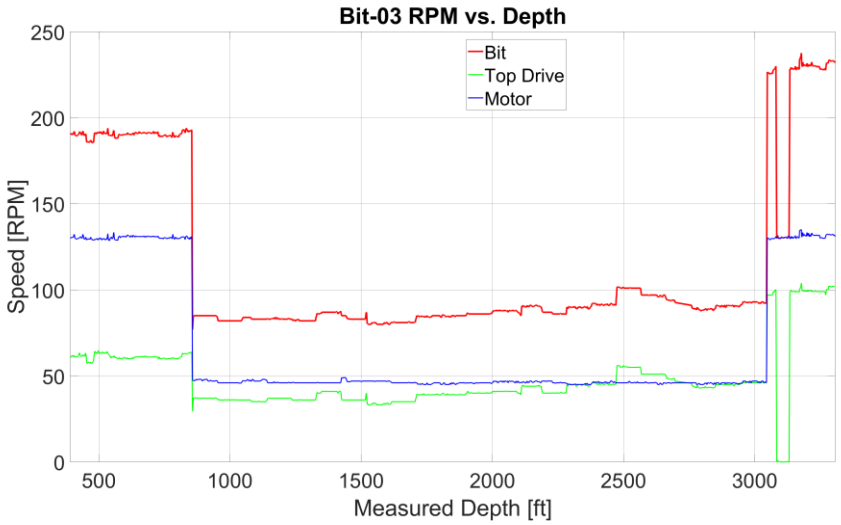
Bit Run Figures:

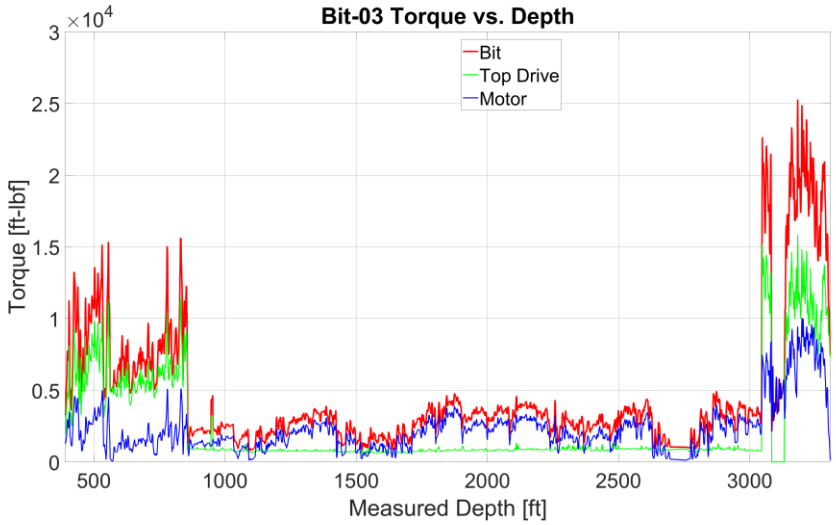







Bit-03 Full Run E vs. S
$\mu\gamma$ =0.771
E_0 =1754
Specific Energy [psi]
Drilling Strength [psi]
×10^5
3307
1849
391


Bit-03 RPM vs. Depth
Bit
Top Drive
Motor
Speed [RPM]
Measured Depth [ft]


Bit-03 Torque vs. Depth
×10^4
Bit
Top Drive
Motor
Torque [ft-lbf]
Measured Depth [ft]

3.4. Bit-04

Table 3-6: Bit 4 run summary.

Run No.	Run Date	Bit Diameter (in)	Manufacturer	Type	Serial No
4	2/10/2021	12.25	ReedHycalog	TKC63-A1A	A26B2226
BHA No.	**Depth Start (ft)**	**Depth End (ft)**	**Total Footage (ft)**	**Time on Bottom (hrs)**	**Net ROP (ft/hr)**
3	3308	3500	192	2.6	73.5

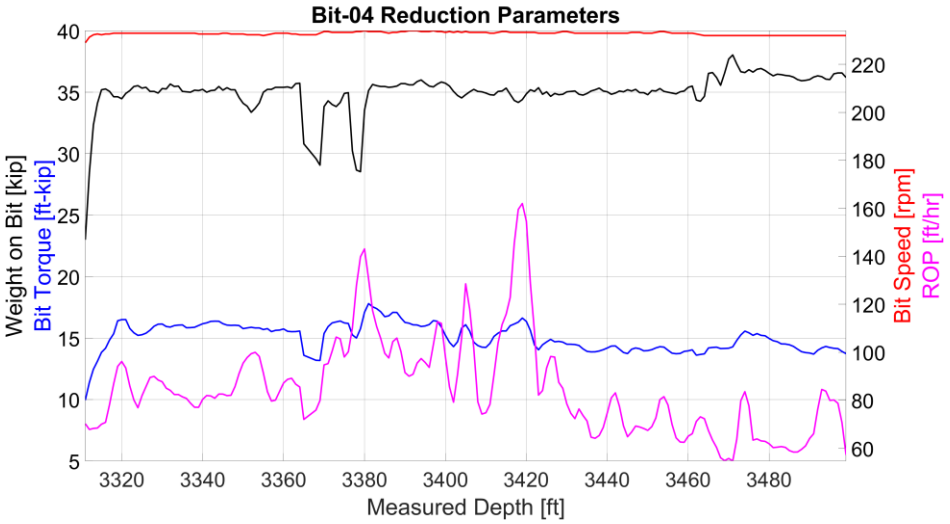
Table 3-7: BHA 3 component makeup.

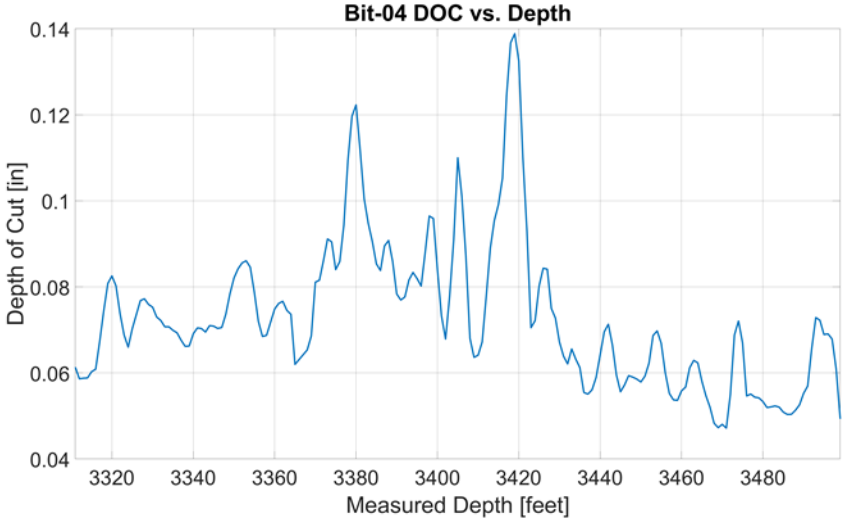
BHA No.	Component	Stab. OD	OD	ID	Length	Cum. Length
1	JETs 6 x 14 PDC BIT TFA= 0.9019		12.35	3	1.2	1.2
2	8" MOTOR 7:8L 5.9Stg .16RPG		8		33.12	34.32
3	NMUBHO		8.125	3.75	3.53	37.85
4	NM STAB		8	3	4.85	42.7
5	NMDC		7.875	3.25	28.96	71.66
6	SHOCK TOOL		8.0625	2.875	12.68	84.34
7	DRILL COLLAR		8	3	273.61	357.95
8	XO				3.19	361.14
9	24 x HWDP		5	3.25	730.42	1091.56

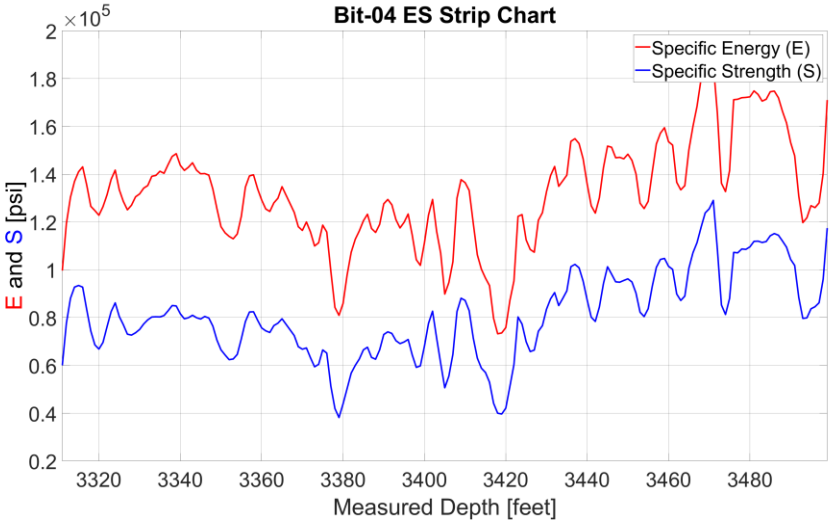
Images:

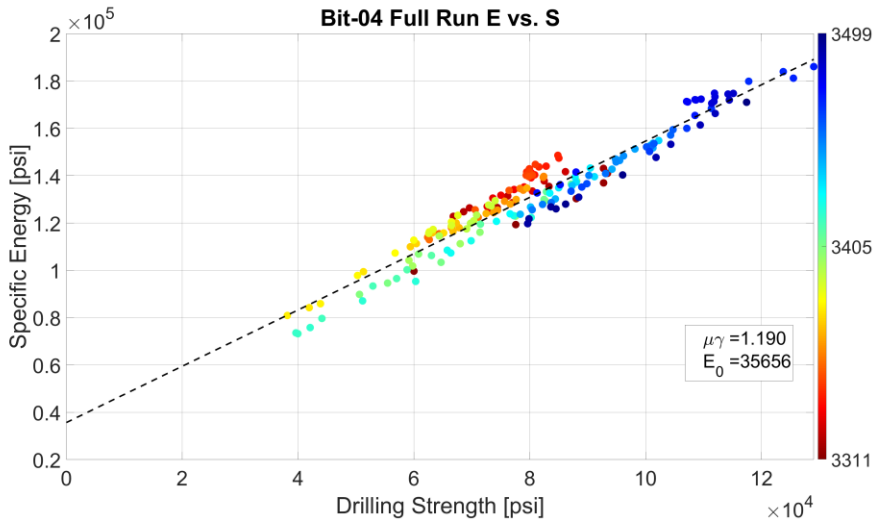
Figure 3-2. Post-drill photo of bit #4.

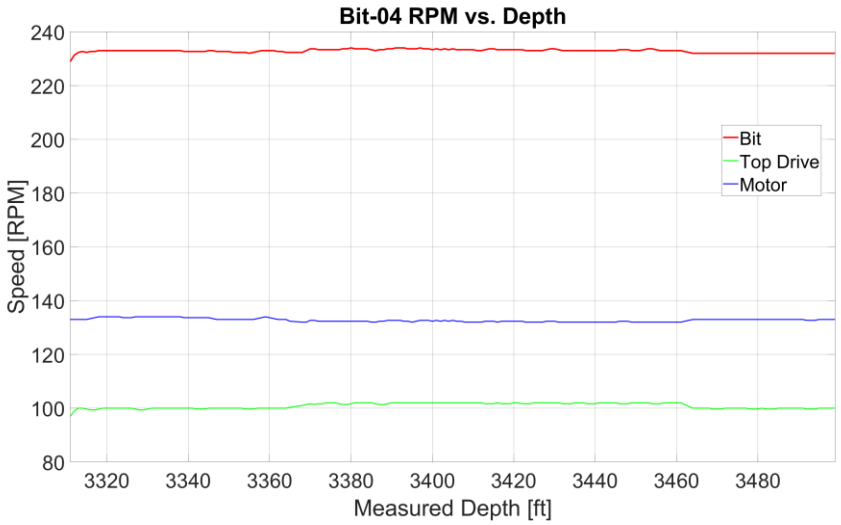
Bit Run Figures:

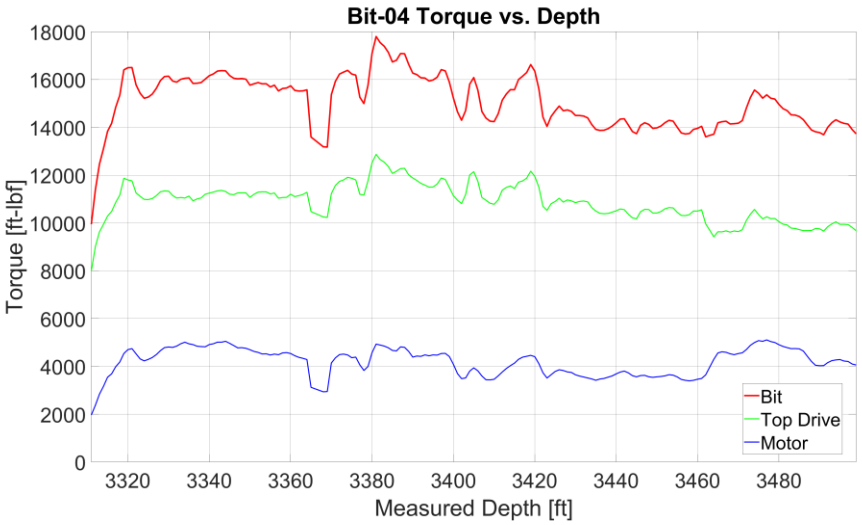







Bit-04 Full Run E vs. S
×10^5
Specific Energy [psi]
Drilling Strength [psi]
×10^4
μγ =1.190
E0 =35656
3499
3405
3311


Bit-04 RPM vs. Depth
Speed [RPM]
Measured Depth [ft]
Bit
Top Drive
Motor


Bit-04 Torque vs. Depth
Torque [ft-lbf]
Measured Depth [ft]
Bit
Top Drive
Motor

3.5. Bit-05

Table 3-8: Bit 5 run summary.

Run No.	Run Date	Bit Diameter (in)	Manufacturer	Type	Serial No
5	2/11/2021	8.75	Hughes	TOOTH GX-117	
BHA No.	**Depth Start (ft)**	**Depth End (ft)**	**Total Footage (ft)**	**Time on Bottom (hrs)**	**Net ROP (ft/hr)**
4	3500	3506	6	0.8	7.5

Table 3-9: BHA 4 component makeup.

BHA No.	Component	Stab. OD	OD	ID	Length	Cum. Length
1	Jets4x13 3x12 PDC TFA=.849		8.75	1.5	0.85	0.85
2	7" Motor 6:7 6.5 1.50Fixed	8.5	7		33.02	33.87
3	NMUBHO		6.8125	3.25	3.04	36.91
4	NM STAB	8.5	6.5	3	4.12	41.03
5	NMDC		6.5	3.25	27.81	68.84
6	SHOCK TOOL		6.75		10.73	79.57
7	12XDC'S		6.5	2.875	368.13	447.7
8	24XHWDP		5	3.25	730.42	1178.12

3.6. Bit-06

Table 3-10: Bit 6 run summary.

Run No.	Run Date	Bit Diameter (in)	Manufacturer	Type	Serial No
6	2/13/2021	8.75	ReedHycalog	TKC73-H1	A275660
BHA No.	**Depth Start (ft)**	**Depth End (ft)**	**Total Footage (ft)**	**Time on Bottom (hrs)**	**Net ROP (ft/hr)**
4	3506	4595	1089	28.9	37.7

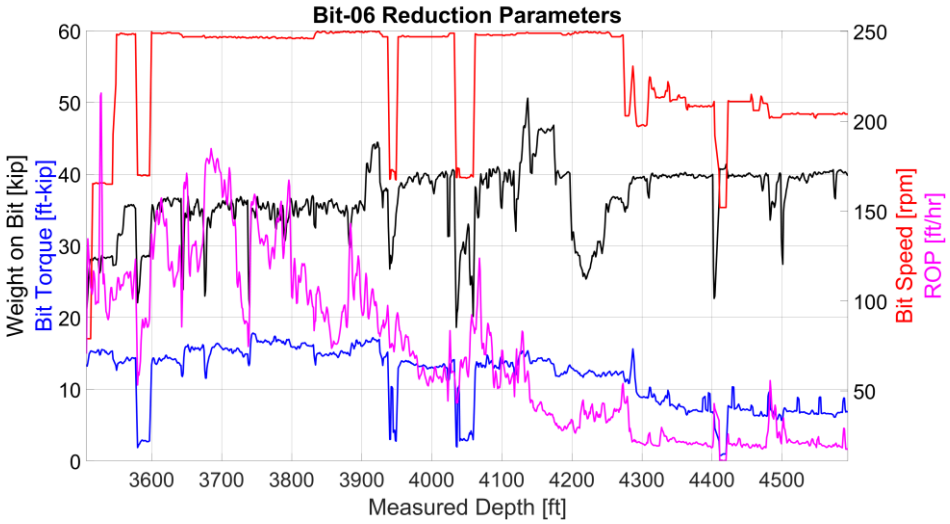
Table 3-11: BHA 4 component makeup.

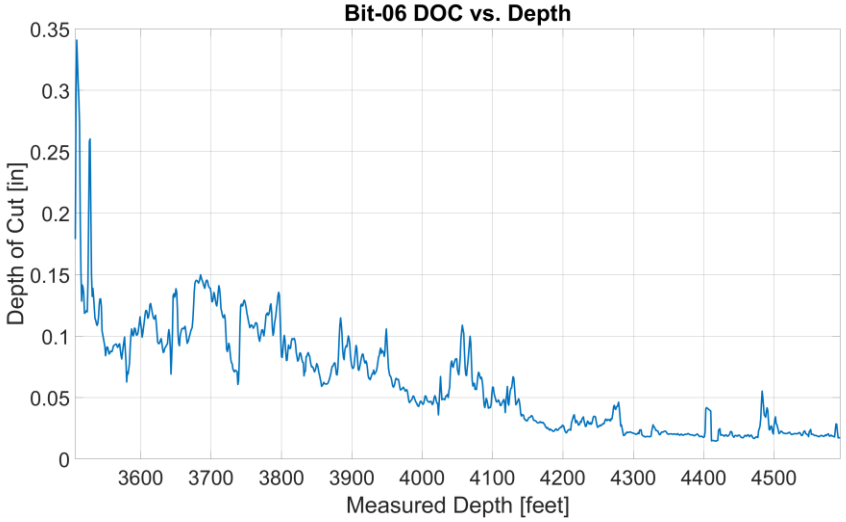
BHA No.	Component	Stab. OD	OD	ID	Length	Cum. Length
1	Jets4x13 3x12 PDC TFA=.849		8.75	1.5	0.85	0.85
2	7" Motor 6:7 6.5 1.50Fixed	8.5	7		33.02	33.87
3	NMUBHO		6.8125	3.25	3.04	36.91
4	NM STAB	8.5	6.5	3	4.12	41.03
5	NMDC		6.5	3.25	27.81	68.84
6	SHOCK TOOL		6.75		10.73	79.57
7	12XDC'S		6.5	2.875	368.13	447.7
8	24XHWDP		5	3.25	730.42	1178.12

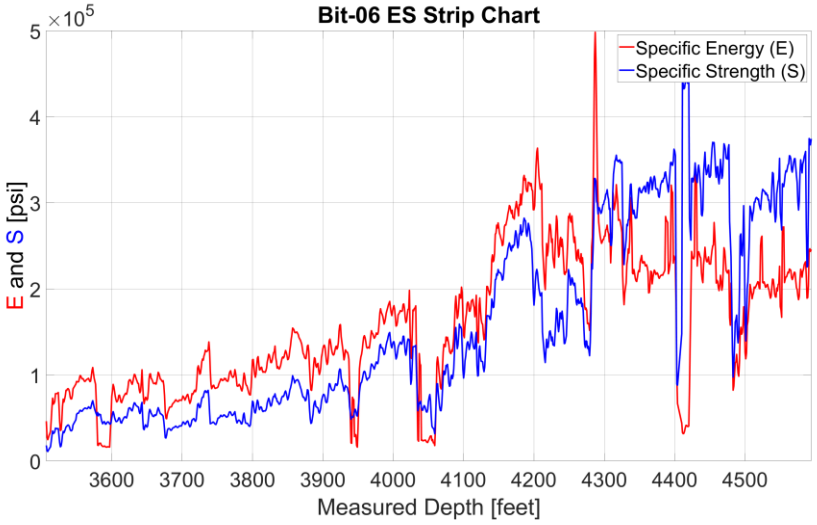
Images:

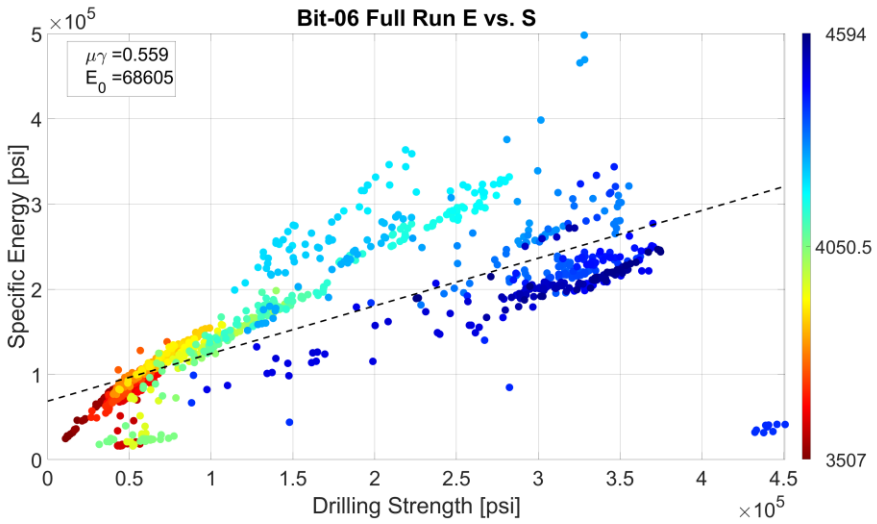
Figure 3-3. Post-drill photo of bit #6.

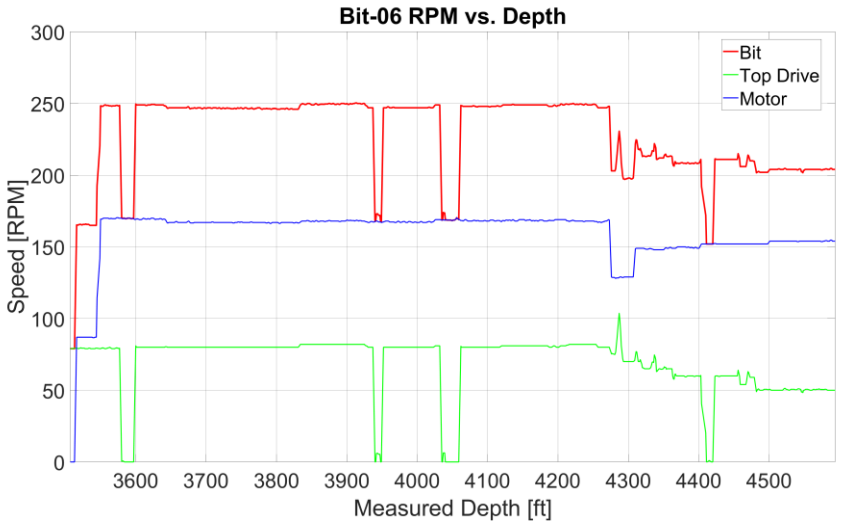
Bit Run Figures:

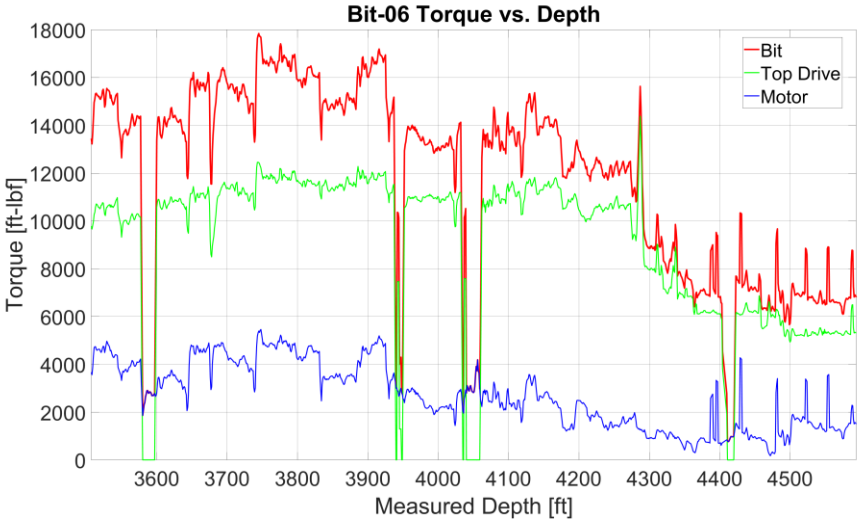







Bit-06 Full Run E vs. S
$\mu\gamma$ =0.559
E_0 =68605
Specific Energy [psi]
Drilling Strength [psi]
×10^5
4594
4050.5
3507


Bit-06 RPM vs. Depth
Bit
Top Drive
Motor
Speed [RPM]
Measured Depth [ft]


Bit-06 Torque vs. Depth
Bit
Top Drive
Motor
Torque [ft-lbf]
Measured Depth [ft]

3.7. Bit-07

Table 3-12: Bit 7 run summary.

Run No.	Run Date	Bit Diameter (in)	Manufacturer	Type	Serial No
7	2/14/2021	8.75	Hughes	EP5475	5042714
BHA No.	**Depth Start (ft)**	**Depth End (ft)**	**Total Footage (ft)**	**Time on Bottom (hrs)**	**Net ROP (ft/hr)**
5	4595	5143	548	26.2	20.9

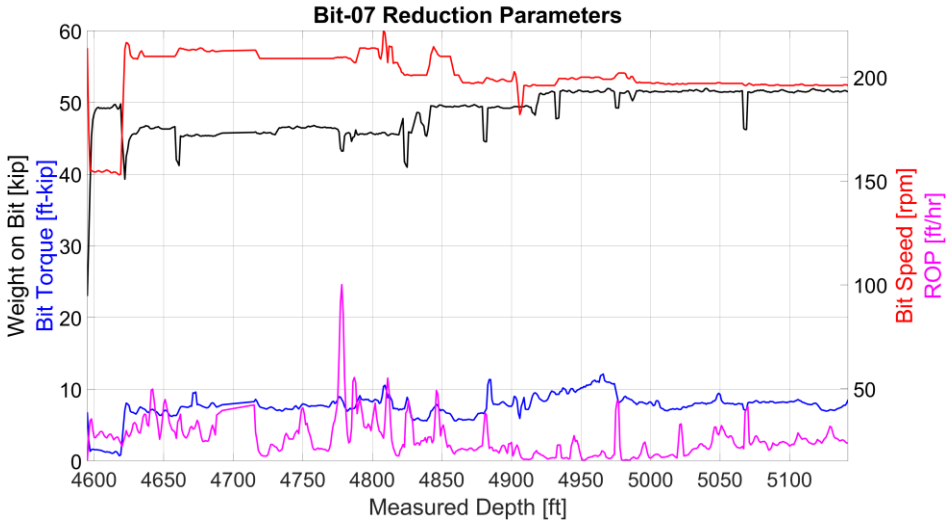
Table 3-13: BHA 5 component makeup.

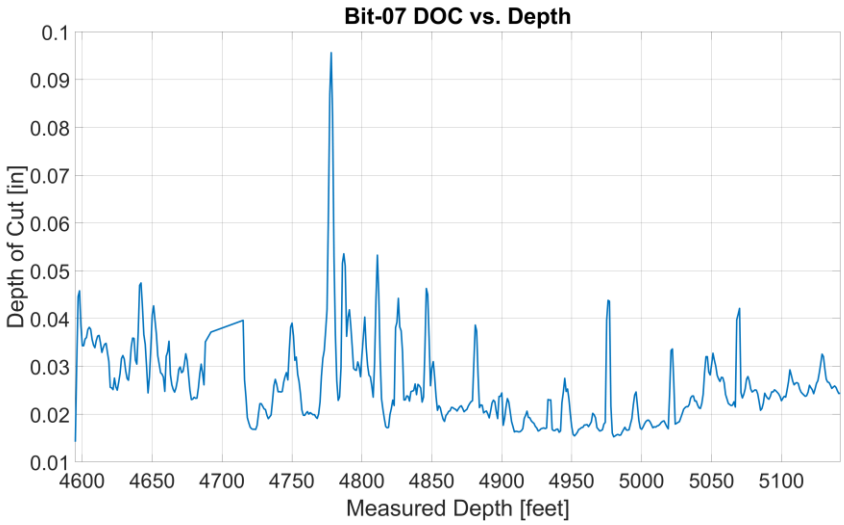
BHA No.	Component	Stab. OD	OD	ID	Length	Cum. Length
1	Jets 3x20 TriCone/TFA .92		8.75	1.5	0.85	0.85
2	7" Motor 6:7 6.5 1.50Fixed	8.5	7		33.07	33.92
3	NMUBHO		6.8125	3.25	3.04	36.96
4	NM STAB	8.5	6.5	3	4.54	41.5
5	NMDC		6.5	3.25	27.81	69.31
6	SHOCK TOOL		6.75		10.69	80
7	12XDC'S		6.5	2.875	368.13	448.13
8	24XHWDP		5	3.25	730.42	1178.55

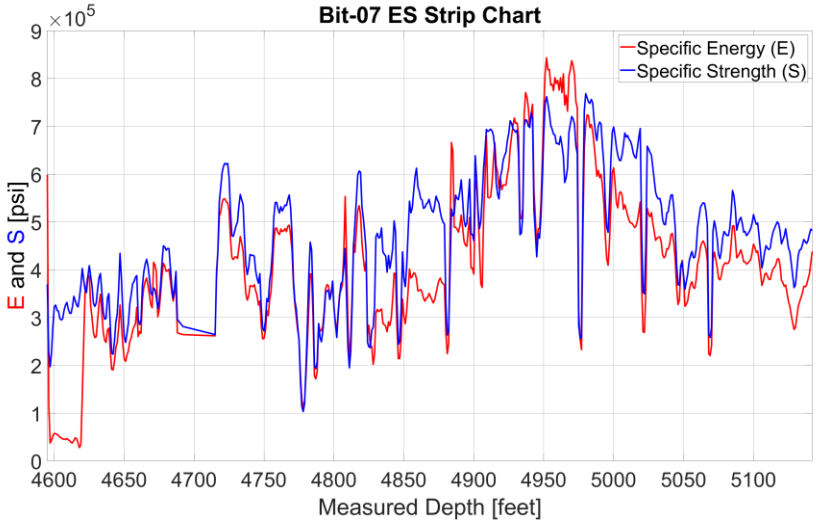
Images:

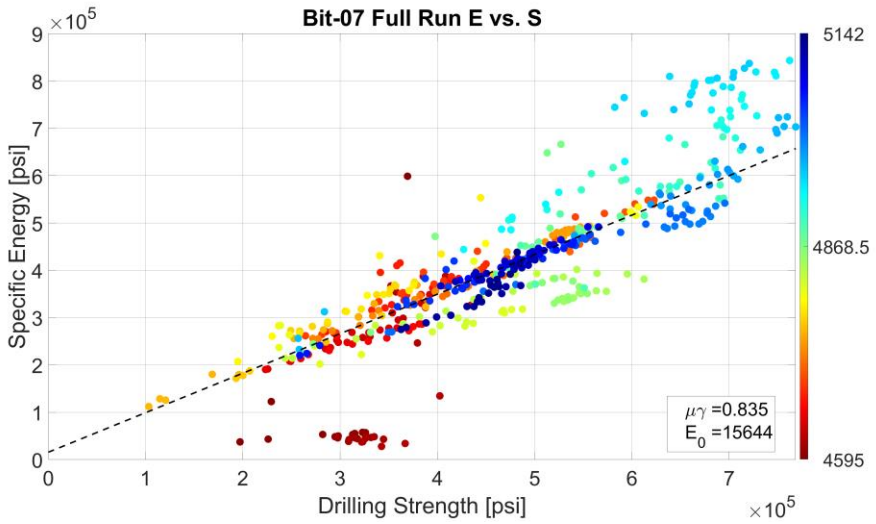
Figure 3-4. Post-drill photo of bit #7.

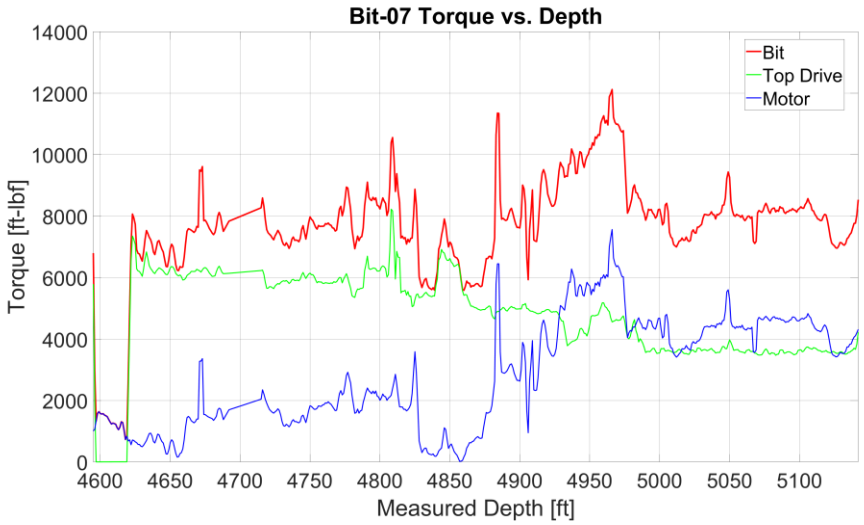
Bit Run Figures:

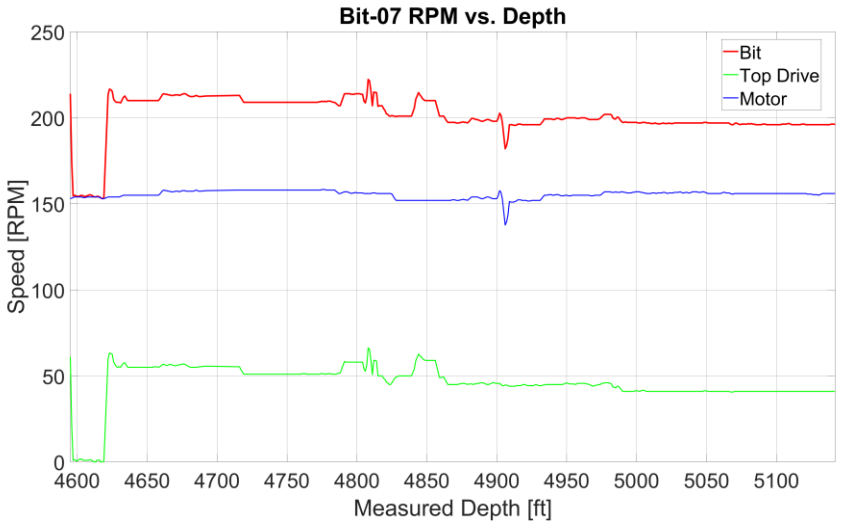







Bit-07 Full Run E vs. S
×10^5
Specific Energy [psi]
Drilling Strength [psi]
×10^5
μγ =0.835
E0 =15644
5142
4868.5
4595


Bit-07 Torque vs. Depth
Torque [ft-lbf]
Measured Depth [ft]
Bit
Top Drive
Motor


Bit-07 RPM vs. Depth
Speed [RPM]
Measured Depth [ft]
Bit
Top Drive
Motor

3.8. Bit-08

Table 3-14: Bit 8 run summary.

Run No.	Run Date	Bit Diameter (in)	Manufacturer	Type	Serial No
8	2/16/2021	8.75	ReedHycalog	TKC63-P1	A277166
BHA No.	**Depth Start (ft)**	**Depth End (ft)**	**Total Footage (ft)**	**Time on Bottom (hrs)**	**Net ROP (ft/hr)**
6	5143	5610	467	15.5	30.1

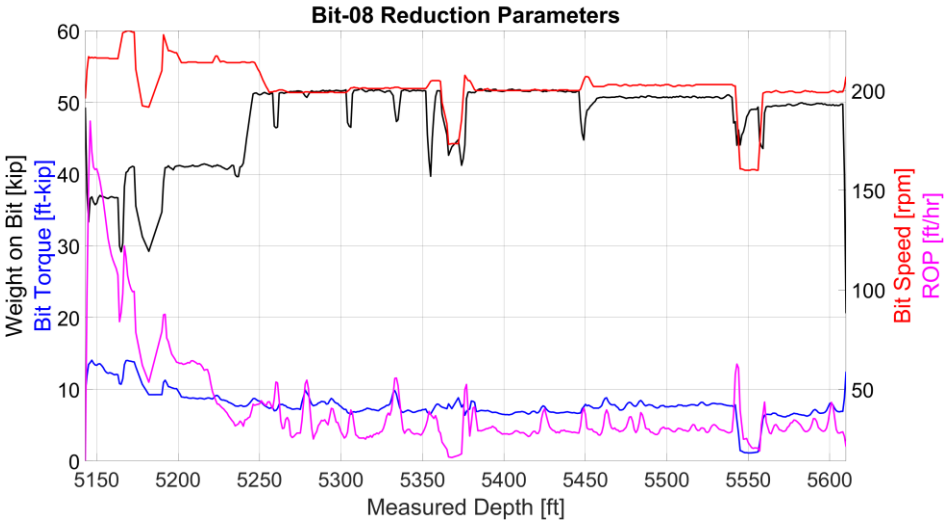
Table 3-15: BHA 6 component makeup.

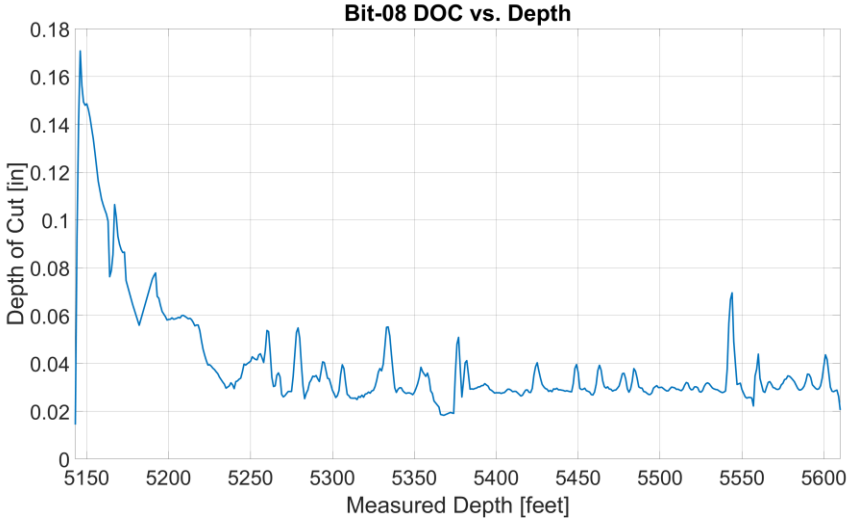
BHA No.	Component	Stab. OD	OD	ID	Length	Cum. Length
1	Jets 6X14 PDC/TFA .902		8.75	1.5	0.85	0.85
2	7" Motor 6:7 6.5 1.50 Fixed	8.5	7		33.02	33.87
3	NMUBHO		6.8125	3.25	3.04	36.91
4	NM STAB	8.5	6.5	3	4.54	41.45
5	NMDC		6.5	3.25	27.81	69.26
6	SHOCK TOOL		6.75		10.69	79.57
7	12XDC'S		6.5	2.875	368.13	448.08
8	24XHWDP		5	3.25	730.42	1178.5

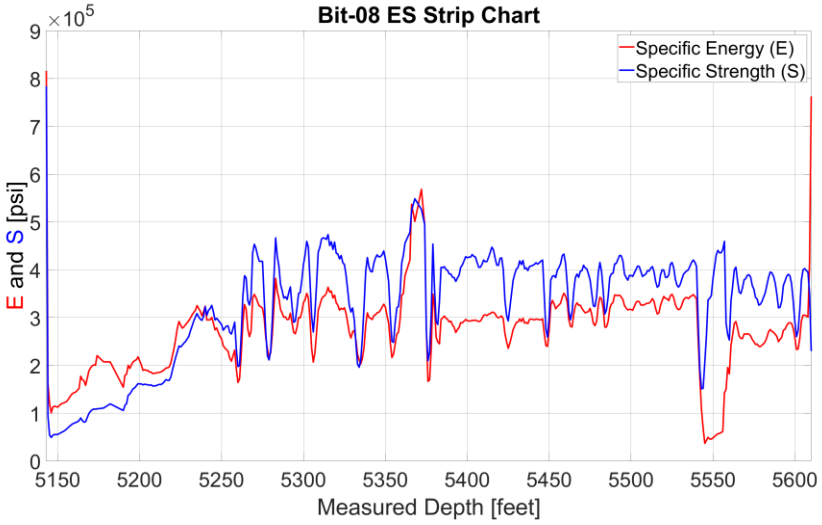
Images:

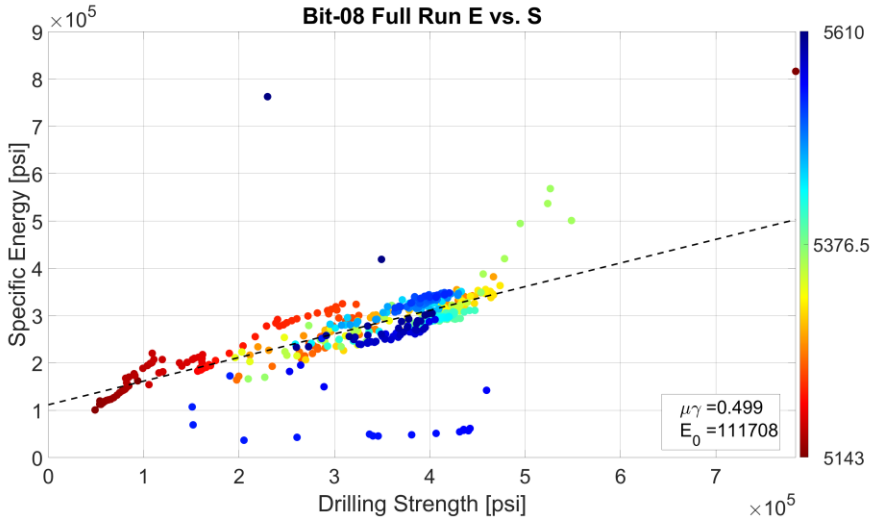
Figure 3-5. Post-drill photo of bit #8.

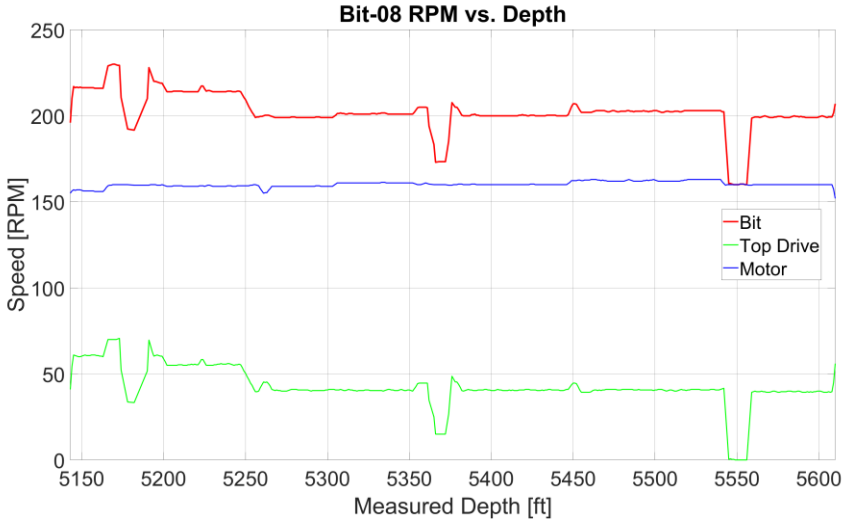
Bit Run Figures:

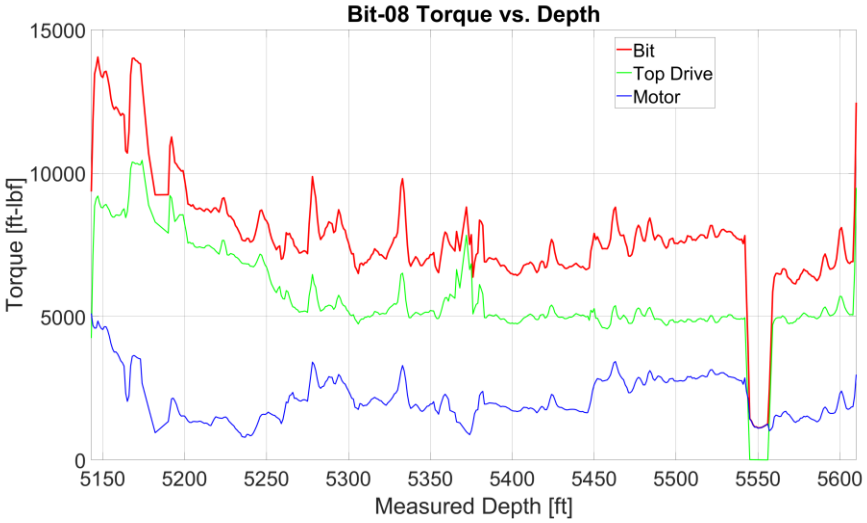







Bit-08 Full Run E vs. S
×10^5
Specific Energy [psi]
Drilling Strength [psi]
×10^5
μγ =0.499
E0 =111708
5610
5376.5
5143


Bit-08 RPM vs. Depth
Speed [RPM]
Measured Depth [ft]
Bit
Top Drive
Motor


Bit-08 Torque vs. Depth
Torque [ft-lbf]
Measured Depth [ft]
Bit
Top Drive
Motor

3.9. Bit-09

Table 3-16: Bit 9 run summary.

Run No.	Run Date	Bit Diameter (in)	Manufacturer	Type	Serial No
9	2/17/2021	8.75	ReedHycalog	TKC63-P1	A271436
BHA No.	**Depth Start (ft)**	**Depth End (ft)**	**Total Footage (ft)**	**Time on Bottom (hrs)**	**Net ROP (ft/hr)**
7	5610	5999	389	14.8	26.3

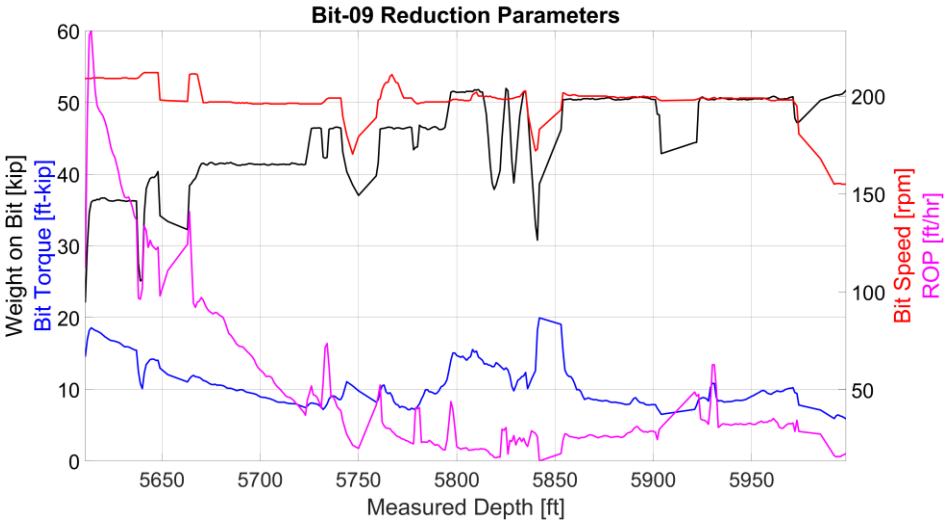
Table 3-17: BHA 7 component makeup.

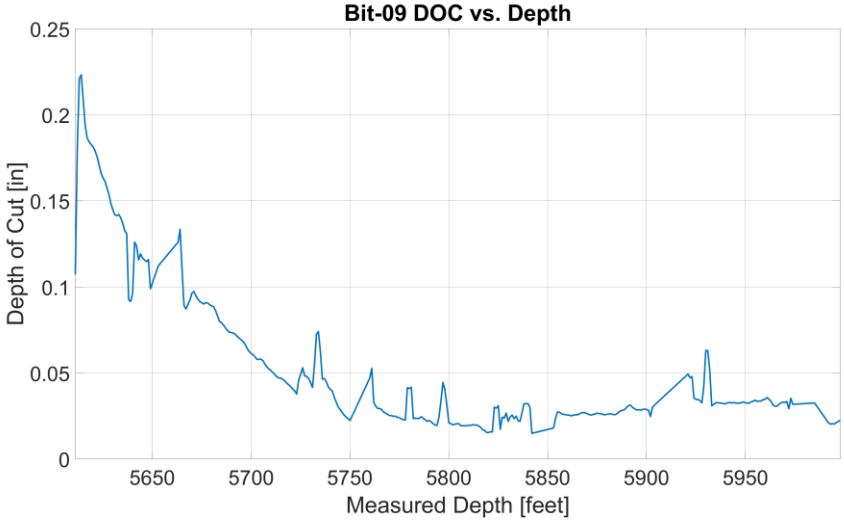
BHA No.	Component	Stab. OD	OD	ID	Length	Cum. Length
1	Jets 3X14 3X13 PDC/TFA .846		8.75	1.5	0.85	0.85
2	7" Motor 6:7 6.5 1.50Fixed	8.5	7		33.07	33.92
3	NMUBHO		6.8125	3.25	3.04	36.96
4	NM STAB	8.5	6.5625	3	5.1	42.06
5	NMDC		6.5	3.25	27.81	69.87
6	SHOCK TOOL		6.875		10.8	80.67
7	12XDC'S		6.5	2.875	368.13	448.8
8	24XHWDP		5	3.25	730.42	1178.22

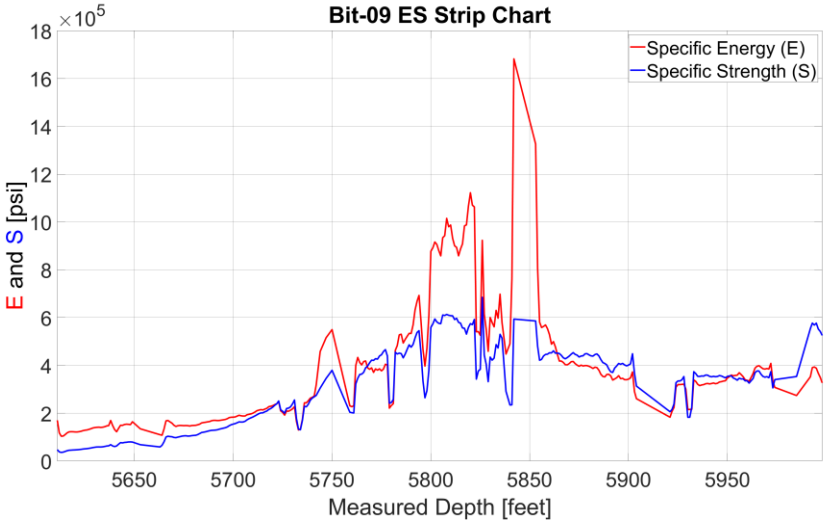
Images:

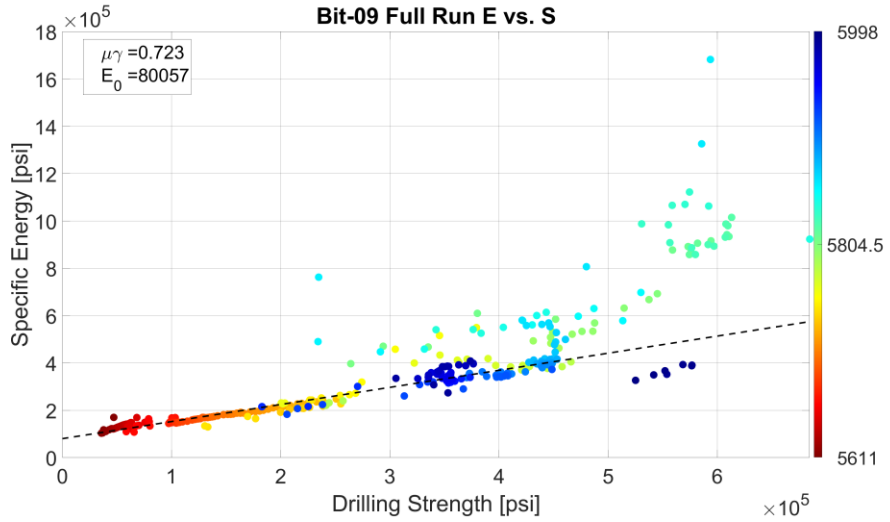
Figure 3-6. Post-drill photo of bit #9.

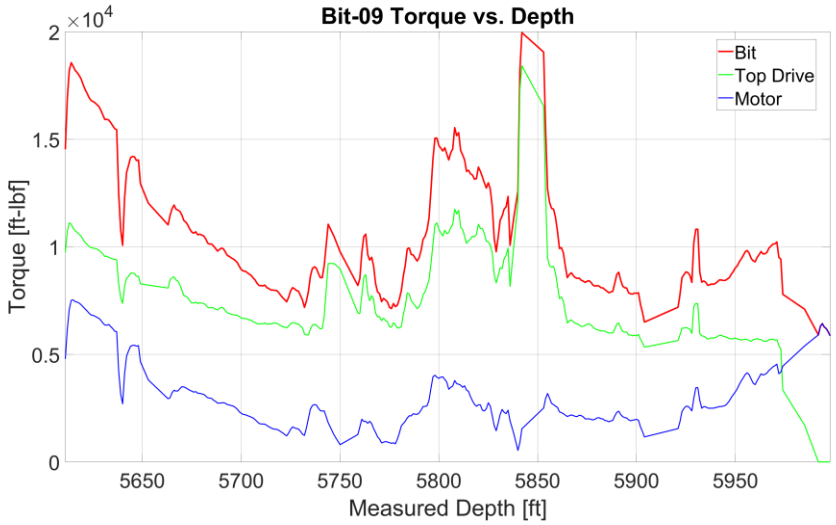
Bit Run Figures:

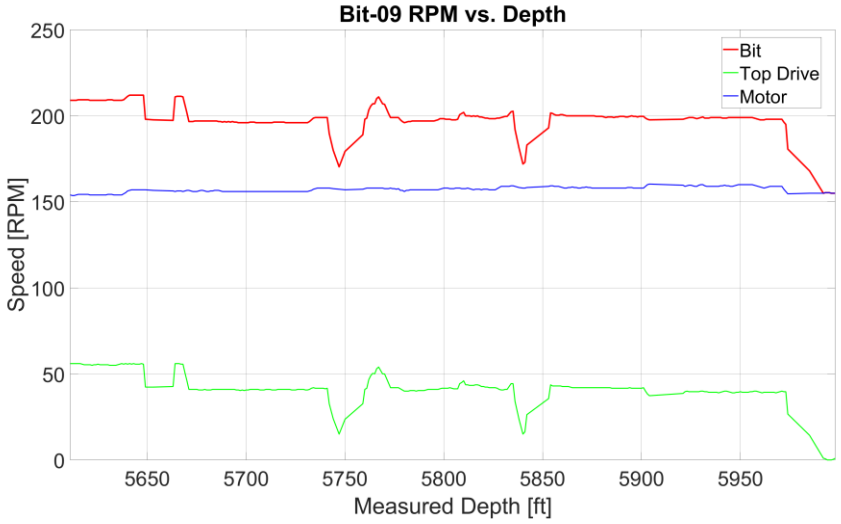







Bit-09 Full Run E vs. S
$\mu\gamma$ =0.723
E_0 =80057
Specific Energy [psi]
Drilling Strength [psi]
×10^5
5998
5804.5
5611


Bit-09 Torque vs. Depth
×10^4
Torque [ft-lbf]
Measured Depth [ft]
Bit
Top Drive
Motor


Bit-09 RPM vs. Depth
Speed [RPM]
Measured Depth [ft]
Bit
Top Drive
Motor

3.10. Bit-10

Table 3-18: Bit 10 run summary.

Run No.	Run Date	Bit Diameter (in)	Manufacturer	Type	Serial No
10	2/18/2021	8.75	ReedHycalog	FTKC73	A275803
BHA No.	**Depth Start (ft)**	**Depth End (ft)**	**Total Footage (ft)**	**Time on Bottom (hrs)**	**Net ROP (ft/hr)**
8	5999	7208	1209	52.1	23.2

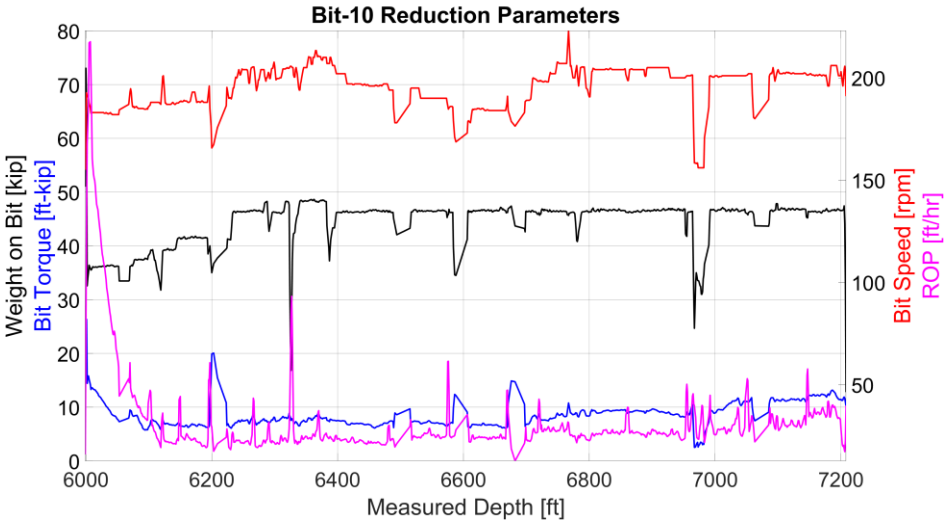
Table 3-19: BHA 8 component makeup.

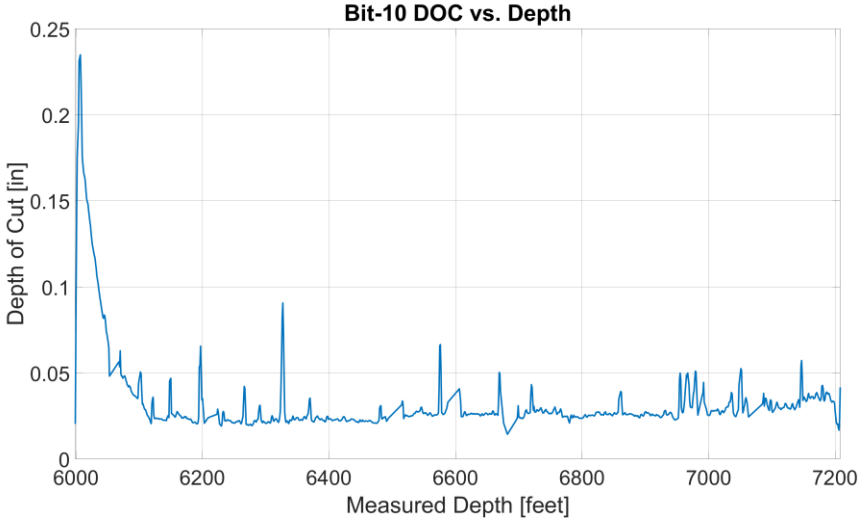
BHA No.	Component	Stab. OD	OD	ID	Length	Cum. Length
1	Jets 3X12 4X13 PDC/TFA .850		8.75	1.5	0.85	0.85
2	7" Motor 7:8 8.5 1.50Fixed	8.5	7		34.24	35.09
3	NMUBHO		6.8125	3.25	3.04	38.13
4	NM STAB	8.5	6.5625	3	4.7	42.83
5	NMDC		6.5	3.25	27.81	70.64
6	12XDC'S		6.5	2.875	368.13	438.77
7	24XHWDP		5	3.25	730.42	1169.19

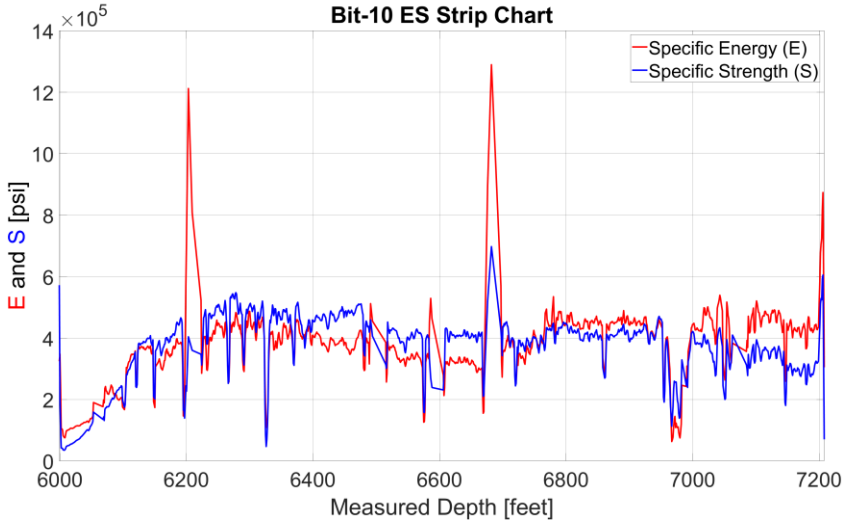
Images:

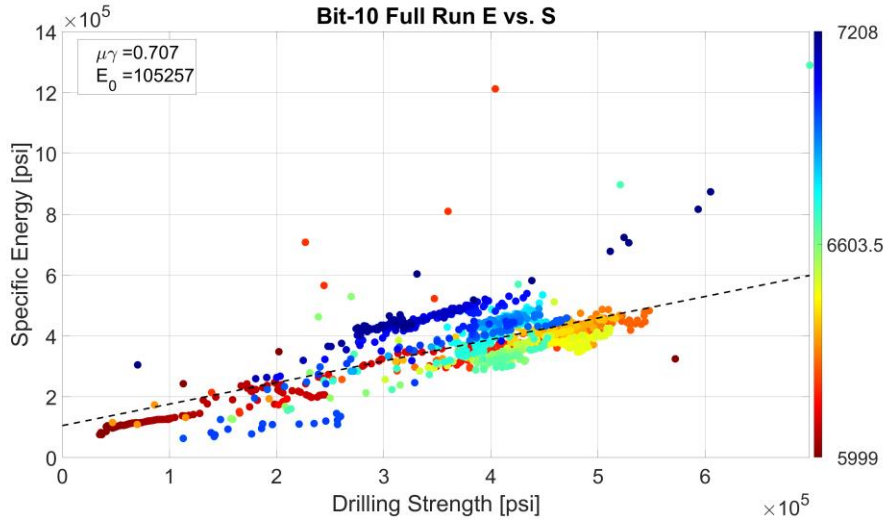
Figure 3-7. Post-drill photo of bit #10.

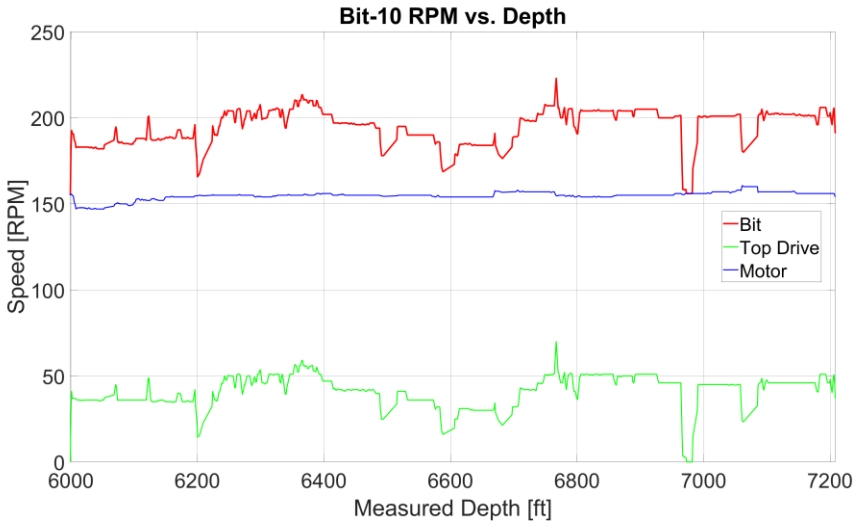
Bit Run Figures:

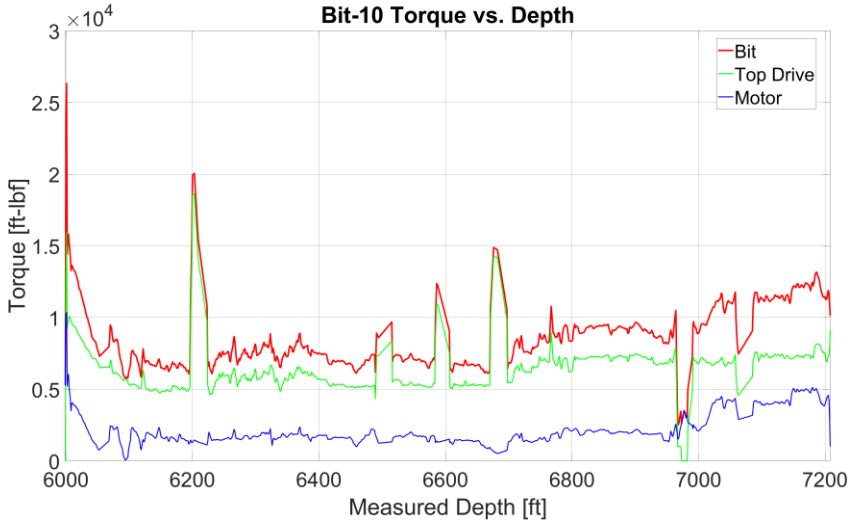







Bit-10 Full Run E vs. S
×10^5
μγ =0.707
E0 =105257
Specific Energy [psi]
Drilling Strength [psi]
×10^5
7208
6603.5
5999


Bit-10 RPM vs. Depth
Speed [RPM]
Measured Depth [ft]
Bit
Top Drive
Motor


Bit-10 Torque vs. Depth
×10^4
Torque [ft-lbf]
Measured Depth [ft]
Bit
Top Drive
Motor

3.11. Bit-11

Table 3-20: Bit 11 run summary.

Run No.	Run Date	Bit Diameter (in)	Manufacturer	Type	Serial No
11	2/20/2021	8.75	ReedHycalog	FTKC63-A1	A276121
BHA No.	**Depth Start (ft)**	**Depth End (ft)**	**Total Footage (ft)**	**Time on Bottom (hrs)**	**Net ROP (ft/hr)**
9	7208	7620	412	4.8	85.8

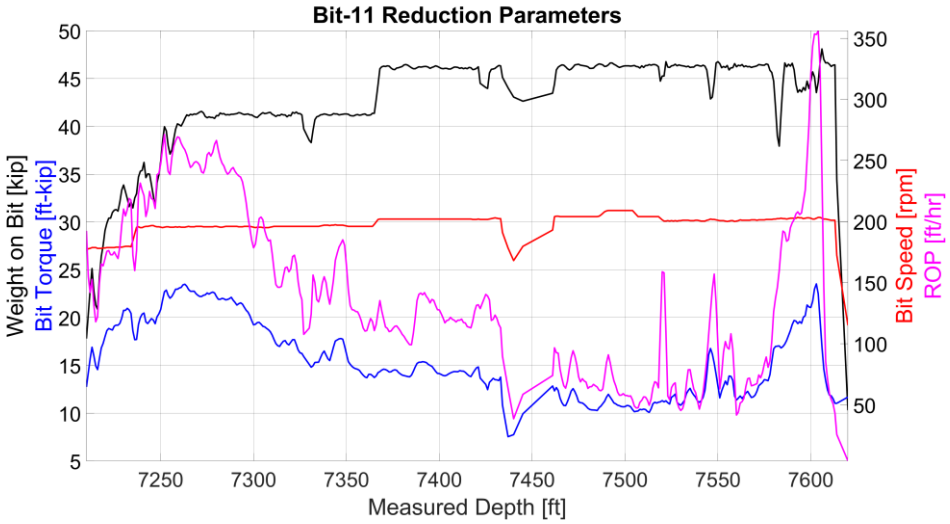
Table 3-21: BHA 9 component makeup.

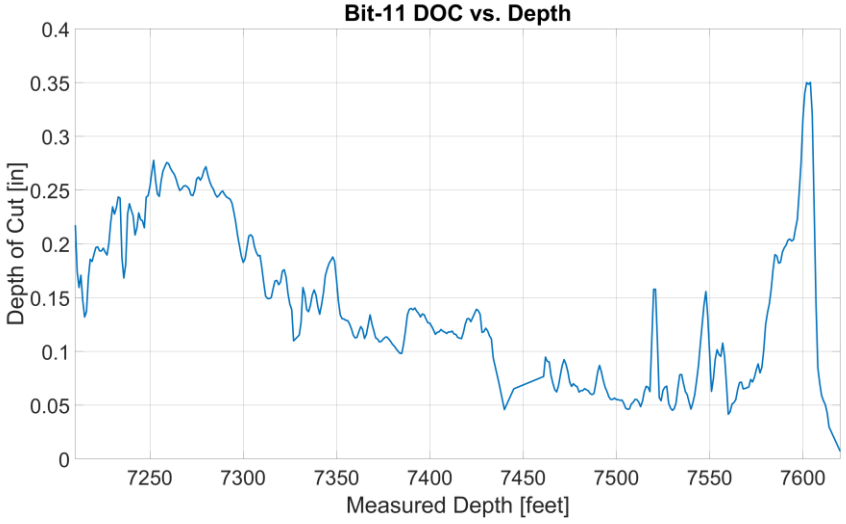
BHA No.	Component	Stab. OD	OD	ID	Length	Cum. Length
1	Jets 3X14 4X13 PDC/TFA .840		8.75	1.5	0.85	0.85
2	7" Motor 7:8 8 6.1 1.50Fixed	8.5	7		30.18	31.03
3	NMUBHO		6.8125	3.25	3.04	34.07
4	NM STAB	8.5	6.5625	2.8125	4.61	38.68
5	NMDC		6.5	3.25	27.81	66.49
6	12XDC'S		6.5	2.875	368.13	434.62
7	24XHWDP		5	3.25	730.42	1165.04

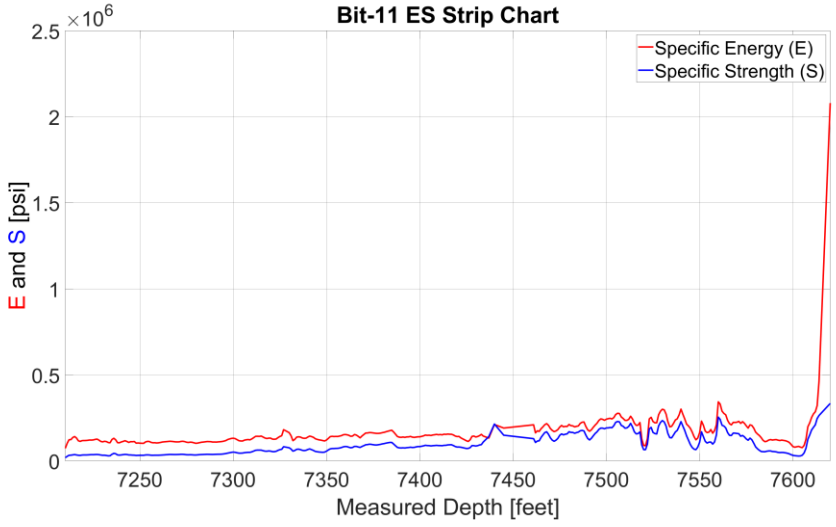
Images:

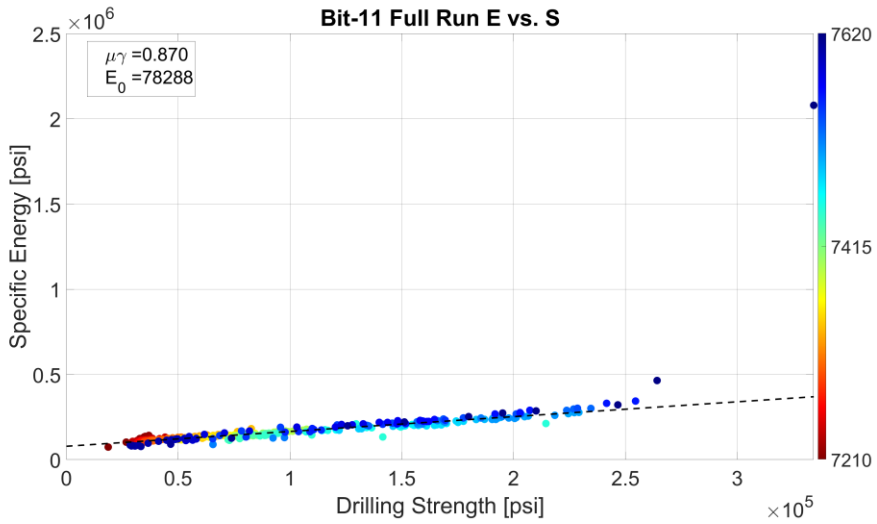
Figure 3-8. Post-drill photo of bit #11.

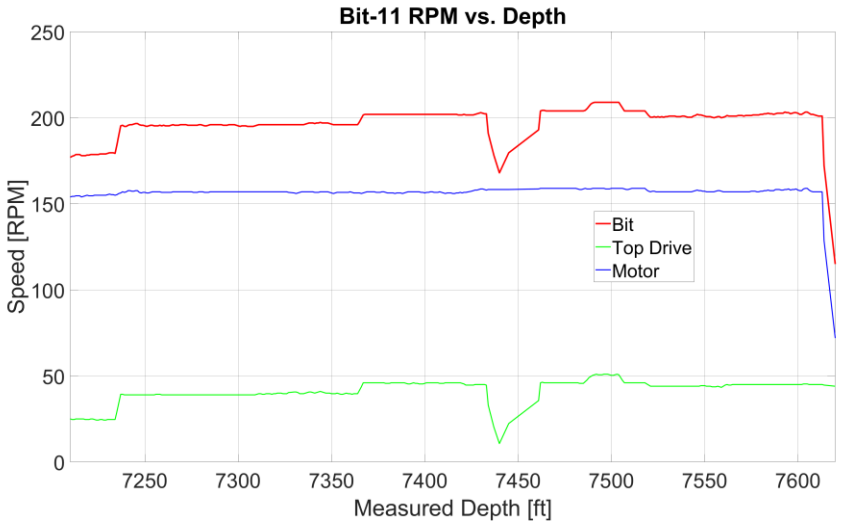
Bit Run Figures:

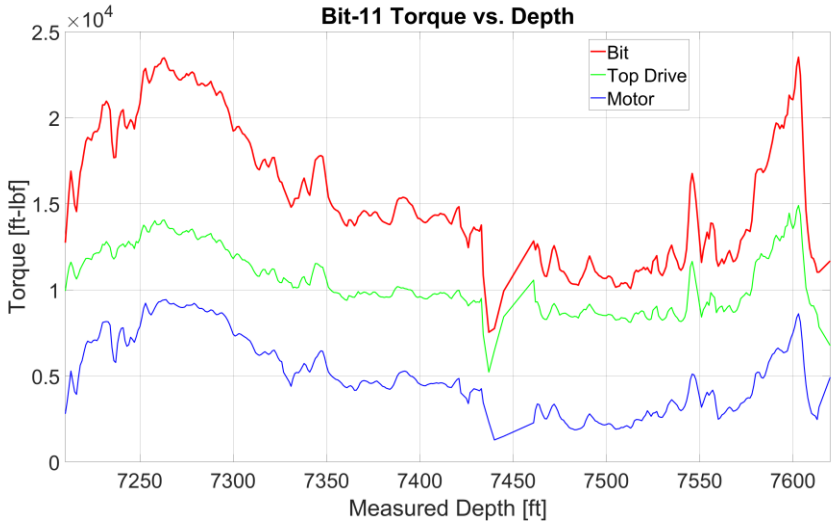







Bit-11 Full Run E vs. S
×10^6
μγ =0.870
E0 =78288
Specific Energy [psi]
Drilling Strength [psi]
×10^5
7620
7415
7210


Bit-11 RPM vs. Depth
Speed [RPM]
Measured Depth [ft]
Bit
Top Drive
Motor


Bit-11 Torque vs. Depth
×10^4
Torque [ft-lbf]
Measured Depth [ft]
Bit
Top Drive
Motor

3.12. Bit-12

Table 3-22: Bit 12 run summary.

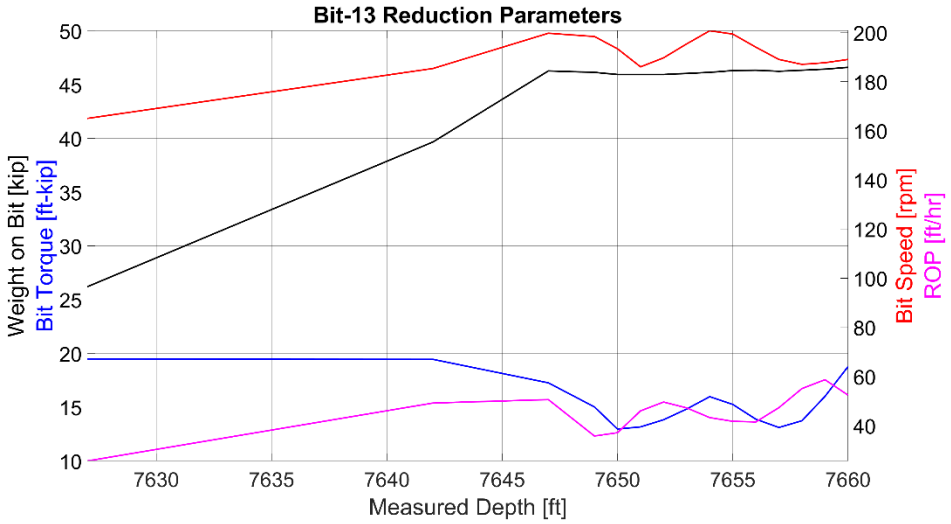
Run No.	Run Date	Bit Diameter (in)	Manufacturer	Type	Serial No
12	2/22/2021	8.75	E6	Hammer	
BHA No.	**Depth Start (ft)**	**Depth End (ft)**	**Total Footage (ft)**	**Time on Bottom (hrs)**	**Net ROP (ft/hr)**
-	7620	7627	7	0.8	10.0

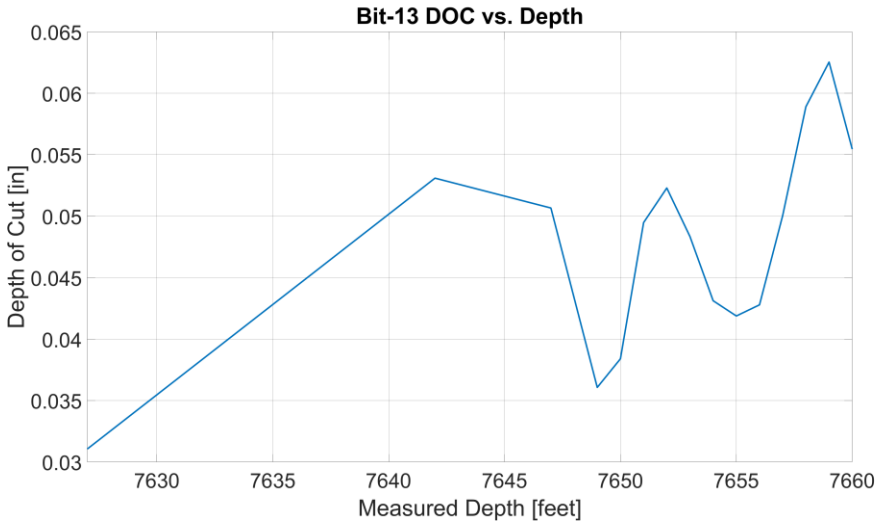
3.13. Bit-13

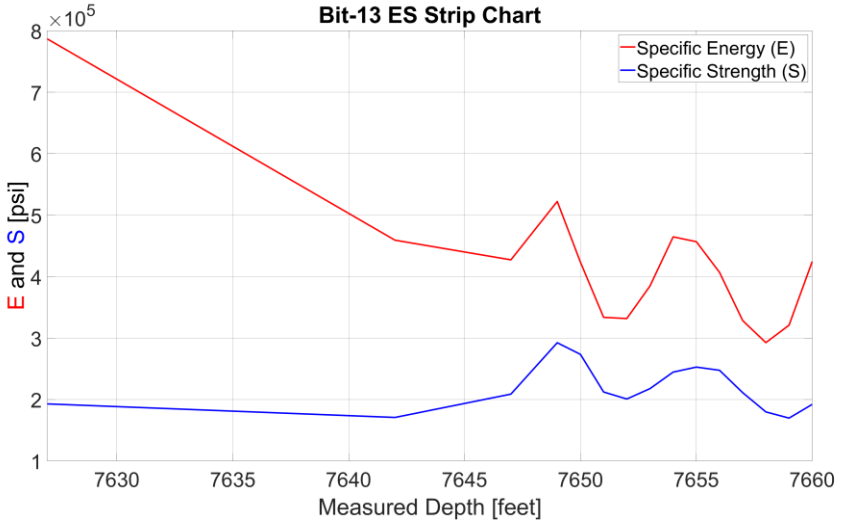
Table 3-23: Bit 13 run summary.

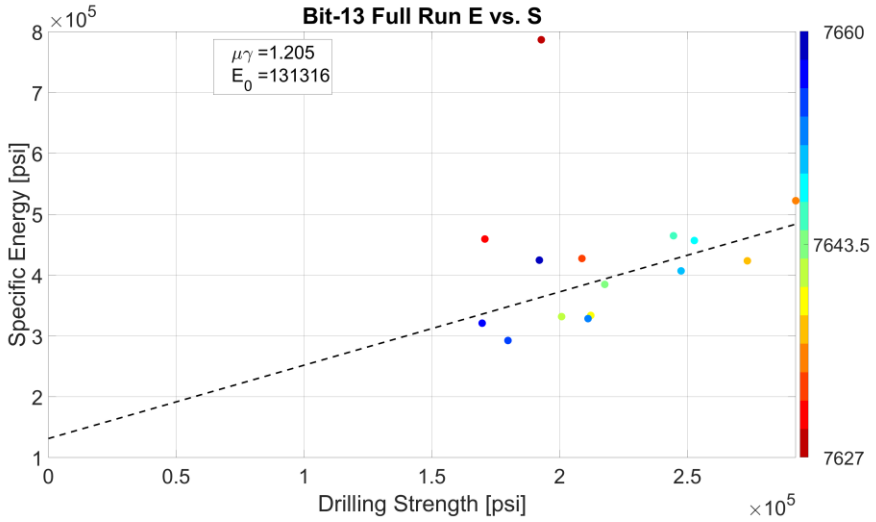
Run No.	Run Date	Bit Diameter (in)	Manufacturer	Type	Serial No
13	2/22/2021	8.75	ReedHycalog	FTKC63-A1	AZ276121
BHA No.	**Depth Start (ft)**	**Depth End (ft)**	**Total Footage (ft)**	**Time on Bottom (hrs)**	**Net ROP (ft/hr)**
-	7627	7662	35	1.1	31.8

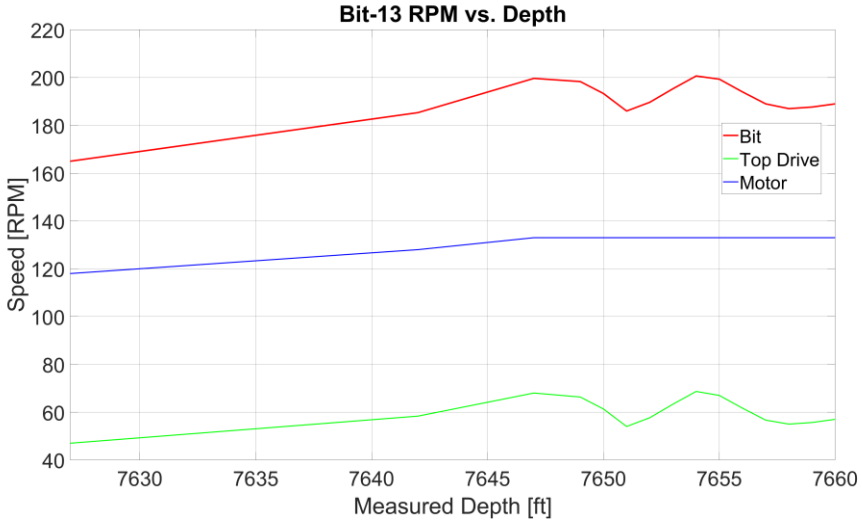
Bit Run Figures:

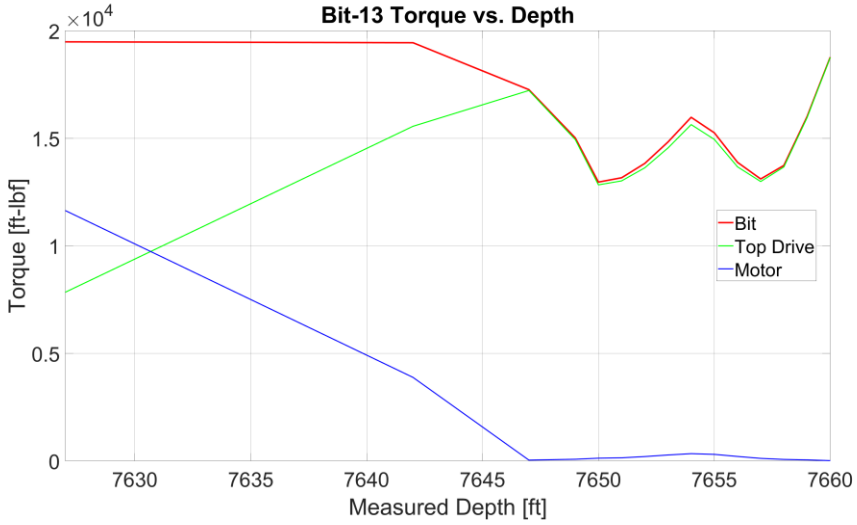







Bit-13 Full Run E vs. S
$\mu\gamma$ =1.205
E_0 =131316
Specific Energy [psi]
Drilling Strength [psi]
×10^5
7660
7643.5
7627


Bit-13 RPM vs. Depth
Speed [RPM]
Measured Depth [ft]
Bit
Top Drive
Motor


Bit-13 Torque vs. Depth
×10^4
Torque [ft-lbf]
Measured Depth [ft]
Bit
Top Drive
Motor

3.14. Bit-14

Table 3-24: Bit 14 run summary.

Run No.	Run Date	Bit Diameter (in)	Manufacturer	Type	Serial No
14	2/23/2021	8.75	E6	MH180-04	
BHA No.	**Depth Start (ft)**	**Depth End (ft)**	**Total Footage (ft)**	**Time on Bottom (hrs)**	**Net ROP (ft/hr)**
-	7663	7667	4	0.8	5.0

3.15. Bit-15

Table 3-25: Bit 15 run summary.

Run No.	Run Date	Bit Diameter (in)	Manufacturer	Type	Serial No
15	2/23/2021	8.75	ReedHycalog	TKC63-P1	A271437
BHA No.	**Depth Start (ft)**	**Depth End (ft)**	**Total Footage (ft)**	**Time on Bottom (hrs)**	**Net ROP (ft/hr)**
10	7666	8900	1234	37.0	33.3

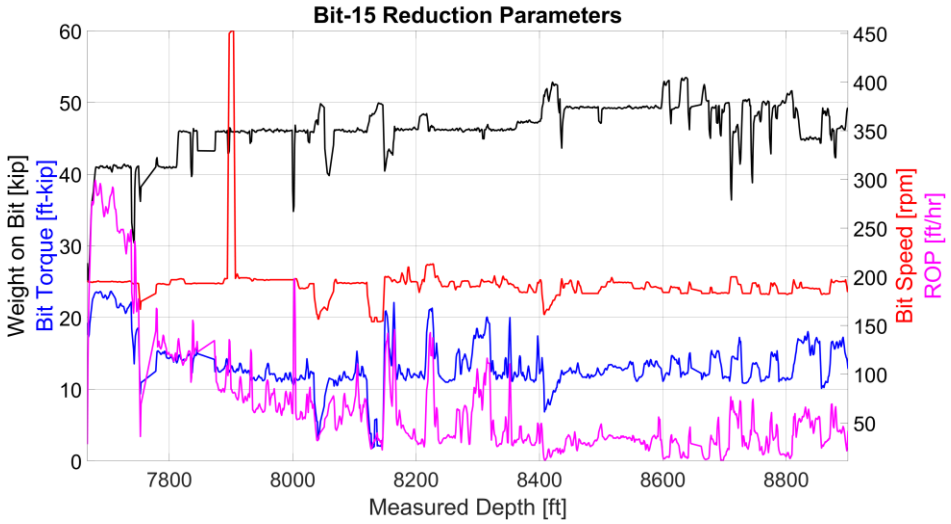
Table 3-26: BHA 10 component makeup.

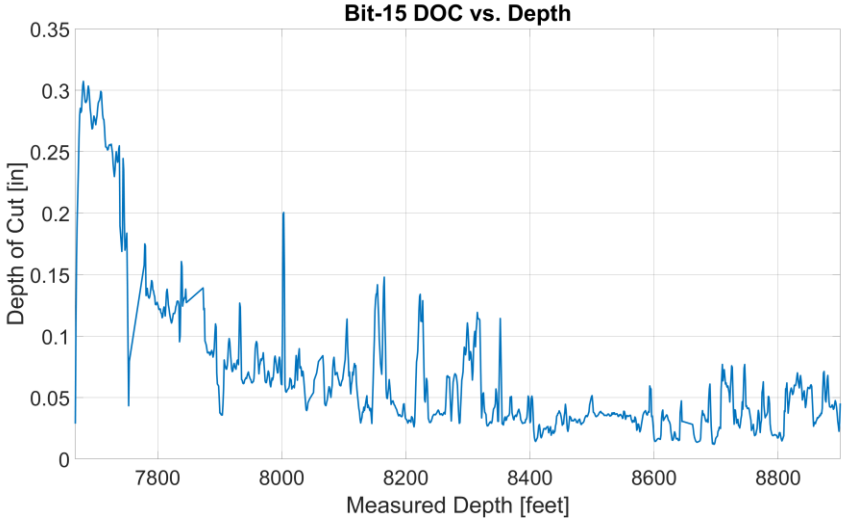
BHA No.	Component	Stab. OD	OD	ID	Length	Cum. Length
1	Jets 3x13 3x14 PDC/TFA .840		8.75	1.5	0.85	0.85
2	7" Motor 7:8 8 6.1 1.50Fixed	8.5	7		30.17	31.02
3	NMUBHO		6.8125	3.25	3.42	34.44
4	NM STAB	8.5	6.5	2.8125	3.2	37.64
5	NMDC		6.5	3.25	27.1	64.74
6	12XDC'S		6.5	2.875	368.05	432.79
7	JARS		6.5	3	33.51	466.3
8	24XHWDP		5	3.25	730.42	1196.72

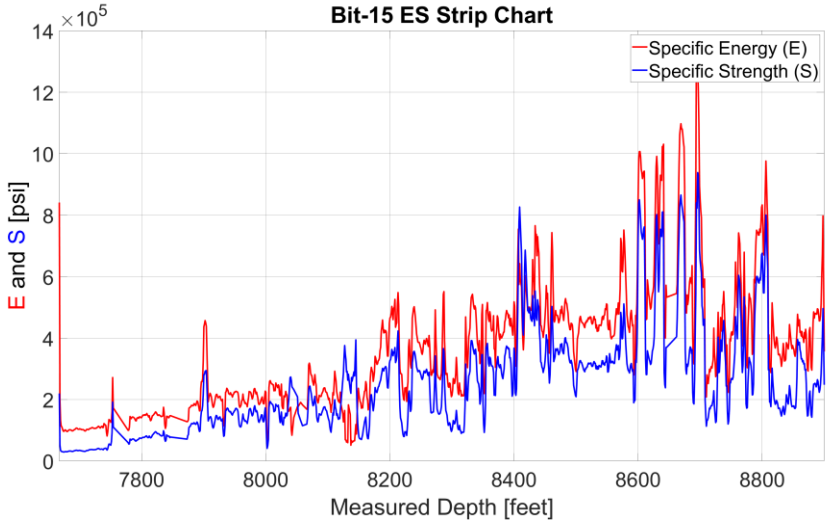
Images:

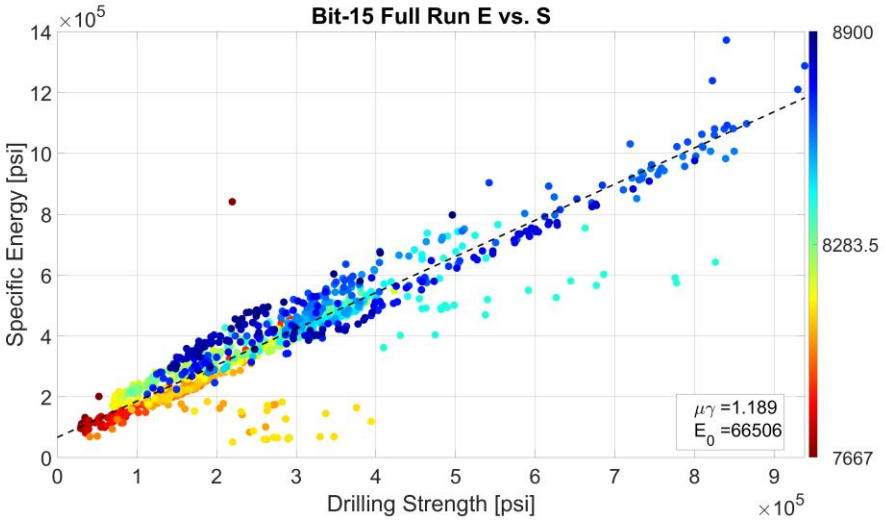
Figure 3-9. Post-drill photo of bit #15.

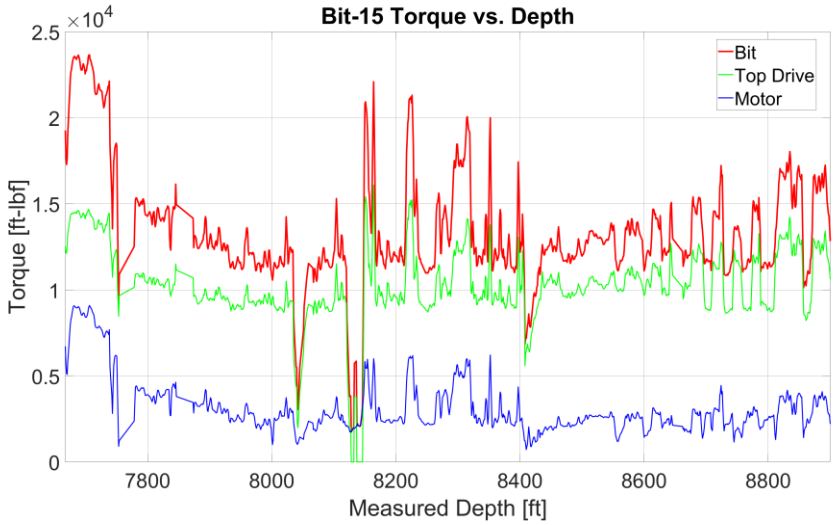
Bit Run Figures:

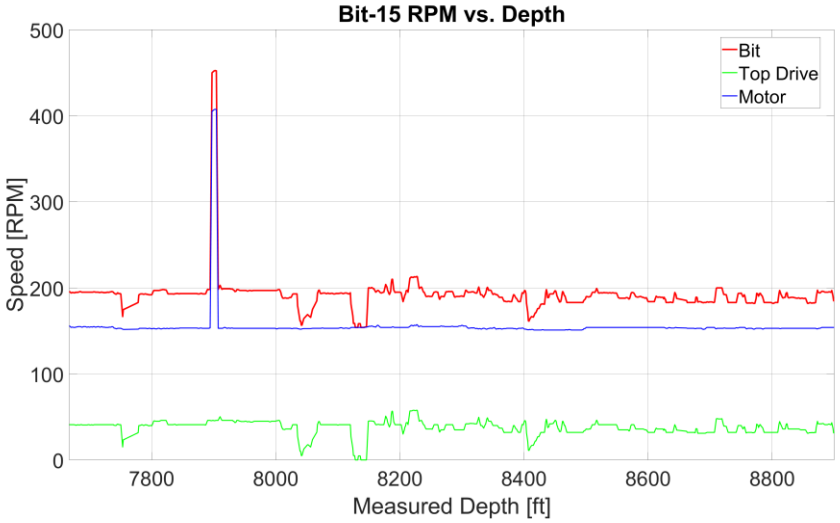







Bit-15 Full Run E vs. S
×10^5
14
12
10
8
6
4
2
0
Specific Energy [psi]
0
1
2
3
4
5
6
7
8
9
Drilling Strength [psi]
×10^5
8900
8283.5
7667
μγ =1.189
E0 =66506


Bit-15 Torque vs. Depth
×10^4
2.5
2
1.5
1
0.5
0
Torque [ft-lbf]
7800
8000
8200
8400
8600
8800
Measured Depth [ft]
Bit
Top Drive
Motor


Bit-15 RPM vs. Depth
500
400
300
200
100
0
Speed [RPM]
7800
8000
8200
8400
8600
8800
Measured Depth [ft]
Bit
Top Drive
Motor

3.16. Bit-16

Table 3-27: Bit 16 run summary.

Run No.	Run Date	Bit Diameter (in)	Manufacturer	Type	Serial No
16	2/26/2021	8.75	ReedHycalog	TKC83-A3	A276071
BHA No.	**Depth Start (ft)**	**Depth End (ft)**	**Total Footage (ft)**	**Time on Bottom (hrs)**	**Net ROP (ft/hr)**
11	8900	9145	245	3.2	76.6

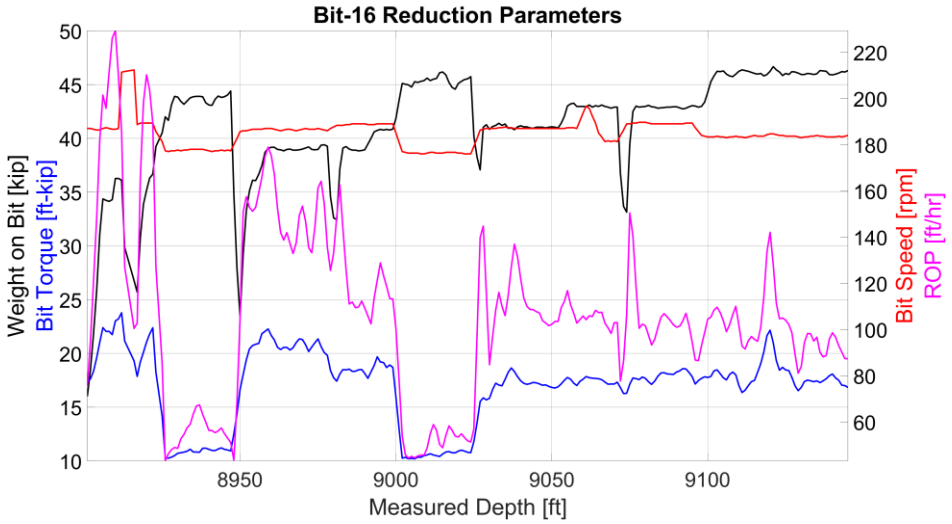
Table 3-28: BHA 10 component makeup.

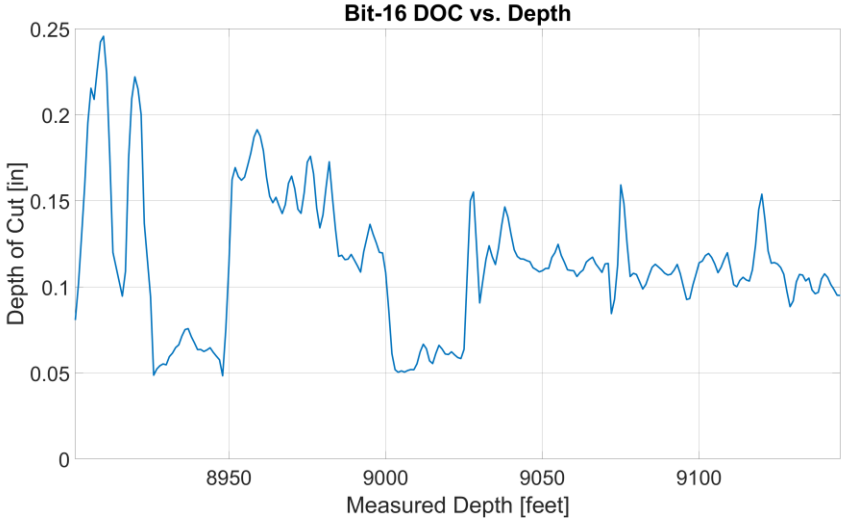
BHA No.	Component	Stab. OD	OD	ID	Length	Cum. Length
1	Jets 4x12 4x11 PDC/TFA .813		8.75	1.5	0.85	0.85
2	7" Motor 7:8 8.5 1.50Fixed	8.5	7		34.28	35.13
3	NMUBHO		6.8125	3.25	3.42	38.55
4	NM STAB	8.5	6.5	2.8125	4.55	43.1
5	NMDC		6.5	3.25	27.1	70.2
6	12XDC'S		6.5	2.875	368.05	438.25
7	JARS		6.5	3	33.51	471.76
8	24XHWDP		5	3.25	730.42	1202.18

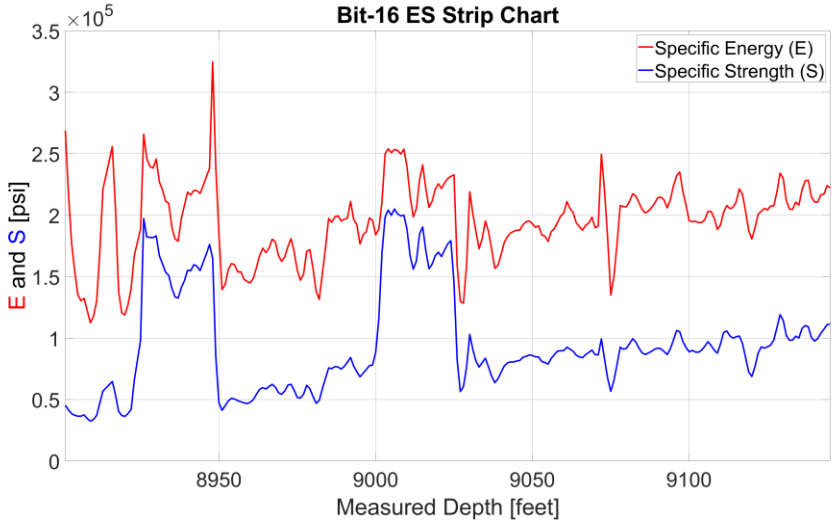
Images:

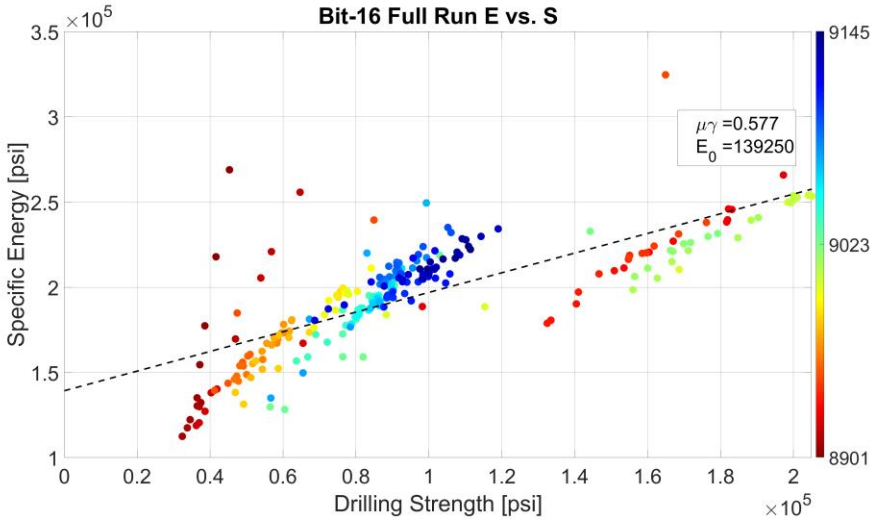
Figure 3-10. Post-drill photo of bit #16.

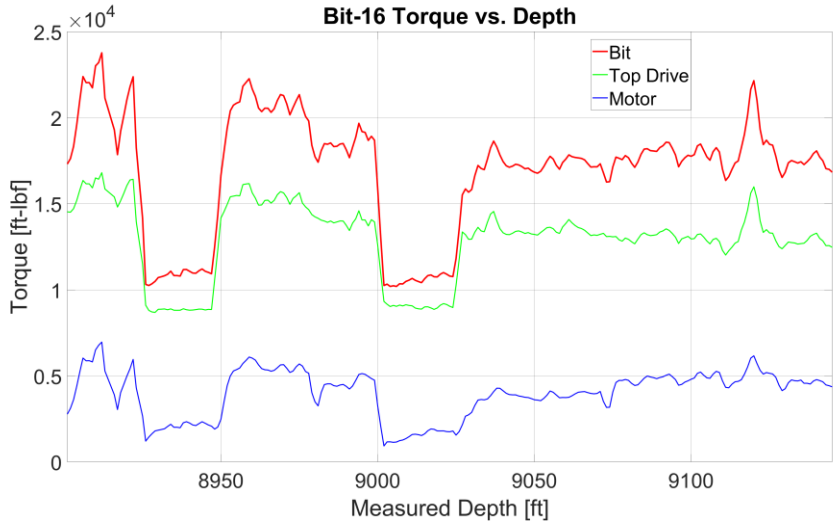
Bit Run Figures:

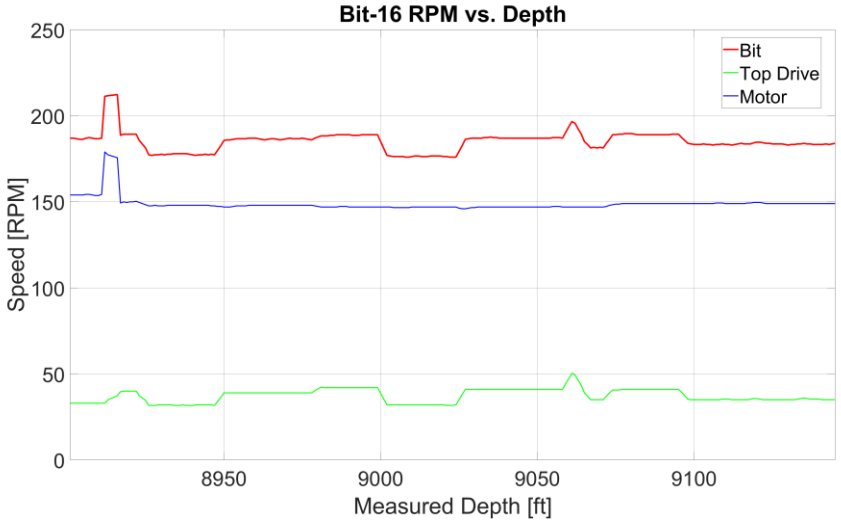







Bit-16 Full Run E vs. S
×10^5
3.5
3
2.5
2
1.5
1
Specific Energy [psi]
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
×10^5
Drilling Strength [psi]
μγ =0.577
E0 =139250
9145
9023
8901


Bit-16 Torque vs. Depth
×10^4
2.5
2
1.5
1
0.5
0
Torque [ft-lbf]
8950
9000
9050
9100
Measured Depth [ft]
Bit
Top Drive
Motor


Bit-16 RPM vs. Depth
250
200
150
100
50
0
Speed [RPM]
8950
9000
9050
9100
Measured Depth [ft]
Bit
Top Drive
Motor

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[11] Scientific Drilling, End of Well Report, Utah FORGE 16B(78)-32, June 2023

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APPENDIX A. DAILY DRILLING REPORTS

Daily Drilling Report

Well ID: Forge 56-32
Field: Other

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 2 **Report For 06-Feb-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**		**Daily Cost / Mud ($):**			---
Measured Depth (ft):	128	**Last Casing:**	20.000 at 129	**Wellbore:**	Original Wellbore	**AFE No.**	**AFE ($)**		**Actual ($)**
Vertical Depth (ft):	128	**Next Casing:**	13.375 at 350	**RKB Elevation (ft):**	28.50	---	---		---
Proposed TD (ft):	9000	**Last BOP Test:**		**Job Reference RKB (ft):**	28.50	---	---		---
Hole Made (ft) / Hrs:	0 / 0.0	**Next BOP Test:**		**Working Interest:**		**Totals:**	---		---
Average ROP (ft/hr):						**Well Cost ($):**			---
Drilling Days (act./plan):	0/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	0/38	**Days On Location:**			2
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 168	**Service:**	23 / 276	**Other:**	0 / 0	**Total:**	39 / 468

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Safety meeting and initiating final rig up.

Planned Operations: Rig up on Forge 16A.

Toolpusher: Justin Bristol, Steve Caldwell

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	6:00	6.00	128	OTHER	Wait on Day Light.	
6:00	18:00	12.00	128	RIGU	Set in place rig components and heavy loads, Draw works, A-Frame, Derrick and strung blocks. Raised derrick. Rigged up equipment.	
18:00	0:00	6.00	128	OTHER	Wait on Day Light.	

Management Summary

Set in all major components of Frontier's Rig 16 including sub-base, draw works, A-Frame and derrick. Raised derrick and continued nipple up.

Comments

Rig is 100% moved and 40% rigged up. Expected spud late 2-7-2021 or early 2-8-21.

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	29		129						

Safety Information

Meetings/Drills	Time	Description
Safety	30	Rig Move, safety belts, pinch points and working in teams.

First Aid Treatments: **Medical Treatments:** **Lost Time Incidents:** **Days Since LTI:**

☐ **BOP Test** ☐ **Crownamatic Check**

Weather Information

Sky Condition:	Clear	**Visibility:**	10
Air Temperature:	21 degF	**Bar. Pressure:**	30.03
Wind Speed/Dir:	15 / N	**Wind Gusts:**	25

Daily Drilling Report

Well ID: Forge 56-32
Field: Other

Geothermal Resource Group, Inc.

Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 3 **Report For 07-Feb-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**		**Daily Cost / Mud ($):**		---
Measured Depth (ft):	128	**Last Casing:**	20.000 at 129	**Wellbore:**	Original Wellbore	**AFE No.**	**AFE ($)**	**Actual ($)**
Vertical Depth (ft):	128	**Next Casing:**	13.375 at 350	**RKB Elevation (ft):**	28.50	---	---	---
Proposed TD (ft):	9000	**Last BOP Test:**		**Job Reference RKB (ft):**	28.50	---	---	---
Hole Made (ft) / Hrs:	0 / 0.0	**Next BOP Test:**		**Working Interest:**		**Totals:**	---	---
Average ROP (ft/hr):						**Well Cost ($):**		---
Drilling Days (act./plan):	0/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	0/38	**Days On Location:**		3
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 168	**Service:**	1 / 12	**Other:**	0 / 0	**Total:** 17 / 204

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Morning Safety meeting.

Planned Operations: Plan to bring in and strap drill pipe and casing. Install riser pipe, mix mud and prepare to spud.

Toolpusher: Justin Bristol, Steve Caldwell

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	6:00	6.00	128	OTHER	Waited on Day Light.	
6:00	18:00	12.00	128	RIGU	Set in Top Drive and track, wind walls and nippled up equipment.	
18:00	0:00	6.00	128	OTHER	Waited on Day Light.	

Management Summary

Continued rig up. Installed top drive unit, wind walls, connected mud and air lines. Set in fresh water tank. Rigged up solids control unit.

Comments

Rig is 100% moved and 80% rigged up. Expected spud late 2-7-2021 or early 2-8-21.

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	29		129						

Safety Information

Meetings/Drills	Time	Description
Safety	30	Working in dark spots, pinch points and team work during rig moves.

First Aid Treatments: **Medical Treatments:** **Lost Time Incidents:** **Days Since LTI:**

☐ BOP Test ☐ Crownamatic Check

Weather Information

Sky Condition:	Clear	**Visibility:**	10
Air Temperature:	27 degF	**Bar. Pressure:**	29.97
Wind Speed/Dir:	15 / SSW	**Wind Gusts:**	20

Daily Drilling Report

Well ID: Forge 56-32
Field: Other

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 4 **Report For 07-Feb-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**		**Daily Cost / Mud ($):**			---
Measured Depth (ft):	128	**Last Casing:**	20.000 at 129	**Wellbore:**	Original Wellbore	**AFE No.**	**AFE ($)**		**Actual ($)**
Vertical Depth (ft):	128	**Next Casing:**	13.375 at 350	**RKB Elevation (ft):**	30.40	---	---		---
Proposed TD (ft):	9000	**Last BOP Test:**		**Job Reference RKB (ft):**	28.50	---	---		---
Hole Made (ft) / Hrs:	0 / 0.0	**Next BOP Test:**		**Working Interest:**		**Totals:**	---		---
Average ROP (ft/hr):						**Well Cost ($):**			---
Drilling Days (act./plan):	0/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	0/38	**Days On Location:**			4
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 168	**Service:**	8 / 96	**Other:**	0 / 0	**Total:**	24 / 288

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Drilled 17-1/2" hole to 380' casing point, circulating well bore clean for casing run.

Planned Operations: Drill 17-1/2" hole to 380.5' and circulate well bore clean. POH and run 13.-3/8" casing and cement in place.

Toolpusher: Justin Bristol, Steve Caldwell

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	6:00	6.00	128	WOD	Wait on Day Light	
6:00	10:30	4.50	128	OTHER	Pre-Spud Inspection of Rig	
10:30	17:00	6.50	128	3-34-1	Picked up 112 joints (37 stands) 5" DP and stood back in derrick. Strapp.ed, OD, ID, FN 24 joints of HWDP and nine 8" DC	
17:00	17:30	0.50	128	SERV	Serviced Rig and Top Drive.	
17:30	21:00	3.50	128	3-34-1	Picked up 7 stands of HWDP and 3 stands of 8" DC	
21:00	22:30	1.50	128	OTHER	Cleaned and strapped 13-3/8" casing.	
22:30	23:00	0.50	128	OTHER	Cleaned Rig floor.	
23:00	0:00	1.00	128	3-34-3	Picked up directional tools.	

Management Summary

Waited on Day Light and conducted Pre-Spud Rig Inspection. Picked up 112 joint (37 Stands) of 5" DP and stood back in derrick. Strapped, OD, ID and Fishing Neck of HWDP. Picked up 7 stands of HWDP and stood back in Derrick. Cleaned and strapped 13-3/8" Casing. Made up Directional tools.

Comments

Rig on "Day Rate" at 0600 hours, 2-7-2021.

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30		129						

Mud Information

Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	% Solids	% Oil	% Water	% Sand	LGS	Cl	Ca	CaCl	Gels 10s	Gels 10m	Gels 30m	Temp In	Temp Out	Mud Loss
07-Feb-21 22:00 at Depth 128 ft																				
8.30	26					8		0				900								

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Gel - OTHER	145	---	lime - OTHER	2	---
micro c - OTHER	32	---	soda ash - OTHER	10	---

Rig Information

Equipment Problems:

Location Condition:

Transport:

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5	112	19.5	S-135	4.5IF					

Daily Drilling Report

Well ID: Forge 56-32
Field: Other

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 4 **Report For 07-Feb-21**

Safety Information

Meetings/Drills	Time	Description
Safety	30	Mixing chemical, pinch points, running casing.

First Aid Treatments:	Medical Treatments:	Lost Time Incidents:	Days Since LTI:

☐ BOP Test ☐ Crownamatic Check

Weather Information

Sky Condition:	Clear	**Visibility:**	10
Air Temperature:	30 degF	**Bar. Pressure:**	29.92
Wind Speed/Dir:	14 / S	**Wind Gusts:**	17

Daily Drilling Report

Well ID: Forge 56-32
Field: Other

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 5 **Report For 08-Feb-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**		**Daily Cost / Mud ($):**			---
Measured Depth (ft):	381	**Last Casing:**	13.375 at 382	**Wellbore:**	Original Wellbore	**AFE No.**	**AFE ($)**		**Actual ($)**
Vertical Depth (ft):	381	**Next Casing:**	9.625 at 3,500	**RKB Elevation (ft):**	30.40	---	---		---
Proposed TD (ft):	9000	**Last BOP Test:**		**Job Reference RKB (ft):**	28.50	---	---		---
Hole Made (ft) / Hrs:	253 / 2.0	**Next BOP Test:**		**Working Interest:**		**Totals:**	---		---
Average ROP (ft/hr):	126.5					**Well Cost ($):**			---
Drilling Days (act./plan):	1/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	1/38	**Days On Location:**			5
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 168	**Service:**	11 / 124	**Other:**	0 / 0	**Total:**	27 / 316

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Testing BOPE

Planned Operations: Test Bope, make up DA and clean out float, cement and shoe, make 10' of new hole and perform FIT. Drill 12 1/4" hole vertically to 3,500' +/-.

Toolpusher: Justin Bristol, Steve Caldwell

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	1:00	1.00	128	10-6-1	Picked up directional tools.	
1:00	1:30	0.50	128	OTHER	Installed rotating head rubber.	
1:30	2:00	0.50	128	03-051	Filled pipe and hole.	
2:00	4:00	2.00	128	REPR	Trouble shot and replaced swivel packing.	X
4:00	4:30	0.50	128	OTHER	Changed rotating head rubber	
4:30	6:00	1.50	381	03-021	Drilled 17-1/2" hole from 128' to 380.5'.	
6:00	6:30	0.50	381	03-051	Circulated well bore clean.	
6:30	7:00	0.50	381	WIPE	Wiper Trip.	
7:00	7:30	0.50	381	03-051	Circulated well bore clean.	
7:30	8:00	0.50	381	3-6-2	Pulled out of the hole.	
8:00	9:00	1.00	381	11-344	Laid down BHA.	
9:00	12:00	3.00	381	4-12-1	Rigged up and ran 13-3/8", 54.5 ppf, J-55 buttress casing with shoe set at 381'.	
12:00	13:30	1.50	381	5-12-2	Rigged up cementers and circulated hole clean.	
13:30	14:30	1.00	381	5-12-2	Pumped 10 bbls of water ahead followed by 30 bbls of10.5 sepiolite preflush plus 13 barrels of sodium silicate, 5 bbls of fresh water spacer followed by 79 bbls of 14 ppg RC Thermalite-a cement, dropped wiper plug and displaced with 52.25 bbls of water and bumped plug with 500 psi over. CIP at 1430 hours.	
14:30	21:00	6.50	381	5-13	Waited on cement. Cut off 20" conductor and 13.375" casing.	
21:00	0:00	3.00	381	6-35	Attempted to install well head, had wrong energizer ring, removed and installed new dies and energizer ring. Tested seals, packed off and pulled tested to 10k. Installed casing valves.	

Management Summary

Drilled 17-1/2" hole from 228' to 380'. Circulated hole clean and wiped hole. Circulated well bore clean and pulled out laying down tools. Rigged up and ran 9 joints of 54.5 ppf, J-55 Buttress casing setting shoe at 380. Rigged up Resource cementing and cemented casing in place. Cut off conductor and sized 13-3/8" casing. Attempted to install well head. Replaced dies and energizer seal and installed well head.

Comments

Good cement to surface.

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	

Mud Information

Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids %	Oil %	Water %	Sand %	LGS %	Cl	Ca	CaCl	Gels 10s	Gels 10m	Gels 30m	Temp In	Temp Out	Mud Loss
08-Feb-21 08:00 at Depth 380 ft																				
8.70	52	15	24	9	1	10	4	0	96	1.5		1000	1480		5	12	22	65	85	

Daily Drilling Report

Well ID: Forge 56-32
Field: Other

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 5 **Report For 08-Feb-21**

Rig Information

Equipment Problems:
Location Condition:
Transport:

Bulk Inventory

Item Type	Units	Beginning	Used	Received	On Hand	Net
Rig Fuel	GALS	9,282	886		8,396	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5	112	19.5	S-135	4.5IF					

Safety Information

Meetings/Drills	Time	Description
Safety	60	Nippling and testing BOPE

First Aid Treatments: **Medical Treatments:** **Lost Time Incidents:** **Days Since LTI:**

☐ **BOP Test** ☐ **Crownamatic Check**

Weather Information

Sky Condition:	Clear	**Visibility:**	10
Air Temperature:	37 degF	**Bar. Pressure:**	29.94
Wind Speed/Dir:	17 / S	**Wind Gusts:**	20

Daily Drilling Report

Well ID: Forge 56-32
Field: Other

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 6 **Report For 09-Feb-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**		**Daily Cost / Mud ($):**			---
Measured Depth (ft):	2500	**Last Casing:**	13.375 at 382	**Wellbore:**	Original Wellbore	**AFE No.**	**AFE ($)**		**Actual ($)**
Vertical Depth (ft):	2500	**Next Casing:**	9.625 at 3,500	**RKB Elevation (ft):**	30.40	---	---		---
Proposed TD (ft):	9000	**Last BOP Test:**		**Job Reference RKB (ft):**	28.50	---	---		---
Hole Made (ft) / Hrs:	2,119 / 9.0	**Next BOP Test:**		**Working Interest:**		**Totals:**	---		---
Average ROP (ft/hr):	235.44					**Well Cost ($):**			---
Drilling Days (act./plan):	2/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	2/38	**Days On Location:**			6
Pers/Hrs:	**Operator:** 2 / 24	**Contractor:**	14 / 168	**Service:**	2 / 24	**Other:**	2 / 24	**Total:**	20 / 240

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Circulating the well bore clean at 3,270' preparing for a wiper trip to the shoe.

Planned Operations: Continue to drill 12-1/4" hole to casing point at 3,500'+/-. Run 9-5/8" casing.

Toolpusher: Justin Bristol, Steve Caldwell

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	1:00	1.00	381	1-14	Installed valves on well head and tightened.	
1:00	5:30	4.50	381	1-14	Insstalled spool, mud cross, double gates, annular, flow spool, choke line, choke hose and torqued all flanges.	
5:30	10:30	5.00	381	1-15	Tested BOPE system, emailed results to DWR (Jim Goddard).	
10:30	11:00	0.50	381	3-6-1	Ran in the hole with 12-1/4" Bit.	
11:00	12:00	1.00	390	03-021	Drilled out float, shoe and drilled 12-1/4" hole from 380' to 390'.	
12:00	12:30	0.50	390	03-051	Circulated hole clean.	
12:30	13:00	0.50	390	3-46	Performed FiT	
13:00	13:30	0.50	390	3-6-2	Pulled out of the well bore.	
13:30	15:30	2.00	390	4-34-3	Made up Bit #3 with mud motor and tools.	
15:30	16:30	1.00	390	4-6-1	Ran in hole and installed rotating well head.	
16:30	22:30	6.00	2,226	3-2-2	Drilled 12-1/4" hole rotating and sliding from 390' to 2,226'	
22:30	23:00	0.50	2,226	03-051	Circulated well bore clean.	
23:00	0:00	1.00	2,500	3-2-2	Drilled 12-1/4" hole rotating and sliding from 2,226' to 2,500'.	

Management Summary

Installed BOPE, tested BOPE, Made up bit on slick assembly and cleaned out float collar, cement and shoe. Drilled 10' of new hole from 3,80' to 3,90'. Performed FIT. Tripped for PDC bit on mud motor and drilled 12-1/4" hole from 390' to 2,500'.

Comments

Slid from 1,487' to 1,514'
Slid from 1,860' to 1,890'

Clay has cleaned up and hit the top of the granite at around 3,240'.

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	

Mud Information

Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids %	Oil %	Water %	Sand %	LGS	Cl	Ca	CaCl	Gels 10s	Gels 10m	Gels 30m	Temp In	Temp Out	Mud Loss
09-Feb-21 21:45 at Depth 2,034 ft Mud Pits																				
8.80	44	15	16	7.2	1	10.5	8	0	92	2		1200			6	11	20	47	127	

Daily Drilling Report

Well ID: Forge 56-32
Field: Other

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 6 **Report For 09-Feb-21**

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Bicarb - OTHER	12	---	caustic - OTHER	2	---
Desco - OTHER	5	---	DMA/SPA - 100#SK	13	---
Drispac - OTHER	7	---	Gel - OTHER	80	---
PAllets/Wrap - OTHER	6	---	SAwdust - OTHER	2	---
walnut Pine - OTHER	40	---	xanthan gum - OTHER	2	---

Bit/BHA/Workstring Information

No	Run	Make	Model	Diam	Depth In	This Run Dist	This Run Hrs	R.O.P. Avg	R.O.P. Max	WOB	RPM	Torque	Mud Wt	Mud Flow	Pump Press	J. Vel	P. Drp	HHP	JIF
2	1	REED	M-22	12.250	380	9	1	9.0					9	800	2900	327	841	392	1191
Jets: 16 16 16 16					**Out:** 390		**Grade:**	**Cutter:**	1 / 1	**Dull:**	NO / NO		**Wear:** A		**Brgs:** 0	**Gge:** 1		**Pull:** TD	
3	1	REED	TKC66	12.250	390	2,110	7	301.4					9	800	2900	285	638	298	1037
Jets: 14 14 14 14 14 14					**Out:**		**Grade:**	**Cutter:**	/	**Dull:**	/		**Wear:**		**Brgs:**	**Gge:**		**Pull:**	

BHA - No. 3 - BIT, MMTR, XO, STAB, MONEL, SHOCK, 9 DC, XO, 24 HWDP = 1091.56

Drilling Parameters

Depth (ft) From	Depth (ft) To	ROP (ft/hr) Avg	ROP (ft/hr) Max	WOB (lbs) Avg	WOB (lbs) Max	RPM Avg	RPM Max	Torque (ft lbs) Avg	Torque (ft lbs) Max	Flow (gals/min) Avg	Flow (gals/min) Max	Pressure (psi)
390	2,500	450.0	950.0	25	40	60	80	2	8	800	800	3,150

Annular Velocity: **Drill Collars:** 203.0 **Drill Pipe:** 222.0

Miscellaneous Drilling Parameters

Hook Loads (lbs): **Off Bottom Rotate:** **Pick Up:** 140 **Slack Off:** 125 **Drag Avg/Max:** 10 / 12

Daily Drilling Report

Well ID: Forge 56-32
Field: Other

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 6 **Report For 09-Feb-21**

Survey Information

Survey Type	Meas. Depth	Inc.	Azimuth	TVD	Closure	Vertical Section	Coordinates N-S	Coordinates E-W	D.L.S.
MWD	401.0	0.70	31.4	401.0	1.9	1.3	N 1.3	E 1.4	0.275
MWD	493.0	0.70	352.1	493.0	2.9	2.4	N 2.4	E 1.6	0.511
MWD	585.0	1.14	358.3	585.0	4.1	3.9	N 3.9	E 1.5	0.489
MWD	767.0	1.36	355.0	767.0	5.5	5.5	N 5.5	W 0.3	1.992
MWD	858.0	1.54	7.2	857.9	7.8	7.8	N 7.8	W 0.2	0.392
MWD	949.0	1.41	6.3	948.9	10.1	10.1	N 10.1	E 0.1	0.145
MWD	1,040.0	1.54	10.5	1,039.9	12.4	12.4	N 12.4	E 0.4	0.184
MWD	1,135.0	1.71	5.6	1,134.8	15.1	15.1	N 15.1	E 0.8	0.230
MWD	1,230.0	1.85	13.5	1,229.8	18.0	18.0	N 18.0	E 1.3	0.295
MWD	1,325.0	1.85	16.9	1,324.7	21.1	21.0	N 21.0	E 2.1	0.117
MWD	1,419.0	2.02	16.7	1,418.7	24.2	24.0	N 24.0	E 3.0	0.181
MWD	1,514.0	1.36	30.5	1,513.6	26.9	26.6	N 26.6	E 4.1	0.811
MWD	1,608.0	1.54	37.5	1,607.6	29.0	28.5	N 28.5	E 5.4	0.269
MWD	1,703.0	1.71	43.6	1,702.6	31.4	30.6	N 30.6	E 7.1	0.254
MWD	1,798.0	1.98	49.1	1,797.5	34.0	32.7	N 32.7	E 9.4	0.340
MWD	1,892.0	1.36	55.8	1,891.5	36.2	34.4	N 34.4	E 11.5	0.690
MWD	1,986.0	1.27	71.7	1,985.5	37.8	35.3	N 35.3	E 13.4	0.398
MWD	2,081.0	1.45	63.0	2,080.4	39.4	36.2	N 36.2	E 15.5	0.288
MWD	2,175.0	1.23	72.4	2,174.4	41.0	37.0	N 37.0	E 17.5	0.330
MWD	2,270.0	1.49	60.7	2,269.4	42.7	37.9	N 37.9	E 19.6	0.399
MWD	2,365.0	1.36	74.3	2,364.3	44.5	38.9	N 38.9	E 21.7	0.379
MWD	2,458.0	1.32	71.2	2,457.3	46.1	39.5	N 39.5	E 23.8	0.088
MWD	2,551.0	1.67	73.7	2,550.3	48.0	40.2	N 40.2	E 26.1	0.383
MWD	2,648.0	2.02	78.9	2,647.2	50.3	40.9	N 40.9	E 29.2	0.401
MWD	2,743.0	2.02	85.3	2,742.2	52.6	41.4	N 41.4	E 32.5	0.235
MWD	2,839.0	1.54	70.3	2,838.1	54.9	42.0	N 42.0	E 35.4	0.691
MWD	2,934.0	1.27	61.7	2,933.1	57.0	42.9	N 42.9	E 37.5	0.360
MWD	3,029.0	1.80	66.0	3,028.1	59.3	44.0	N 44.0	E 39.8	0.571
MWD	3,124.0	0.97	100.4	3,123.0	61.1	44.5	N 44.5	E 41.9	1.199
MWD	3,219.0	0.70	92.6	3,218.0	62.0	44.3	N 44.3	E 43.3	0.308

Rig Information

Equipment Problems:
Location Condition:
Transport:

Solids Control Information

Screen Sizes:	Top	Bottom
Shaker No 1:	170	
Shaker No 2:	170	
Shaker No 3:	140	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5	112	19.5	S-135	4.5IF					

Safety Information

Meetings/Drills	Time	Description
Safety	60	Drilling

First Aid Treatments: **Medical Treatments:** **Lost Time Incidents:** **Days Since LTI:**

☐ **BOP Test** ☐ **Crownamatic Check**

Weather Information

Sky Condition:	Cloudy	**Visibility:**	10
Air Temperature:	34 degF	**Bar. Pressure:**	29.99
Wind Speed/Dir:	12 / S	**Wind Gusts:**	15

Daily Drilling Report

Well ID: Forge 56-32
Field: Other

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 7 **Report For 10-Feb-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**		**Daily Cost / Mud ($):**			---
Measured Depth (ft):	3404	**Last Casing:**	13.375 at 382	**Wellbore:**	Original Wellbore	**AFE No.**	**AFE ($)**		**Actual ($)**
Vertical Depth (ft):	3403	**Next Casing:**	9.625 at 3,500	**RKB Elevation (ft):**	30.40	---	---		---
Proposed TD (ft):	9000	**Last BOP Test:**		**Job Reference RKB (ft):**	28.50	---	---		---
Hole Made (ft) / Hrs:	904 / 12.0	**Next BOP Test:**		**Working Interest:**		**Totals:**	---		---
Average ROP (ft/hr):	75.33					**Well Cost ($):**			---
Drilling Days (act./plan):	3/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	3/38	**Days On Location:**			7
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 136	**Service:**	8 / 96	**Other:**	0 / 0	**Total:**	24 / 256

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Pulling out of the well bore to run 9-5/8" casing.

Planned Operations: Rig up and run 9-5/8" casing and cement in place.

Toolpusher: Justin Bristol, Steve Caldwell

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	1:00	1.00	2,698	3-2-2	Rotary Drilled 12-1/4" hole from 2,500' to 2,698'	
1:00	1:30	0.50	2,698	03-051	Circulated well bore clean.	
1:30	2:00	0.50	2,730	3-2-2	Slide drilled 12-1/4" hole from 2,698' to 2,730'.	
2:00	2:30	0.50	2,812	3-2-2	Rotary drilled 12-1/4" hole from 2,730' to 2,812'.	
2:30	3:00	0.50	2,852	3-2-2	Slide drilled 12-1/4" hole from 28,12' to 2,852'.	
3:00	4:00	1.00	3,082	3-2-2	Rotary drilled 12-1/4" hole from 2,852' to 3,082'.	
4:00	5:30	1.50	3,270	3-2-2	Rotary drilled 12-1/4" hole from 3,082' to 3,270'.	
5:30	6:30	1.00	3,270	03-051	Circulated and conditioned mud.	
6:30	11:30	5.00	3,270	3-27	Wiper trip to 380' with tight hole at 2,300'.	
11:30	13:30	2.00	3,308	3-2-2	Rotary drilled 12-1/4" hole from 3,270' to 3,308'.	
13:30	16:00	2.50	3,208	3-6-2	Pulled out of the well bore for new bit and motor.	
16:00	19:00	3.00	3,208	3-34-4	Laid down tools and picked up new bit with mud motor.	
19:00	20:00	1.00	3,208	3-6-1	Ran in the hole to 2,331'.	
20:00	22:30	2.50	3,305	3-3	Encountered tight spot and reamed 12-1/4" hole from 2,331' to 3,305'.	
22:30	0:00	1.50	3,404	3-2-2	Rotary drilled 12-1/4" hole from 3,305' to 3,404'.	

Management Summary

Drilled 12-1/4" hole from 2,500' to 3,270'. Wiped hole to 380' and reamed tight spot at 2,300'. Drilled 12-1/4" hole from 3,270' to 3,308' and pulled out of the well bore. Changed bit and motor. Ran in the hole and encountered bridge at 2,331'. Reamed 12-1/4" hole from 2,331' to 3,308'. Drilled 12-1/4" hole from 3,308' to 3,404'.

Comments

TD at 3500' is 100% Granodiorite,

After reaching TD at 3500' conducted a wiper trip to 2000' and the hole was clean.

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	

Mud Information

Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids %	Oil %	Water %	Sand %	LGS	Cl	Ca	CaCl	Gels 10s	Gels 10m	Gels 30m	Temp In	Temp Out	Mud Loss
10-Feb-21 23:30 at Depth 3,358 ft Mud Pits																				
8.80	44	19	17	6.8	1	10.5	8	0	92	2.5		1300	880		5	13	24	70	138	

Daily Drilling Report

Well ID: Forge 56-32
Field: Other

Geothermal Resource Group, Inc.

Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 7 **Report For 10-Feb-21**

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Barite - OTHER	10	---	caustic - OTHER	2	---
Desco CF - OTHER	2	---	DMA/SPA - 100#SK	9	---
Gel - OTHER	5	---	micro c - OTHER	64	---
PAllets/Wrap - OTHER	5	---	xanthan gum - OTHER	5	---

Bit/BHA/Workstring Information

No	Run	Make	Model	Diam	Depth In	This Run Dist	This Run Hrs	R.O.P. Avg	R.O.P. Max	WOB	RPM	Torque	Mud Wt	Pump Flow	Pump Press	J. Vel	P. Drp	HHP	JIF
3	1	REED	TKC66	12.250	390	808	5	161.6					9	800	2900	95	72	33	348
Jets: 22 22 22 22 22 22 22 11					**Out:** 3308		**Grade:**	**Cutter:**	8 / 1	**Dull:**	CR / CT		**Wear:** C		**Brgs:** 0		**Gge:** 1		**Pull:** PR
4	1	REED	TK63	12.250	3305	192	1.5	128.0					9	800	2900	106	89	42	388
Jets: 22 22 22 22 22 22 11 11					**Out:**		**Grade:**	**Cutter:**	/	**Dull:**	/		**Wear:**		**Brgs:**		**Gge:**		**Pull:**

BHA - No. 4 - = 1.20

Drilling Parameters

Depth (ft) From	Depth (ft) To	ROP (ft/hr) Avg	ROP (ft/hr) Max	WOB (lbs) Avg	WOB (lbs) Max	RPM Avg	RPM Max	Torque (ft lbs) Avg	Torque (ft lbs) Max	Flow (gals/min) Avg	Flow (gals/min) Max	Pressure (psi)
3,305	3,500	60.0	120.0	35	35	60	60	11	12	800	800	3,100

Annular Velocity: **Drill Collars:** 203.0 **Drill Pipe:** 222.0

Miscellaneous Drilling Parameters

Hook Loads (lbs): **Off Bottom Rotate:** 150 **Pick Up:** 160 **Slack Off:** 140 **Drag Avg/Max:** 10 / 15

Survey Information

Survey Type	Meas. Depth	Inc.	Azimuth	TVD	Closure	Vertical Section	Coordinates N-S	Coordinates E-W	D.L.S.
MWD	3,410.0	1.49	110.6	3,409.0	63.8	42.9	N 42.9	E 47.2	0.115
MWD	3,447.0	1.45	119.5	3,446.0	64.2	42.5	N 42.5	E 48.1	0.631

Mud Log Information

Depth (ft) From	Depth (ft) To	TVD (ft) From	TVD (ft) To	Gas (Units) Avg	Gas (Units) Max	Gas at Depth	Gas Connect.	Gas Trip	Drilling Exp.	Pore Press	Mud Dens.	Shale Dens.	ROP Shale	ROP Sand
2,470	3,050	2,470	3,050								8.80			
Formation Name:														
Lithology:	100% Alluvium													
3,050	3,180	3,050	3,180								8.80			
Formation Name:														
Lithology:	40-80% clay, 10-60% Alluvium, 0-40% granite, 0-10% diorite													
3,180	3,230	3,180	3,230								8.80			
Formation Name:														
Lithology:	50-80% granite, 20-50% clay													
3,230	3,270	3,230	3,270								8.80			
Formation Name:														
Lithology:	100% Granite													
3,270	3,340	3,270	3,340								8.80			
Formation Name:														
Lithology:	60-100% granodiorite, 0-40% Alluvium													
3,340	3,380	33,440	3,380								8.80			
Formation Name:	80-100% Diorite, 0-20% Granodior													
Lithology:														
3,390	3,400	3,390	3,400								8.80			
Formation Name:														
Lithology:	100% Granodiorite													

Daily Drilling Report

Well ID: Forge 56-32
Field: Other

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 7 **Report For 10-Feb-21**

Rig Information

Equipment Problems:	
Location Condition:	
Transport:	

Solids Control Information

Screen Sizes:	**Top**	**Bottom**
Shaker No 1:	170	
Shaker No 2:	170	
Shaker No 3:	140	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5	112	19.5	S-135	4.5IF					

Safety Information

Meetings/Drills	**Time**	**Description**
Safety	60	Tripping

First Aid Treatments:	**Medical Treatments:**	**Lost Time Incidents:**	**Days Since LTI:**

☐ **BOP Test** ☐ **Crownamatic Check**

Weather Information

Sky Condition:	Clear	**Visibility:**	10
Air Temperature:	28 degF	**Bar. Pressure:**	30.06
Wind Speed/Dir:	11 / S	**Wind Gusts:**	15

Daily Drilling Report

Well ID: Forge 56-32
Field: Other

Geothermal Resource Group

Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 8 **Report For 11-Feb-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**		**Daily Cost / Mud ($):**		---
Measured Depth (ft):	3500	**Last Casing:**	9.625 at 3,494	**Wellbore:**	Original Wellbore	**AFE No.**	**AFE ($)**	**Actual ($)**
Vertical Depth (ft):	3500	**Next Casing:**	5.500 at 9,000	**RKB Elevation (ft):**	30.40	---	---	---
Proposed TD (ft):	9000	**Last BOP Test:**		**Job Reference RKB (ft):**	28.50	---	---	---
Hole Made (ft) / Hrs:	96 / 5.0	**Next BOP Test:**		**Working Interest:**		**Totals:**	---	---
Average ROP (ft/hr):	19.2					**Well Cost ($):**		---
Drilling Days (act./plan):	4/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	4/38	**Days On Location:**		8
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 168	**Service:**	8 / 96	**Other:**	9 / 144	**Total:** 33 / 432

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Set slips for 9.625" casing in well head. Set in BOPE and tightening connections. Removing flow line to clean out cement.

Planned Operations: Test BOPE, Make up tools and clean out cement and shoe. Drill 10' of new hole and perform FIT. Drill 8.75" hole.

Toolpusher: Justin Bristol, Steve Caldwell

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	1:30	1.50	3,500	3-2-2	Drilled 12.25" hole from 3404' to 3500'.	
1:30	2:30	1.00	3,500	03-051	Circulated well bore clean.	
2:30	4:00	1.50	3,500	WIPE	Wiped hole from 3500' to 2000' and backed to bottom at 3500'.	
4:00	5:00	1.00	3,500	03-051	Circulated well bore clean.	
5:00	6:30	1.50	3,500	WIPE	Wiped hole from 3500' to 2000' and back to bottom at 3500'.	
6:30	7:30	1.00	3,500	03-051	Circulated well bore clean.	
7:30	11:00	3.50	3,500	3-6-2	Pulled out of the hole and laid down BHA.	
11:00	11:30	0.50	3,500	3-97	Cleared rig floor for casing run.	
11:30	12:00	0.50	3,500	SERV	Serviced Rig.	
12:00	14:00	2.00	3,500	WOE	Waited on Power Tongs. (Power tong truck had the rear end go out, waited on new truck).	
14:00	19:00	5.00	3,500	CASE	Rigged up and ran 83 joints of 9.625" 36 ppf, J-55, LT&C casing with shoe set at 3488'.	
19:00	21:30	2.50	3,500	03-051	Rigged down casers and circulated well bore clean.	
21:30	0:00	2.50	3,500	5-12-2	Rigged up Resource Cementing and filled lines with water and pressured tested to 2000 psi. Resource Cementing pumped 10 barrels of water ahead followed by 20 barrels of RC Mjud Clean Spacer followed by 30 barrels of 10.5 ppg Sepiolite Spacer followed by 5 barrels of fresh water spacer, followed by 13 barrels of sodium silicate followed by 5 barrels of fresh water spacer and pumped 300.8 barrels of 13.4 ppg RC ThermalLite HT cement. Dropped plug and displaced with 270 barrels of mud. Bumped plug with 1500 psi (500 psi over). Floats held. Had 35 barrels of cement to surface. CIP at 0000 hours.	

Management Summary

Drilled 12.25" hole from 3404' to 3500' and circulated well bore clean. Conducted 2 wiper trips to 2000' to wipe out swelling issue. Circulated well bore clean. Pulled out of the hole laying down 8" drill collars and directional tools. Rigged up and ran 83 joints of 9.625" 36 ppf, J-55 LT&C casing equipped with float shoe and insert baffle. Rigged up Resource Cementing and cemented casing in place. Had 35 barrels of cement to surface. CIP at 0000 hours.

Comments

Cement did not fall. Lifted BOPE and set slips.

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	
FULL	9.625	0	0	3,494	3,488	INT1	12.250	36	J-55	

Mud Information

Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids %	Oil %	Water %	Sand %	LGS %	Cl	Ca	CaCl	Gels 10s	Gels 10m	Gels 30m	Temp In	Temp Out	Mud Loss
11-Feb-21 07:00 at Depth 3,500 ft Mud Pits																				
8.80	46	19	18	7	1	10.5	8	0	92	2.25		1200	800		6	12	22	53	138	

Daily Drilling Report

Well ID: Forge 56-32
Field: Other

Geothermal Resource Group
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 8 **Report For 11-Feb-21**

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Barite - OTHER	60	---	Drispac - OTHER	1	---
micro c - OTHER	10	---	SAwdust - OTHER	2	---
walnut Pine - OTHER	3	---	xanthan gum - OTHER	2	---

Bit/BHA/Workstring Information

No	Run	Make	Model	Diam	Depth In	This Run Dist	This Run Hrs	R.O.P. Avg	R.O.P. Max	WOB	RPM	Torque	Mud Wt	Mud Flow	Pump Press	J. Vel	P. Drp	HHP	JIF
4	1	REED	TK63	12.250	3305	192	1.5												

Jets: 22 22 22 22 22 22 11 11 **Out:** **Grade:** **Cutter:** / **Dull:** / **Wear:** **Brgs:** **Gge:** **Pull:**

BHA - No. 4 - = 1.20

Rig Information

Equipment Problems:

Location Condition:

Transport:

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5	112	19.5	S-135	4.5IF					

Safety Information

Meetings/Drills	Time	Description
Safety	60	Running casing

First Aid Treatments: **Medical Treatments:** **Lost Time Incidents:** **Days Since LTI:**

☐ **BOP Test** ☐ **Crownamatic Check**

Weather Information

Sky Condition:	Cloudy	**Visibility:**	10
Air Temperature:	30 degF	**Bar. Pressure:**	29.79
Wind Speed/Dir:	17 / S	**Wind Gusts:**	20

Daily Drilling Report

Well ID: Forge 56-32
Field: Other

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 9 **Report For 12-Feb-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**		**Daily Cost / Mud ($):**			---
Measured Depth (ft):	3500	**Last Casing:**	9.625 at 3,494	**Wellbore:**	Original Wellbore	**AFE No.**	**AFE ($)**		**Actual ($)**
Vertical Depth (ft):	3500	**Next Casing:**	5.500 at 9,000	**RKB Elevation (ft):**	30.40	---	---		---
Proposed TD (ft):	9000	**Last BOP Test:**		**Job Reference RKB (ft):**	28.50	---	---		---
Hole Made (ft) / Hrs:	0 / 1.5	**Next BOP Test:**		**Working Interest:**		**Totals:**	---		---
Average ROP (ft/hr):	0.0					**Well Cost ($):**			---
Drilling Days (act./plan):	5/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	5/38	**Days On Location:**			9
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 168	**Service:**	8 / 96	**Other:**	2 / 24	**Total:**	26 / 312

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Continue to drill 8-3/4" hole with PDC bit at 3,768'

Planned Operations: Continue to drill 8-3/4" hole with PDC bit.

Toolpusher: Justin Bristol, Steve Caldwell

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	6:00	6.00	3,500	1-14	Break stack at well head. Lift stack, cleaned out cement from well head. Set slips in well head around 9-5/8" casing. Set down stack and nipped up. Cleaned BOPE stack of cement.	
6:00	9:00	3.00	3,500	1-15	Tested BOPE. Cleaned flow line of cement.	
9:00	9:30	0.50	3,500	11-343	Strapped drill collars, made up bit.	
9:30	10:30	1.00	3,500	11-6-1	Ran in the hole to 3,200'.	
10:30	13:00	2.50	3,500	3-28	Cleaned out cement stringers from 3,200' to 3,414' and drilled out baffle plate, cement and shoe at 3,488' and cement to 3,500'.	
13:00	14:30	1.50	3,500	03-021	Drilled 8.-3/4" hole from 3,500' to 3,506'.	
14:30	15:00	0.50	3,500	11-99	Performed sFIT with 8.8 ppg mud. Noticed pressure drop at 1,320 surface applied pressure. EMW 16 ppg (0.83 psi/ft frac grad)	
15:00	16:00	1.00	3,500	11-6-2	Pulled out of the hole.	
16:00	0:00	8.00	3,500	10-341	Picked up drill pipe single and stood back in derrick.	

Management Summary

Broke stack and well head and lifted stack. Cleaned out cement inside well head and set slips. Set stack back on well head and secured BOPE. Cleaned out cement in BOPE. Made up bit #5 and ran in the hole. Cleaned out baffle plate, cement and shoe. Drilled 6' of new hole from 3,500' to 3,506' and performed FIT. Pulled out of the hole and picked up drill pipe standing back in derrick.

Comments

Mud Cooler were turned on 2-10-2021.

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	
FULL	9.625	0	0	3,494	3,488	INT1	12.250	36	J-55	

Mud Information

Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids %	Oil %	Water %	Sand %	LGS	Cl	Ca	CaCl	Gels 10s	Gels 10m	Gels 30m	Temp In	Temp Out	Mud Loss
12-Feb-21 22:00 at Depth 3,506 ft Mud Pits																				
8.80	50	19	23	8	1	10.5	6	0	94	0.25		1300	880		7	15	26			

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Barite - OTHER	29	---	Bicarb - OTHER	15	---
Desco - OTHER	6	---	PAllets/Wrap - OTHER	2	---
SAwdust - OTHER	7	---			

Daily Drilling Report

Well ID: Forge 56-32
Field: Other

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 9 **Report For 12-Feb-21**

Bit/BHA/Workstring Information

No	Run	Make	Model	Diam	Depth In	This Run Dist	This Run Hrs	R.O.P. Avg	R.O.P. Max	WOB	RPM	Torque	Mud Wt	Mud Flow	Pump Press	J. Vel	P. Drp	HHP	JIF
5	1	HTC	GX 117	8.750	3500	6	1.5	4.0					9	800	2900	279	612	286	1016

Jets: 20 20 20 **Out:** 3506 **Grade:** **Cutter:** 3 / 3 **Dull** ER / **Wear:** A **Brgs:** 0 **Gge:** 1 **Pull:** TD

BHA - No. 6 - BIT, MMTR, OTHER, STAB, MONEL, SHOCK, 12 DC, 24 HWDP = 1178.12

Rig Information

Equipment Problems:
Location Condition:
Transport:

Solids Control Information

Screen Sizes:	Top	Bottom
Shaker No 1:	170	
Shaker No 2:	170	
Shaker No 3:	140	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5	277	19.5	S-135	4.5IF					

Safety Information

Meetings/Drills	Time	Description
Safety	60	Picking up drill and tools

First Aid Treatments: **Medical Treatments:** **Lost Time Incidents:** **Days Since LTI:**

☐ **BOP Test** ☐ **Crownamatic Check**

Weather Information

Sky Condition:	Cloudy	**Visibility:**	10
Air Temperature:	32 degF	**Bar. Pressure:**	29.88
Wind Speed/Dir:	7 / S	**Wind Gusts:**	10

Daily Drilling Report

Well ID: Forge 56-32
Field: UTAHFORGE

Geothermal Resource Group, Inc.

Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 10 **Report For 13-Feb-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**		**Daily Cost / Mud ($):**			---
Measured Depth (ft):	4385	**Last Casing:**	9.625 at 3,494	**Wellbore:**	Original Wellbore	**AFE No.**	**AFE ($)**		**Actual ($)**
Vertical Depth (ft):	4383	**Next Casing:**	5.500 at 9,000	**RKB Elevation (ft):**	30.40	---	---		---
Proposed TD (ft):	9000	**Last BOP Test:**	12-Feb-21	**Job Reference RKB (ft):**	28.50	---	---		---
Hole Made (ft) / Hrs:	885 / 19.0	**Next BOP Test:**		**Working Interest:**		**Totals:**	---		---
Average ROP (ft/hr):	46.58			**LOT (lbs/gal):**	16.00	**Well Cost ($):**			---
Drilling Days (act./plan):	6/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	6/38	**Days On Location:**			10
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 168	**Service:**	8 / 96	**Other:**	0 / 0	**Total:**	24 / 288

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Drilling 8-3/4" hole at 4,480'.

Planned Operations: Continue drilling 8-3/4" hole with Bit # 6 and Trip for Bit #7 and drill 8-3/4" hole.

Toolpusher: Justin Bristol, Steve Caldwell

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	0:30	0.50	3,506	SERV	Serviced Rig.	
0:30	2:30	2.00	3,506	7-34-3	Strapped collars and made up tools.	
2:30	4:30	2.00	3,506	7-6-1	Ran in the hole.	
4:30	5:00	0.50	3,579	DRILR	Rotary drilled 8-3/4" hole from 3,506' to 3,579'.	
5:00	5:30	0.50	3,599	3-2-3	Slide drilled 8-3/4" hole from 3,579' to 3,599'.	
5:30	9:30	4.00	3,938	3-2-2	Rotary drilled 8-3/4" hole from 3,599' to 3,938'.	
9:30	10:00	0.50	3,950	3-2-3	Slide drilled 8-3/4" hole from 3,938' to 3,950'.	
10:00	11:30	1.50	4,033	3-2-2	Rotary drilled 8-3/4" hole from 3,950' to 4,033'.	
11:30	12:00	0.50	4,060	3-2-3	Slide drilled 8-3/4" hole from 4,033' to 4,060'.	
12:00	15:30	3.50	4,214	3-2-2	Rotary drilled 8-3/4" hole from 4,060' to 4,214'.	
15:30	16:00	0.50	4,214	SERV	Serviced Rig.	
16:00	0:00	8.00	4,385	3-2-2	Rotary drilled 8-3/4" hole from 4,214' to 4,385'.	

Management Summary

Made up Bit #6 and tools. Ran in the well bore and rotated and slid drilled 8-3/4" hole from 3,506' to 4,385'.

Comments

Drilling in 0-100% Granodiorite, 0-100% Felsic Dike, rare amounts of epidote and iron pirite

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	16.30
FULL	9.625	0	0	3,494	3,488	INT1	12.250	36	J-55	16.00

Mud Information

Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids %	Oil %	Water %	Sand %	LGS	Cl	Ca	CaCl	Gels 10s	Gels 10m	Gels 30m	Temp In	Temp Out	Mud Loss
13-Feb-21 19:00 at Depth 4,287 ft Mud Pits																				
8.80	49	19	25	7.8	1	11	7	0	93	1		1200	720		5	10	16	75	124	

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
caustic - OTHER	1	---	Defoamer - OTHER	7	---
Desco - OTHER	4	---	DMA/SPA - 100#SK	6	---
Drispac - OTHER	3	---	Gel - OTHER	10	---
micro c - OTHER	20	---	PAllets/Wrap - OTHER	2	---
SAwdust - OTHER	4	---	walnut Pine - OTHER	14	---
xanthan gum - OTHER	2	---			

Daily Drilling Report

Well ID: Forge 56-32
Field: UTAHFORGE

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 10 **Report For 13-Feb-21**

Bit/BHA/Workstring Information

No	Run	Make	Model	Diam	Depth In	This Run Dist	This Run Hrs	R.O.P. Avg	R.O.P. Max	WOB	RPM	Torque	Mud Wt	Pump Flow	Pump Press	J. Vel	P. Drp	HHP	JIF
6	1	REED	TKC73-H	8.750	3506	885	19	46.6	140.0	35	220		9	750	3500	243	465	203	830

Jets: 13 13 13 14 14 14 14 **Out:** **Grade:** **Cutter:** / **Dull:** / **Wear:** **Brgs:** **Gge:** **Pull:**

BHA - No. 6 - BIT, MMTR, OTHER, STAB, MONEL, SHOCK, 12 DC, 24 HWDP = 1178.12

Drilling Parameters

Depth (ft) From	Depth (ft) To	ROP (ft/hr) Avg	ROP (ft/hr) Max	WOB (lbs) Avg	WOB (lbs) Max	RPM Avg	RPM Max	Torque (ft lbs) Avg	Torque (ft lbs) Max	Flow (gals/min) Avg	Flow (gals/min) Max	Pressure (psi)
3,700	4,430	20.0		38		60	100	6		650		2,700

Annular Velocity: **Drill Collars:** 310.0 **Drill Pipe:** 382.0

Miscellaneous Drilling Parameters

Hook Loads (lbs): **Off Bottom Rotate:** 160 **Pick Up:** 170 **Slack Off:** 145 **Drag Avg/Max:** 10 / 12

Slow Circulation Data:

Pump 1:	20 spm	170 psi	40 spm	290 psi	60 spm	490 psi
Pump 2:	20 spm	160 psi	40 spm	300 psi	60 spm	520 psi

Survey Information

Survey Type	Meas. Depth	Inc.	Azimuth	TVD	Closure	Vertical Section	Coordinates N-S	Coordinates E-W	D.L.S.
MWD	3,497.0	1.45	119.7	3,496.0	64.6	41.9	N 41.9	E 49.2	0.009
MWD	3,592.0	0.09	235.7	3,590.9	64.9	41.2	N 41.2	E 50.2	1.570
MWD	3,687.0	1.19	275.8	3,685.9	64.2	41.3	N 41.3	E 49.1	1.182
MWD	3,792.0	1.14	257.4	3,790.9	62.5	41.2	N 41.2	E 47.0	0.359
MWD	3,877.0	1.71	259.0	3,875.9	60.7	40.8	N 40.8	E 44.9	0.672
MWD	3,972.0	2.37	239.7	3,970.8	57.5	39.5	N 39.5	E 41.9	0.995
MWD	4,067.0	0.88	14.5	4,065.8	56.3	39.2	N 39.2	E 40.3	3.216
MWD	4,163.0	0.70	68.7	4,161.8	57.4	40.1	N 40.1	E 41.1	0.767
MWD	4,258.0	1.14	248.5	4,256.8	57.1	40.0	N 40.0	E 40.7	1.937
MWD	4,353.0	1.89	253.3	4,351.8	54.8	39.2	N 39.2	E 38.4	0.800

Mud Log Information

Depth (ft) From	Depth (ft) To	TVD (ft) From	TVD (ft) To	Gas (Units) Avg	Gas (Units) Max	Gas at Depth	Gas Connect.	Gas Trip	Drilling Exp.	Pore Press	Mud Dens.	Shale Dens.	ROP Shale	ROP Sand
3,700	3,800													

Formation Name:
Lithology: 40-80% Granodiorite, 0-60% Diorite, 0-20% Granite

3,800	3,900

Formation Name:
Lithology: 60-70% Diorite, 30-40% Granodiorite

3,900	4,000

Formation Name:
Lithology: 30-100% Granodorite, 0-70% Diorite, 0-60% Granite

4,000	4,100

Formation Name:
Lithology: 100% Granodiorite

4,100	4,380

Formation Name:
Lithology: 0-100% Granodiorite, 0-100%; Felsic Dike

Rig Information

Equipment Problems: Number 3 generator down, mechanic called.
Location Condition:
Transport:

Daily Drilling Report

Well ID: Forge 56-32
Field: UTAHFORGE

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 10 **Report For 13-Feb-21**

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5	277	19.5	S-135	4.5IF					

Safety Information

Meetings/Drills	Time	Description
Safety	60	Drilling connections

First Aid Treatments:	Medical Treatments:	Lost Time Incidents:	Days Since LTI:

☐ BOP Test ☐ Crownamatic Check

Weather Information

Sky Condition:	Snow	**Visibility:**	1
Air Temperature:	27 degF	**Bar. Pressure:**	29.63
Wind Speed/Dir:	13 / NNW	**Wind Gusts:**	20

Daily Drilling Report

Well ID: Forge 56-32
Field: UTAHFORGE

Geothermal Resource Group, Inc.

Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 11 **Report For 14-Feb-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**		**Daily Cost / Mud ($):**			---
Measured Depth (ft):	4702	**Last Casing:**	9.625 at 3,494	**Wellbore:**	Original Wellbore	**AFE No.**	**AFE ($)**		**Actual ($)**
Vertical Depth (ft):	4700	**Next Casing:**	5.500 at 9,000	**RKB Elevation (ft):**	30.40	---	---		---
Proposed TD (ft):	9000	**Last BOP Test:**	12-Feb-21	**Job Reference RKB (ft):**	28.50	---	---		---
Hole Made (ft) / Hrs:	317 / 21.0	**Next BOP Test:**		**Working Interest:**		**Totals:**	---		---
Average ROP (ft/hr):	15.1			**LOT (lbs/gal):**	16.00	**Well Cost ($):**			---
Drilling Days (act./plan):	7/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	7/38	**Days On Location:**			11
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 168	**Service:**	8 / 96	**Other:**	0 / 0	**Total:**	24 / 288

Safety Summary: No incidents or events reported. Conducted Crown Check, Safety Meeting.

Current Operations: Drilling 8-3/4" hole at 4,832' with tricone bit

Planned Operations: Drill 8-3/4" hole with tricone bit. When bit wears off, change to continue drilling with PDC bit.

Toolpusher: Justin Bristol, Steve Caldwell

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	1:00	1.00	4,405	3-2-2	Rotary drilled 8-3/4" hole from 4,385' to 4,405'.	
1:00	3:00	2.00	4,420	3-2-3	Slide drilled 8-3/4" hole from 4,405' to 4,420'.	
3:00	12:30	9.50	4,595	3-2-2	Rotary drilled 8-3/4" hole from 4,420' to 4,595'.	
12:30	16:30	4.00	4,595	3-6-4	Pulled out of the hole laying down bit and tools.	
16:30	19:00	2.50	4,595	3-34-3	Made up bit, directional tools and ran in the hole.	
19:00	19:30	0.50	4,595	3-5-1	Filled pipe and circulated.	
19:30	20:30	1.00	4,620	3-2-3	Slide drilled 8-3/4" hole from 4,595' to 4,620'.	
20:30	23:30	3.00	4,692	3-2-2	Rotary drilled 8-3/4" hole from 4,620' to 4,692'.	
23:30	0:00	0.50	4,702	3-2-3	Slide drilled 8-3/4" hole from 4,692' to 4,702'.	

Management Summary

Drilled 8-3/4" hole from 4,385' to 4,598' and tripped for Bit #7 (tricone) and new shock sub. Drilled 8-3/4" hole from 4,598' to 4,702'.

Comments

Drilling break at 4,774' 80% Granodiorite and 20% altered.

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	16.30
FULL	9.625	0	0	3,494	3,488	INT1	12.250	36	J-55	16.00

Mud Information

Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids %	Oil %	Water %	Sand %	LGS	Cl	Ca	CaCl	Gels 10s	Gels 10m	Gels 30m	Temp In	Temp Out	Mud Loss
14-Feb-21 21:00 at Depth 4,630 ft Mud Pits																				
8.70	46	15	24	8.2	1	10.5	6	0	94	1		1200	720		5	9	16	77	138	

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Barite - OTHER	20	---	caustic - OTHER	2	---
Defoamer - OTHER	4	---	Desco - OTHER	1	---
Drispac - OTHER	6	---	Gel - OTHER	20	---
micro c - OTHER	10	---	walnut Pine - OTHER		---
xanthan gum - OTHER	1	---			

Daily Drilling Report

Well ID: Forge 56-32
Field: UTAHFORGE

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 11 **Report For 14-Feb-21**

Bit/BHA/Workstring Information

No	Run	Make	Model	Diam	Depth In	This Run Dist	This Run Hrs	R.O.P. Avg	R.O.P. Max	WOB	RPM	Torque	Mud Wt	Pump Flow	Pump Press	J. Vel	P. Drp	HHP	JIF
6	1	REED	TKC73-H	8.750	3506	1,095	31.5	34.8					9	660	2300	214	360	139	643
Jets: 13 13 13 14 14 14 14					Out: 4595		Grade:	Cutter:	1 / 2	Dull:	CT / CT		Wear: S		Brgs: X		Gge: 1		Pull: OTH
7	1	HTC	EP5475	8.750	4596	107	4.5	23.8					9	660	2300	230	417	160	692
Jets: 20 20 20					Out:		Grade:	Cutter:	/	Dull:	/		Wear:		Brgs:		Gge:		Pull:

BHA - No. 7 - BIT, MMTR, XO, STAB, MONEL, SH/SUB, 12 DC, 24 HWDP = 1178.54

Drilling Parameters

Depth (ft) From	Depth (ft) To	ROP (ft/hr) Avg	ROP (ft/hr) Max	WOB (lbs) Avg	WOB (lbs) Max	RPM Avg	RPM Max	Torque (ft lbs) Avg	Torque (ft lbs) Max	Flow (gals/min) Avg	Flow (gals/min) Max	Pressure (psi)
4,595	4,620	21.0	25.0	45	48	0	0			670		
Comments: SLIDING												
4,620	4,692	21.0	31.0	45	48	57	60			671		
Comments: ROTARY												
4,692	4,715	19.0	53.0	45	48	0	0			670		
Comments: SLIDING												

Miscellaneous Drilling Parameters

Hook Loads (lbs): **Off Bottom Rotate:** 160 **Pick Up:** 170 **Slack Off:** 150 **Drag Avg/Max:** 10 / 10

Slow Circulation Data:

Pump 1:	20 spm	170 psi	40 spm	290 psi	60 spm	490 psi
Pump 2:	20 spm	160 psi	40 spm	300 psi	60 spm	520 psi

Survey Information

Survey Type	Meas. Depth	Inc.	Azimuth	TVD	Closure	Vertical Section	Coordinates N-S	Coordinates E-W	D.L.S.
MWD	4,448.0	1.19	338.6	4,446.7	53.9	39.7	N 39.7	E 36.5	2.261
MWD	4,544.0	3.34	311.0	4,542.7	54.4	42.4	N 42.4	E 34.0	2.449
MWD	4,640.0	2.02	246.1	4,638.6	53.1	43.6	N 43.6	E 30.4	3.211

Mud Log Information

Depth (ft) From	Depth (ft) To	TVD (ft) From	TVD (ft) To	Gas (Units) Avg	Gas (Units) Max	Gas at Depth	Gas Connect.	Gas Trip	Drilling Exp.	Pore Press	Mud Dens.	Shale Dens.	ROP Shale	ROP Sand
4,380	4,700	4,376	4,696											

Formation Name:

Lithology: 100% Granodiorite

Rig Information

Equipment Problems:

Location Condition:

Transport:

Solids Control Information

Screen Sizes:	Top	Bottom
Shaker No 1:	170	
Shaker No 2:	170	
Shaker No 3:	140	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5	277	19.5	S-135	4.5IF					

Safety Information

Meetings/Drills	Time	Description
Safety	60	Making connections

First Aid Treatments: **Medical Treatments:** **Lost Time Incidents:** **Days Since LTI:**

☐ **BOP Test** ☑ **Crownamatic Check**

Weather Information

Sky Condition:	Cloudy	**Visibility:**	10
Air Temperature:	21 degF	**Bar. Pressure:**	30.06
Wind Speed/Dir:	6 / ENE	**Wind Gusts:**	10

Daily Drilling Report

Well ID: Forge 56-32
Field: UTAHFORGE

Geothermal Resource Group, Inc.

Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 12 **Report For 15-Feb-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**		**Daily Cost / Mud ($):**			---
Measured Depth (ft):	5143	**Last Casing:**	9.625 at 3,494	**Wellbore:**	Original Wellbore	**AFE No.**	**AFE ($)**		**Actual ($)**
Vertical Depth (ft):	5141	**Next Casing:**	5.500 at 9,000	**RKB Elevation (ft):**	30.40	---	---		---
Proposed TD (ft):	9000	**Last BOP Test:**	12-Feb-21	**Job Reference RKB (ft):**	28.50	---	---		---
Hole Made (ft) / Hrs:	441 / 22.75	**Next BOP Test:**		**Working Interest:**		**Totals:**	---		---
Average ROP (ft/hr):	19.38			**LOT (lbs/gal):**	16.00	**Well Cost ($):**			---
Drilling Days (act./plan):	8/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	8/38	**Days On Location:**			12
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 168	**Service:**	8 / 96	**Other:**	0 / 0	**Total:**	24 / 288

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Making up new 8-3/4" PDC bit and mud motor.

Planned Operations: Drill 8-3/4" hole with PDC bit.

Toolpusher: Justin Bristol, Steve Caldwell

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	1:00	1.00	4,715	3-2-3	Slide drilled 8.-3/4" hole from 4,702' to 4,715'.	
1:00	11:30	10.50	4,932	3-2-2	Rotary drilled 8.-3/4" hole from 4,715' to 4,932'.	
11:30	12:00	0.50	4,932	SERV	Serviced Rig.	
12:00	23:15	11.25	5,143	3-2-2	Rotary drilled 8-3/4" hole from 4,932' to 5,143'.	
23:15	0:00	0.75	5,143	3-5-1	Circulated bottoms up in preparation for trip out of hole.	

Management Summary

Drilled 8-3/4" hole from 4,702' to 5,143' and circulated bottoms up for trip out of hole due to pressure spike. NOTE: Bit was locked up and ground flat on two cones. Motor also failed.

Comments

Drilling in Granodiorte.

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	16.30
FULL	9.625	0	0	3,494	3,488	INT1	12.250	36	J-55	16.00

Mud Information

Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids %	Oil %	Water %	Sand %	LGS	Cl	Ca	CaCl	Gels 10s	Gels 10m	Gels 30m	Temp In	Temp Out	Mud Loss
15-Feb-21 22:00 at Depth 5,113 ft Mud Pits																				
8.60	44	11	21	8.8	1	10.5	5	0	95	1		1200	960		4	8	15	124	130	

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Barite - OTHER	10	---	caustic - OTHER	1	---
Defoamer - OTHER	2	---	DMA/SPA - 100#SK	2	---
Drispac - OTHER	1	---	Gel - OTHER	10	---
micro c - OTHER	10	---	SAwdust - OTHER	2	---
walnut Pine - OTHER	10	---	xanthan gum - OTHER	1	---

Bit/BHA/Workstring Information

No	Run	Make	Model	Diam	Depth In	This Run Dist	This Run Hrs	R.O.P. Avg	R.O.P. Max	WOB	RPM	Torque	Mud Wt	Pump Flow	Pump Press	J. Vel	P. Drp	HHP	JIF
7	1	HTC	EP5475	8.750	4596	535	27.25	19.6	118.9	40	50	7	9	670	2700	234	425	166	705

Jets: 20 20 20 **Out:** 5143 **Grade:** **Cutter:** 8 / 8 **Dull:** FC / BT **Wear:** A **Brgs:** 8 **Gge:** 0.25 **Pull:** PP

BHA - No. 7 - BIT, MMTR, XO, STAB, MONEL, SH/SUB, 12 DC, 24 HWDP = 1178.54

Daily Drilling Report

Well ID: Forge 56-32
Field: UTAHFORGE

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 12 **Report For 15-Feb-21**

Drilling Parameters

Depth (ft) From	Depth (ft) To	ROP (ft/hr) Avg	ROP (ft/hr) Max	WOB (lbs) Avg	WOB (lbs) Max	RPM Avg	RPM Max	Torque (ft lbs) Avg	Torque (ft lbs) Max	Flow (gals/min) Avg	Flow (gals/min) Max	Pressure (psi)
4,702	4,832	18.0	22.0	35	45	50	55	7	8	740	768	2,700
Annular Velocity:	**Drill Collars:**	538.0	**Drill Pipe:**	340.0								
Comments:	Rotating											
4,832	4,932	20.0	23.0	43	45	40	50	7	8	740	768	27,500
Annular Velocity:	**Drill Collars:**	538.0	**Drill Pipe:**	340.0								
Comments:	Rotating											

Miscellaneous Drilling Parameters

Hook Loads (lbs):	**Off Bottom Rotate:**	160	**Pick Up:**	170	**Slack Off:**	150	**Drag Avg/Max:**	10 / 15	
Slow Circulation Data:									
Pump 1:	20 spm	170 psi	40 spm	290 psi	60 spm	490 psi			
Pump 2:	20 spm	160 psi	40 spm	300 psi	60 spm	520 psi			

Survey Information

Survey Type	Meas. Depth	Inc.	Azimuth	TVD	Closure	Vertical Section	Coordinates N-S	Coordinates E-W	D.L.S.
MWD	4,734.0	1.27	30.9	4,732.6	52.7	43.8	N 43.8	E 29.4	3.344
MWD	4,829.0	0.70	7.3	4,827.5	54.3	45.3	N 45.3	E 30.0	0.724
MWD	4,924.0	0.84	3.6	4,922.5	55.4	46.6	N 46.6	E 30.1	0.156
MWD	5,018.0	0.75	295.9	5,016.5	56.0	47.5	N 47.5	E 29.6	0.945

Mud Log Information

Depth (ft) From	Depth (ft) To	TVD (ft) From	TVD (ft) To	Gas (Units) Avg	Gas (Units) Max	Gas at Depth	Gas Connect.	Gas Trip	Drilling Exp.	Pore Press	Mud Dens.	Shale Dens.	ROP Shale	ROP Sand
4,760	4,870	4,758	4,868											
Formation Name:														
Lithology:	80% Granodiorite, 20% altered zone (increase in Hematite * chlorite wash, infreq epidote)													
4,870	5,140	4,868	5,138											
Formation Name:														
Lithology:	100% Granodiorite													

Rig Information

Equipment Problems:
Location Condition:
Transport:

Solids Control Information

Screen Sizes:	Top	Bottom
Shaker No 1:	170	
Shaker No 2:	170	
Shaker No 3:	140	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5	277	19.5	S-135	4.5IF					

Safety Information

Meetings/Drills	Time	Description
Safety	60	Connections and pinch points

First Aid Treatments: **Medical Treatments:** **Lost Time Incidents:** **Days Since LTI:**

☐ **BOP Test** ☐ **Crownamatic Check**

Weather Information

Sky Condition:	Cloudy	**Visibility:**	8
Air Temperature:	27 degF	**Bar. Pressure:**	29.82
Wind Speed/Dir:	9 / SSW	**Wind Gusts:**	12

Daily Drilling Report

Well ID: Forge 56-32
Field: UTAHFORGE

Geothermal Resource Group, Inc.

Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 13 **Report For 16-Feb-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**		**Daily Cost / Mud ($):**			---
Measured Depth (ft):	5610	**Last Casing:**	9.625 at 3,494	**Wellbore:**	Original Wellbore	**AFE No.**	**AFE ($)**		**Actual ($)**
Vertical Depth (ft):	5608	**Next Casing:**	5.500 at 9,000	**RKB Elevation (ft):**	30.40	---	---		---
Proposed TD (ft):	9000	**Last BOP Test:**	12-Feb-21	**Job Reference RKB (ft):**	28.50	---	---		---
Hole Made (ft) / Hrs:	467 / 23.5	**Next BOP Test:**		**Working Interest:**		**Totals:**	---		---
Average ROP (ft/hr):	19.87			**LOT (lbs/gal):**	16.00	**Well Cost ($):**			---
Drilling Days (act./plan):	9/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	9/38	**Days On Location:**			13
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 168	**Service:**	8 / 96	**Other:**	0 / 0	**Total:**	24 / 288

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Changing out BHA and running in the hole with new 8-3/4" PDC

Planned Operations: Finish running in the hole with BHA #9. Continue drilling 8-3/4" hole to 7,500'.

Toolpusher: Justin Bristol, Steve Caldwell

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	5:00	5.00	5,143	3-6-2	Pulled out of the hole and laid down bit and mud motor.	
5:00	7:30	2.50	5,143	3-6-1	Made up new bit and mud motor, ran in the hole to 5,083'.	
7:30	8:00	0.50	5,143	3-53	Filled pipe and washed to bottom at 5,143'.	
8:00	8:30	0.50	5,174	3-2-2	Rotary drilled 8-3/4" hole from 5,143' to 5,174'.	
8:30	9:00	0.50	5,189	3-2-3	Slide drilled 8-3/4" hole from 5,174' to 5,189'.	
9:00	14:30	5.50	5,363	3-2-2	Rotary drilled 8-3/4" hole from 5,189' to 5,363'.	
14:30	15:30	1.00	5,375	3-2-3	Slide drilled 8-3/4" hole from 5,363' to 5,375'.	
15:30	22:00	6.50	5,543	3-2-2	Rotary drilled 8-3/4" hole from 5,375' 5,543'.	
22:00	22:30	0.50	5,558	3-2-3	Slide drilled 8-3/4" hole from 5,543' to 5,558'.	
22:30	0:00	1.50	5,610	3-2-2	Rotary drilled 8-3/4" hole from 5,558' to 5,610'.	

Management Summary

Tripped for Bit and BHA#8. Rotated and slid drilled 8.75" hole from 4310' to 5610'.

Comments

Bit number 8 looks good. MWD failed and bearing in motor are worn out. Top stabilizer starting to come apart.
Drilling in 100% Granodioite.

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	16.30
FULL	9.625	0	0	3,494	3,488	INT1	12.250	36	J-55	16.00

Mud Information

Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids %	Oil %	Water %	Sand %	LGS %	Cl	Ca	CaCl	Gels 10s	Gels 10m	Gels 30m	Temp In	Temp Out	Mud Loss
16-Feb-21 22:00 at Depth 5,544 ft Mud Pits																				
8.70	44	12	16	9.8	1	10.5	6	0	94	1.25		1200	960		5	8	17	118	125	

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Barite - OTHER	21	---	caustic - OTHER	4	---
Defoamer - OTHER	3	---	Drispac - OTHER	3	---
Gel - OTHER	20	---	lime - OTHER	3	---
micro c - OTHER	10	---	PAllets/Wrap - OTHER	4	---
soda ash - OTHER	1	---	walnut Pine - OTHER	24	---

Daily Drilling Report

Well ID: Forge 56-32
Field: UTAHFORGE

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 13 **Report For 16-Feb-21**

Bit/BHA/Workstring Information

No	Run	Make	Model	Diam	Depth In	This Run Dist	This Run Hrs	R.O.P. Avg	R.O.P. Max	WOB	RPM	Torque	Mud Wt	Mud Flow	Pump Press	J. Vel	P. Drp	HHP	JIF
7	1	HTC	EP5475	8.750	4596	467	15.42	30.3	61.0	40	40	7	8	700	2800	244	416	170	690
Jets: 20 20 20					**Out:** 5143		**Grade:**	**Cutter:**	8 / 8	**Dull:**	FC / BT	**Wear:** A	**Brgs:** 8	**Gge:**	0.25	**Pull:** PP			
8	1	REED	TKC63	8.750	5143														
Jets: 14 14 14 14 14 14					**Out:** 5610		**Grade:**	**Cutter:**	1 / 1	**Dull:**	NO / NO	**Wear:** A	**Brgs:** X	**Gge:**	1	**Pull:** DTF			

BHA - No. 8 - BIT, MMTR, OTHER, STAB, MONEL, SHOCK, DC, HWDP = 1178.50

Drilling Parameters

Depth (ft) From	Depth (ft) To	ROP (ft/hr) Avg	ROP (ft/hr) Max	WOB (lbs) Avg	WOB (lbs) Max	RPM Avg	RPM Max	Torque (ft lbs) Avg	Torque (ft lbs) Max	Flow (gals/min) Avg	Flow (gals/min) Max	Pressure (psi)
4,143	5,174	30.0	41.0	40	45	40	45	6	7	700	700	2,750
Annular Velocity:	**Drill Collars:**	538.0	**Drill Pipe:**	340.0								
5,174	5,189	20.0	25.0	45	45	0	0			700	701	2,750
Annular Velocity:	**Drill Collars:**	538.0	**Drill Pipe:**	340.0								
5,189	5,363	30.0	31.0	45	45	40	50	6	7	700	700	2,750
Annular Velocity:	**Drill Collars:**	538.0	**Drill Pipe:**	340.0								
5,363	5,375	20.0	21.0	40	44	0	0			700	700	2,780
Annular Velocity:	**Drill Collars:**	538.0	**Drill Pipe:**	340.0								
5,375	5,545	30.0	41.0	40	45	40	45	7	8	700	700	2,800
Annular Velocity:	**Drill Collars:**	538.0	**Drill Pipe:**	340.0								
5,545	5,558	20.0	20.0	40	45	0	0	0	0	700	700	2,800
Annular Velocity:	**Drill Collars:**	538.0	**Drill Pipe:**	340.0								
5,558	5,610	33.0	41.0	40	40	40	40	8	8	700	700	2,800
Annular Velocity:	**Drill Collars:**	538.0	**Drill Pipe:**	340.0								

Comments: Pull out of the well bore due to MWD

Miscellaneous Drilling Parameters

Hook Loads (lbs): **Off Bottom Rotate:** 160 **Pick Up:** 170 **Slack Off:** 150 **Drag Avg/Max:** 10 / 12

Slow Circulation Data:

Pump 1:	20 spm	170 psi	40 spm	290 psi	60 spm	490 psi
Pump 2:	20 spm	160 psi	40 spm	300 psi	60 spm	520 psi

Survey Information

Survey Type	Meas. Depth	Inc.	Azimuth	TVD	Closure	Vertical Section	Coordinates N-S	Coordinates E-W	D.L.S.
MWD	5,113.0	1.85	211.0	5,111.5	54.4	46.5	N 46.5	E 28.2	2.035
MWD	5,208.0	2.42	23.9	5,206.5	54.8	47.0	N 47.0	E 28.3	4.486
MWD	5,302.0	2.68	273.6	5,300.4	55.8	48.9	N 48.9	E 26.9	4.455
MWD	5,397.0	1.01	17.6	5,395.4	55.8	49.9	N 49.9	E 24.9	3.246

Mud Log Information

Depth (ft) From	Depth (ft) To	TVD (ft) From	TVD (ft) To	Gas (Units) Avg	Gas (Units) Max	Gas at Depth	Gas Connect.	Gas Trip	Drilling Exp.	Pore Press	Mud Dens.	Shale Dens.	ROP Shale	ROP Sand
5,140	5,370	5,138	5,368								8.70			
Formation Name:														
Lithology:	100% Granodiorite (frequent fluctuations in amount of biotite)													
5,370	5,600	5,368	5,598								8.70			
Formation Name:														
Lithology:	100% Granodiorite (Less overall secondary minerals)													

Rig Information

Equipment Problems:

Location Condition:

Transport:

Daily Drilling Report

Well ID: Forge 56-32
Field: UTAHFORGE

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 13 **Report For 16-Feb-21**

Solids Control Information

Screen Sizes:	Top	Bottom
Shaker No 1:	170	
Shaker No 2:	170	
Shaker No 3:	140	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5	277	19.5	S-135	4.5IF					

Safety Information

Meetings/Drills	Time	Description
Safety	60	Making connections from derrick.

First Aid Treatments:	Medical Treatments:	Lost Time Incidents:	Days Since LTI:

☐ BOP Test ☐ Crownamatic Check

Weather Information

Sky Condition:	Cloudy	Visibility:	8
Air Temperature:	21 degF	Bar. Pressure:	29.95
Wind Speed/Dir:	8 / N	Wind Gusts:	10

Daily Drilling Report

Well ID: Forge 56-32
Field: UTAHFORGE

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 14 **Report For 17-Feb-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**		**Daily Cost / Mud ($):**			---
Measured Depth (ft):	5978	**Last Casing:**	9.625 at 3,494	**Wellbore:**	Original Wellbore	**AFE No.**	**AFE ($)**		**Actual ($)**
Vertical Depth (ft):	5976	**Next Casing:**	5.500 at 9,000	**RKB Elevation (ft):**	30.40	---	---		---
Proposed TD (ft):	9000	**Last BOP Test:**	12-Feb-21	**Job Reference RKB (ft):**	28.50	---	---		---
Hole Made (ft) / Hrs:	368 / 19.0	**Next BOP Test:**		**Working Interest:**		**Totals:**	---		---
Average ROP (ft/hr):	19.37			**LOT (lbs/gal):**	16.00	**Well Cost ($):**			---
Drilling Days (act./plan):	10/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	10/38	**Days On Location:**			14
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 168	**Service:**	8 / 96	**Other:**	0 / 0	**Total:**	24 / 288

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Picking up new 8-3/4" PDC bit and BHA.

Planned Operations: Run in hole and continue drilling 8-3/4" hole to 7,500'

Toolpusher: Justin Bristol, Steve Caldwell

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	1:30	1.50	5,610	03-051	Trouble shoot MWD while circulating.	
1:30	6:00	4.50	5,610	3-6-2	Pulled out of the well bore laying down bit, mud motor and tools.	
6:00	8:00	2.00	5,610	3-34-3	Made up tools and ran in the hole.	
8:00	9:00	1.00	5,610	3-57	Filled pipe and took surveys.	
9:00	9:30	0.50	5,649	3-2-1	Rotate drilled 8-3/4"" hole from 5,610' to 5,649'.	
9:30	10:00	0.50	5,662	3-2-3	Slide drilled 8-3/4"hole from 5,649' to 5,662'.	
10:00	11:30	1.50	5,742	3-2-1	Rotate drilled 8-3/4" hole from 5,642' to 5,742'.	
11:30	12:30	1.00	5,759	3-2-3	Slide drilled 8-3/4" hole from 5,742' to 5,759'.	
12:30	16:00	3.50	5,827	3-2-1	Rotate drilled 8-3/4" hole from 5,759' to 5,827'.	
16:00	16:30	0.50	5,827	SERV	Serviced Rig.	
16:30	17:00	0.50	5,837	3-2-1	Rotate drilled 8-3/4" hole from 5,827; to 5,837'.	
17:00	19:00	2.00	5,852	3-2-3	Slide drilled8-3/4" hole from 5,837' to 5,852'.	
19:00	21:00	2.00	5,904	3-2-1	Rotate drilled 8-3/4" hole from 5,852' to ,5904'.	
21:00	22:00	1.00	5,920	3-2-3	Slide drilled 8-3/4" hole from 5,904' to 5,920'.	
22:00	23:30	1.50	5,920	3-2-1	Rotate drilled 8-3/4" hole from 5,920' to 5,973'.	
23:30	0:00	0.50	5,920	3-2-3	Slide drilled 8-3/4" hole from 5,973' to 5,978'.	

Management Summary

MWD and mud motor failed. Tripped for BHA #9. Drilled 8-3/4" hole from 5,610' to 5,978'.

Comments

Pulled out of the hole with green birt, motor had broken shaft.

Drilling in 100% Granodiorite.

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	16.30
FULL	9.625	0	0	3,494	3,488	INT1	12.250	36	J-55	16.00

Mud Information

								%							Gels			Temp		Mud
Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	Oil	Water	Sand	LGS	Cl	Ca	CaCl	10s	10m	30m	In	Out	Loss
17-Feb-21 20:00 at Depth 5,882 ft Mud Pits																				
8.70	44	15	18	10	1	10.5	6	0	94	1.25		1200	1200		5	8	13	111	125	

Daily Drilling Report

Well ID: Forge 56-32
Field: UTAHFORGE

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 14 **Report For 17-Feb-21**

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Barite - OTHER	24	---	caustic - OTHER	4	---
DC-310/CI-100 - OTHER	1	---	lime - OTHER	1	---
micro c - OTHER	10	---	PAllets/Wrap - OTHER	2	---
walnut Pine - OTHER	10	---	xanthan gum - OTHER	6	---

Bit/BHA/Workstring Information

No	Run	Make	Model	Diam	Depth In	This Run Dist	This Run Hrs	R.O.P. Avg	R.O.P. Max	WOB	RPM	Torque	Mud Wt	Mud Flow	Pump Press	J. Vel	P. Drp	HHP	JIF
8	1	REED	TKC63	8.750	5143	467	17.46	26.7	50.0	45	200	8	9	680	2800	242	455	181	741
Jets: 14 14 14 14 14 14					**Out:** 5610		**Grade:**	**Cutter:**	1 / 1	**Dull:**	NO / NO		**Wear:** A		**Brgs:** X	**Gge:** 1		**Pull:** DTF	
9	1	REED	TKC63	8.750	5610	368	14.5	25.4	40.0	50	200	8	9	680	2800	260	525	208	796
Jets: 14 14 14 13 13 13					**Out:** 5999		**Grade:**	**Cutter:**	1 / 1	**Dull:**	NO /		**Wear:** A		**Brgs:** X	**Gge:**		**Pull:** DMF	

BHA - No. 9 - BIT, MMTR, OTHER, STAB, MONEL, SHOCK, 12 DC, 24 HWDP = 1179.22

Miscellaneous Drilling Parameters

Hook Loads (lbs): **Off Bottom Rotate:** **Pick Up:** **Slack Off:** **Drag Avg/Max:** /

Slow Circulation Data:

Pump 1:	20 spm	170 psi	40 spm	290 psi	60 spm	490 psi
Pump 2:	20 spm	160 psi	40 spm	300 psi	60 spm	520 psi

Survey Information

Survey Type	Meas. Depth	Inc.	Azimuth	TVD	Closure	Vertical Section	Coordinates N-S	Coordinates E-W	D.L.S.
MWD	5,492.0	3.92	267.4	5,490.2	53.3	50.0	N 50.0	E 18.3	2.341
MWD	5,587.0	6.34	263.5	5,584.8	50.2	49.3	N 49.3	E 9.9	2.572
MWD	5,681.0	5.97	255.8	5,678.3	47.5	47.5	N 47.5	W 0.0	0.959
MWD	5,776.0	4.04	248.1	5,772.9	45.7	45.0	N 45.0	W 7.9	2.145
MWD	5,871.0	4.02	254.3	5,867.7	45.1	42.9	N 42.9	W 14.2	0.459

Mud Log Information

Depth (ft) From	Depth (ft) To	TVD (ft) From	TVD (ft) To	Gas (Units) Avg	Gas (Units) Max	Gas at Depth	Gas Connect.	Gas Trip	Drilling Exp.	Pore Press	Mud Dens.	Shale Dens.	ROP Shale	ROP Sand
5,880	5,890	5,878	5,888								8.70			
Formation Name:														
Lithology:	100% Granodiorite (Increase in mafic minerals eg. Homblende, Biotite													
5,890	5,990	5,888	5,988											
Formation Name:														
Lithology:	100% Granodiorite (Occasional pink K-spars)													

Rig Information

Equipment Problems:
Location Condition:
Transport:

Solids Control Information

Screen Sizes:	Top	Bottom
Shaker No 1:	170	
Shaker No 2:	170	
Shaker No 3:	140	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5	277	19.5	S-135	4.5IF					

Daily Drilling Report

Well ID: Forge 56-32
Field: UTAHFORGE

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 14 **Report For 17-Feb-21**

Safety Information

Meetings/Drills	Time	Description
Safety	60	Operating Fork Lift

First Aid Treatments:	Medical Treatments:	Lost Time Incidents:	Days Since LTI:

☐ BOP Test ☐ Crownamatic Check

Weather Information

Sky Condition:	Cloudy	**Visibility:**	10
Air Temperature:	14 degF	**Bar. Pressure:**	30.22
Wind Speed/Dir:	13 / N	**Wind Gusts:**	13

Daily Drilling Report

Geothermal Resource Group, Inc.

Well ID: Forge 56-32 **Job ID: Original** **Well Name: 56-32**

Field: UTAHFORGE Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 15 **Report For 18-Feb-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**		**Daily Cost / Mud ($):**			---
Measured Depth (ft):	6295	**Last Casing:**	9.625 at 3,494	**Wellbore:**	Original Wellbore	**AFE No.**	**AFE ($)**		**Actual ($)**
Vertical Depth (ft):	6293	**Next Casing:**	5.500 at 9,000	**RKB Elevation (ft):**	30.40	---	---		---
Proposed TD (ft):	9000	**Last BOP Test:**	12-Feb-21	**Job Reference RKB (ft):**	28.50	---	---		---
Hole Made (ft) / Hrs:	317 / 18.5	**Next BOP Test:**		**Working Interest:**		**Totals:**	---		---
Average ROP (ft/hr):	17.14			**LOT (lbs/gal):**	16.00	**Job/Well Cost ($):**			---
Drilling Days (act./plan):	11/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	11/38	**Days On Location:**			15
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 168	**Service:**	8 / 96	**Other:**	0 / 0	**Total:**	24 / 288

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Drilling 8-3/4" hole at 6,420' at 0600 hours.

Planned Operations: Drill 8-3/4" hole.

Toolpusher: Justin Bristol, Steve Caldwell

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	1:30	1.50	5,999	3-2-3	Slide drilled 8-3/4" hole from 5,978' to 5,999'.	
1:30	2:00	0.50	5,999	03-051	Circulated and motor pressured up.	
2:00	5:00	3.00	5,999	3-6-2	Pulled out of the well bore with broken shaft on mud motor.	
5:00	8:30	3.50	5,999	3-34-3	Made up bit and new BHA. Ran in the hole to shoe at 3,512'.	
8:30	9:30	1.00	5,999	CUTDL	Slipped and cut drilling line.	
9:30	10:30	1.00	5,999	3-6-1	Ran in the hole to 5,782'.	
10:30	11:00	0.50	5,999	3-3	Reamed 8-3/4" hole from 5,782' to 5,999'.	
11:00	12:00	1.00	6,053	3-2-2	Rotary drilled 8-3/4" hole from 5,999' to 6,053'.	
12:00	12:30	0.50	6,068	3-2-3	Slide drilled 8-3/4" hole from 6,053' to 6,068'.	
12:30	18:30	6.00	6,197	3-2-2	Rotary drilled 8-3/4" hole from 6,068' to 6,197'.	
18:30	20:00	1.50	6,222	3-2-3	Side drilled8-3/4" hole from 6,197' to 6,222'.	
20:00	0:00	4.00	6,222	3-2-2	Rotary drilled 8-3/4" hole from 6,222' to 6,295'.	

Management Summary

Tripped for new bit and BHA. Drilled 8-3/4" hole from 5,999' to 6,295' at 2400 hours.

Comments

Drilling in 100% Granodiorite (mnr-com biotite, rare chlorite

2 new mud motors on location.

Casing and well head on Sunday.

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	16.30
FULL	9.625	0	0	3,494	3,488	INT1	12.250	36	J-55	16.00

Mud Information

Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids %	Oil %	Water %	Sand %	LGS	Cl	Ca	CaCl	Gels 10s	Gels 10m	Gels 30m	Temp In	Temp Out	Mud Loss
18-Feb-21 21:00 at Depth 6,236 ft Mud Pits																				
8.70	46	15	15	9.6	1	10.5	6	0	94	1		1200	1200		6	9	17	95	111	

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Barite - OTHER	50	---	Gel - OTHER	15	---
micro c - OTHER	10	---	PAllets/Wrap - OTHER	3	---
walnut Pine - OTHER	14	---	xanthan gum - OTHER	4	---

Daily Drilling Report

Geothermal Resource Group, Inc.

Well ID: Forge 56-32 **Job ID: Original** **Well Name: 56-32**

Field: UTAHFORGE Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 15 **Report For** 18-Feb-21

Bit/BHA/Workstring Information

No	Run	Make	Model	Diam	Depth In	This Run Dist	This Run Hrs	R.O.P. Avg	R.O.P. Max	WOB	RPM	Torque	Mud Wt	Pump Flow	Pump Press	J. Vel	P. Drp	HHP	JIF
9	1	REED	TKC63	8.750	5610	368	14.5												
Jets: 14 14 14 13 13 13					Out: 5999		Grade:	Cutter:	1 / 1	Dull:	NO / NO		Wear: A		Brgs: X	Gge: 1		Pull: DMF	
10	1	REED	TKC73	8.750	5999	244	13	18.8					9	670	3300	253	498	195	763
Jets: 13 13 13 13 12 12 12					Out:		Grade:	Cutter:	/	Dull:	/		Wear:		Brgs:	Gge:		Pull:	

BHA - No. 10 - BIT, MMTR, OTHER, STAB, MONEL, 12 DC, 24 HWDP = 1169.59

Drilling Parameters

Depth (ft) From	Depth (ft) To	ROP (ft/hr) Avg	ROP (ft/hr) Max	WOB (lbs) Avg	WOB (lbs) Max	RPM Avg	RPM Max	Torque (ft lbs) Avg	Torque (ft lbs) Max	Flow (gals/min) Avg	Flow (gals/min) Max	Pressure (psi)
5,990	6,280	20.0	31.0	40	48	40	55	4	5	671	671	3,100

Annular Velocity: **Drill Collars:** 554.0 **Drill Pipe:** 351.0

Comments: MSE 75,000

Miscellaneous Drilling Parameters

Hook Loads (lbs): **Off Bottom Rotate:** 205 **Pick Up:** 240 **Slack Off:** 160 **Drag Avg/Max:** 35 / 35

Slow Circulation Data:

Pump 1:	20 spm	170 psi	40 spm	290 psi	60 spm	490 psi
Pump 2:	20 spm	160 psi	40 spm	300 psi	60 spm	520 psi

Survey Information

Survey Type	Meas. Depth	Inc.	Azimuth	TVD	Closure	Vertical Section	Coordinates N-S	Coordinates E-W	D.L.S.
MWD	5,954.0	4.02	231.5	5,950.5	44.6	40.3	N 40.3	W 19.3	1.919
MWD	6,049.0	3.45	191.9	6,045.3	41.9	35.4	N 35.4	W 22.5	2.716
MWD	6,144.0	2.73	190.1	6,140.2	38.4	30.4	N 30.4	W 23.5	0.765
MWD	6,238.0	0.77	198.5	6,234.1	36.6	27.6	N 27.6	W 24.1	2.097

Mud Log Information

Depth (ft) From	Depth (ft) To	TVD (ft) From	TVD (ft) To	Gas (Units) Avg	Gas (Units) Max	Gas at Depth	Gas Connect.	Gas Trip	Drilling Exp.	Pore Press	Mud Dens.	Shale Dens.	ROP Shale	ROP Sand
5,990	6,280	5,987	6,277											

Formation Name:

Lithology: 100% Granodiorite (mnr-com biotite, rare chlorite)

Rig Information

Equipment Problems:

Location Condition:

Transport:

Solids Control Information

Screen Sizes:	Top	Bottom
Shaker No 1:	170	
Shaker No 2:	170	
Shaker No 3:	140	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5	277	19.5	S-135	4.5IF					

Safety Information

Meetings/Drills	Time	Description
Safety	60	Drilling in reservoir

First Aid Treatments: **Medical Treatments:** **Lost Time Incidents:** **Days Since LTI:**

☐ **BOP Test** ☐ **Crownamatic Check**

Weather Information

Sky Condition:	Cloudy	**Visibility:**	10
Air Temperature:	21 degF	**Bar. Pressure:**	30.44
Wind Speed/Dir:	7 / ESE	**Wind Gusts:**	7

Daily Drilling Report

Well ID: Forge 56-32
Field: UTAHFORGE

Geothermal Resource Group, Inc.

Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 16 **Report For** 19-Feb-21

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**		**Daily Cost / Mud ($):**			---
Measured Depth (ft):	6765	**Last Casing:**	9.625 at 3,494	**Wellbore:**	Original Wellbore	**AFE No.**	**AFE ($)**		**Actual ($)**
Vertical Depth (ft):	6762	**Next Casing:**	5.500 at 9,000	**RKB Elevation (ft):**	30.40	---	---		---
Proposed TD (ft):	9000	**Last BOP Test:**	12-Feb-21	**Job Reference RKB (ft):**	28.50	---	---		---
Hole Made (ft) / Hrs:	470 / 23.5	**Next BOP Test:**		**Working Interest:**		**Totals:**	---		---
Average ROP (ft/hr):	20.0			**LOT (lbs/gal):**	16.00	**Well Cost ($):**			---
Drilling Days (act./plan):	12/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	12/38	**Days On Location:**			16
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 168	**Service:**	8 / 96	**Other:**	0 / 0	**Total:**	24 / 288

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: At 0600 hours, drilling 8-3/4" hole at 6,907'.

Planned Operations: Rotary and slide drill 8-3/4" hole.

Toolpusher: David Seddell, Vince Shaffer

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	9:30	9.50	6,490	3-2-2	Rotary drilled 8-3/4" hole from 6,295' to 6,490'.	
9:30	11:30	2.00	6,515	3-2-3	Slide drilled 8-3/4" hole from 6,490' to 6,515'.	
11:30	14:00	2.50	6,575	3-2-2	Rotary drilled 8-3/4" hole from 6,515' to 6,575'.	
14:00	14:30	0.50	6,575	SERV	Serviced Rig.	
14:30	15:00	0.50	6,585	3-2-2	Rotary drilled 8-3/4" hole from 6,575' to 6,585'.	
15:00	17:00	2.00	6,606	3-2-3	Slide drilled 8-3/4" hole from 6,585' to 6,606'	
17:00	19:30	2.50	6,672	3-2-2	Rotary drilled 8-3/4" hole from 6,606' to 6,672'.	
19:30	21:00	1.50	6,697	3-2-3	Slide drilled 8-3/4" hole from 6,672' to 6,697'.	
21:00	0:00	3.00	6,765	3-2-2	Rotary drilled 8-3/4" hole from 6,697' to 6,765'.	

Management Summary

Rotary and slide drilled 8-3/4" hole from 6,295' to 6,765' at 0600 hours.

Comments

Drilling in 100% Granodiorite

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	16.30
FULL	9.625	0	0	3,494	3,488	INT1	12.250	36	J-55	16.00

Mud Information

Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids %	Oil %	Water %	Sand %	LGS	Cl	Ca	CaCl	Gels 10s	Gels 10m	Gels 30m	Temp In	Temp Out	Mud Loss
19-Feb-21 20:00 at Depth 6,680 ft Mud Pits																				
8.80	46	17	19	9.8	1	10.5	7	0	93	1		1100	1200		6	9	16	101	117	

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
caustic - OTHER	2	---	Gel - OTHER	20	---
Gel - OTHER	16	---	lime - OTHER	1	---
micro c - OTHER	10	---	PAllets/Wrap - OTHER	3	---
walnut Pine - OTHER	36	---	xanthan gum - OTHER	3	---

Bit/BHA/Workstring Information

No	Run	Make	Model	Diam	Depth In	This Run Dist	This Run Hrs	R.O.P. Avg	R.O.P. Max	WOB	RPM	Torque	Mud Wt	Pump Flow	Pump Press	J. Vel	P. Drp	HHP	JIF
10	1	REED	TKC73	8.750	5999	714	36.5	19.6	28.0	45	200		9	670	3200	253	504	197	772

Jets: 13 13 13 13 12 12 12 **Out:** **Grade:** **Cutter:** / **Dull:** / **Wear:** **Brgs:** **Gge:** **Pull:**

BHA - No. 10 - BIT, MMTR, OTHER, STAB, MONEL, 12 DC, 24 HWDP = 1169.59

Daily Drilling Report

Well ID: Forge 56-32
Field: UTAHFORGE

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 16 **Report For 19-Feb-21**

Drilling Parameters

Depth (ft)		ROP (ft/hr)		WOB (lbs)		RPM		Torque (ft lbs)		Flow (gals/min)		Pressure
From	To	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	(psi)
6,420	6,460	23.0	25.0	43	45	29	30	5	5	669	669	3,131
Annular Velocity:	Drill Collars:	554.0	Drill Pipe:	351.0								
6,460	6,670	23.0	24.0	44	45	31	32	5	5	669	670	3,200
Annular Velocity:	Drill Collars:	554.0	Drill Pipe:	351.0								

Miscellaneous Drilling Parameters

Hook Loads (lbs):	Off Bottom Rotate:	210	Pick Up:	220	Slack Off:	180	Drag Avg/Max: 10 / 10

Slow Circulation Data:

Pump 1:	20 spm	170 psi	40 spm	290 psi	60 spm	490 psi
Pump 2:	20 spm	160 psi	40 spm	300 psi	60 spm	520 psi

Survey Information

Survey Type	Meas. Depth	Inc.	Azimuth	TVD	Closure	Vertical Section	Coordinates N-S	Coordinates E-W	D.L.S.
MWD	6,333.0	1.45	232.3	6,329.1	36.4	26.2	N 26.2	W 25.2	0.965
MWD	6,428.0	2.80	243.7	6,424.0	37.4	24.4	N 24.4	W 28.2	1.482
MWD	6,523.0	2.49	239.0	6,518.9	39.1	22.4	N 22.4	W 32.1	0.396
MWD	6,619.0	2.03	255.2	6,614.9	41.2	20.8	N 20.8	W 35.5	0.814
MWD	6,713.0	0.71	244.5	6,708.8	42.7	20.2	N 20.2	W 37.7	1.424
MWD	6,808.0	1.51	224.0	6,803.8	43.4	19.0	N 19.0	W 39.1	0.928

Mud Log Information

Depth (ft)		TVD (ft)		Gas (Units)			Gas		Drilling	Pore	Mud	Shale	ROP	
From	To	From	To	Avg	Max	at Depth	Connect.	Trip	Exp.	Press	Dens.	Dens.	Shale	Sand
6,420	6,460	6,417	6,457								8.80			
Formation Name:														
Lithology:	100% Granodiorite (pervasive hematization of amphiboles)													
6,460	6,670	6,457	6,667								8.80			
Formation Name:														
Lithology:	100% Granodiorite (notable calcite, rare-trace detrital epidote)													

Rig Information

Equipment Problems:
Location Condition:
Transport:

Solids Control Information

Screen Sizes:	Top	Bottom
Shaker No 1:	170	
Shaker No 2:	170	
Shaker No 3:	140	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5	277	19.5	S-135	4.5IF					

Safety Information

Meetings/Drills	Time	Description
Safety	60	Measuring casing, pinch points

First Aid Treatments: Medical Treatments: Lost Time Incidents: Days Since LTI:

☐ BOP Test ☐ Crownamatic Check

Weather Information

Sky Condition:	Clear	Visibility:	10
Air Temperature:	28 degF	Bar. Pressure:	30.08
Wind Speed/Dir:	14 / SSE	Wind Gusts:	20

Daily Drilling Report

Geothermal Resource Group, Inc.

Well ID: Forge 56-32 **Job ID: Original** **Well Name: 56-32**

Field: UTAHFORGE Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 17 **Report For 20-Feb-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**		**Daily Cost / Mud ($):**			---
Measured Depth (ft):	7207	**Last Casing:**	9.625 at 3,494	**Wellbore:**	Original Wellbore	**AFE No.**	**AFE ($)**		**Actual ($)**
Vertical Depth (ft):	7198	**Next Casing:**	5.500 at 9,000	**RKB Elevation (ft):**	30.40	---	---		---
Proposed TD (ft):	9000	**Last BOP Test:**	12-Feb-21	**Job Reference RKB (ft):**	28.50	---	---		---
Hole Made (ft) / Hrs:	442 / 23.0	**Next BOP Test:**		**Working Interest:**		**Totals:**	---		---
Average ROP (ft/hr):	19.22			**LOT (lbs/gal):**	16.00	**Job/Well Cost ($):**			---
Drilling Days (act./plan):	13/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	13/38	**Days On Location:**			17
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 168	**Service:**	8 / 96	**Other:**	0 / 0	**Total:**	24 / 288

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Drilling 8-3/4" hole at 7,235'.

Planned Operations: Drill 8-3/4" hole to 7,620' and pull out for "Mud Hammer".

Toolpusher: David Seddell, Vince Shaffer

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	8:30	8.50	6,965	3-2-2	Rotary drilled 8-3/4" hole from 6,765' to 6,965'.	
8:30	10:00	1.50	6,990	3-2-3	Slide drilled 8-3/4" hole from 6,965' to 6,990'.	
10:00	12:00	2.00	7,050	3-2-2	Rotary drilled 8-3/4" hole from 6,990' to 7,050'.	
12:00	12:30	0.50	7,050	SERV	Serviced Rig.	
12:30	13:00	0.50	7,060	3-2-2	Rotary drilled 8-3/4" hole from 7,050' to 7,060'.	
13:00	15:00	2.00	7,085	3-2-3	Slide drilled 8-3/4" hole from 7,060' to 7,085'.	
15:00	19:30	4.50	7,207	3-2-2	Rotary drilled 8-3/4" hole from 7,085' to 7,207'.	
19:30	20:00	0.50	7,207	3-5-1	Circulated bottoms up.	
20:00	0:00	4.00	7,207	3-6-2	Pulled out of the well bore laying down BHA and bit.	

Management Summary

Drilled 8-3/4" hole from 6,765' to 7,207'. Pulled out of the well bore laying down Bit #10 and BHA.

Comments

Bit 10 was grooved on shoulder and the discovery mud motor bearings were out.

Drilled in 100% Granodiorite with some heavy alterations at 6960' to 6980' with high percentage of biotite.

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	16.30
FULL	9.625	0	0	3,494	3,488	INT1	12.250	36	J-55	16.00

Mud Information

Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	% Oil	% Water	% Sand	LGS	Cl	Ca	CaCl	Gels 10s	Gels 10m	Gels 30m	Temp In	Temp Out	Mud Loss
20-Feb-21 20:00 at Depth 2,707 ft Mud Pits																				
8.70	47	17	20	10	1	10	6	0	94	0.75		1100	1160		5	9	17	103	111	

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Barite - OTHER	40	---	caustic - OTHER	2	---
Gel - OTHER	20	---	lime - OTHER	1	---
micro c - OTHER	15	---	PAllets/Wrap - OTHER	2	---
walnut Pine - OTHER	15	---	xanthan gum - OTHER	5	---

Daily Drilling Report

Geothermal Resource Group, Inc.

Well ID: Forge 56-32 **Job ID: Original** **Well Name: 56-32**

Field: UTAHFORGE Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 17 **Report For 20-Feb-21**

Bit/BHA/Workstring Information

No	Run	Make	Model	Diam	Depth In	This Run Dist	This Run Hrs	R.O.P. Avg	R.O.P. Max	WOB	RPM	Torque	Mud Wt	Pump Flow	Pump Press	J. Vel	P. Drp	HHP	JIF
10	1	REED	TKC73	8.750	5999	1,156	55.5	20.8	40.0	40	40		9	670	3100	253	498	195	763

Jets: 13 13 13 13 12 12 12 **Out:** 7207 **Grade:** **Cutter:** 3 / 8 **Dull:** BT / RO **Wear:** S **Brgs:** X **Gge:** 1 **Pull:** PR

BHA - No. 10 - BIT, MMTR, OTHER, STAB, MONEL, 12 DC, 24 HWDP = 1169.59

Drilling Parameters

Depth (ft) From	Depth (ft) To	ROP (ft/hr) Avg	ROP (ft/hr) Max	WOB (lbs) Avg	WOB (lbs) Max	RPM Avg	RPM Max	Torque (ft lbs) Avg	Torque (ft lbs) Max	Flow (gals/min) Avg	Flow (gals/min) Max	Pressure (psi)
6,910	6,980	20.0	23.0	40	45	40	50	6	7	670	670	3,100
Annular Velocity:	**Drill Collars:**	554.0	**Drill Pipe:**	351.0								
Comments:	Granodiorite											
6,980	7,200	23.0	30.0	45	50	45	55	7	8	670	670	3,150
Annular Velocity:	**Drill Collars:**	554.0	**Drill Pipe:**	351.0								
Comments:	Granodiortie											
6,670	6,910	22.0	24.0	45	48	40	50	6	7	670	670	3,100
Annular Velocity:	**Drill Collars:**	554.0	**Drill Pipe:**	351.0								
Comments:	Granodiorite											

Miscellaneous Drilling Parameters

Hook Loads (lbs): **Off Bottom Rotate:** 210 **Pick Up:** 220 **Slack Off:** 180 **Drag Avg/Max:** 10 / 10

Slow Circulation Data:

Pump 1:	20 spm	170 psi	40 spm	290 psi	60 spm	490 psi	
Pump 2:	20 spm	160 psi	40 spm	300 psi	60 spm	520 psi	

Mud Log Information

Depth (ft) From	Depth (ft) To	TVD (ft) From	TVD (ft) To	Gas (Units) Avg	Gas (Units) Max	Gas at Depth	Gas Connect.	Gas Trip	Drilling Exp.	Pore Press	Mud Dens.	Shale Dens.	ROP Shale	ROP Sand
6,670	6,910	6,665	6,905											
Formation Name:														
Lithology:	100% Granodiorite													
6,910	6,980	6,905	6,975											
Formation Name:														
Lithology:	100% Granodiorite (high percentage of biotite, recryst. Qtz, hematite													
6,980	7,200	6,975	7,195											
Formation Name:														
Lithology:	100% Granodiorite (Increase in pervasive chlorite)													

Rig Information

Equipment Problems:

Location Condition:

Transport:

Solids Control Information

Screen Sizes:	Top	Bottom
Shaker No 1:	170	
Shaker No 2:	170	
Shaker No 3:	140	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5	277	19.5	S-135	4.5IF					

Safety Information

Meetings/Drills	Time	Description
Safety	60	Making connections, mixing chemicals, pinch points.

First Aid Treatments: **Medical Treatments:** **Lost Time Incidents:** **Days Since LTI:**

☐ **BOP Test** ☐ **Crownamatic Check**

Weather Information

Sky Condition:	Cloudy	**Visibility:**	10
Air Temperature:	21 degF	**Bar. Pressure:**	30.28
Wind Speed/Dir:	14 / N	**Wind Gusts:**	14

Daily Drilling Report

Geothermal Resource Group, Inc.

Well ID: Forge 56-32 **Job ID: Original** **Well Name: 56-32**

Field: UTAHFORGE Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 18 **Report For 21-Feb-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**		**Daily Cost / Mud ($):**	---
Measured Depth (ft):	7620	**Last Casing:**	9.625 at 3,494	**Wellbore:**	Original Wellbore	**AFE No.** / **AFE ($)** / **Actual ($)**	
Vertical Depth (ft):	7615	**Next Casing:**	5.500 at 9,000	**RKB Elevation (ft):**	30.40	--- / --- / ---	
Proposed TD (ft):	9000	**Last BOP Test:**	12-Feb-21	**Job Reference RKB (ft):**	28.50	--- / --- / ---	
Hole Made (ft) / Hrs:	413 / 12.0	**Next BOP Test:**		**Working Interest:**		**Totals:** / --- / ---	
Average ROP (ft/hr):	34.42			**LOT (lbs/gal):**	16.00	**Job/Well Cost ($):**	---
Drilling Days (act./plan):	14/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	14/38	**Days On Location:**	18
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 168	**Service:**	11 / 132	**Other:** 0 / 0	**Total:** 27 / 324

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Pulling out of the hole.

Planned Operations: Pull out of the well bore and lay down Eaver 8-3/4" reamers. Run in the hole with Mud Hammer and drill 8-3/4" hole.

Toolpusher: David Seddell, Vince Shaffer

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	5:00	5.00	7,207	10-6-2	Made up Bit #11 and new BHA. Ran in the hole to 7,141'.	
5:00	5:30	0.50	7,207	3-3	Washed and reamed 8-3/4" hole from 7,141' to 7,208'.	
5:30	7:30	2.00	7,434	3-2-2	Rotary drilled 8-3/4" hole from 7,208' to 7,434'.	
7:30	8:30	1.00	7,460	3-2-3	Slide drilled 8-3/4" hole from 7,434' to 7,460'.	
8:30	11:00	2.50	7,620	3-2-2	Rotary drilled 8-3/4" hole from 7,560' to 7,620'.	
11:00	12:00	1.00	7,620	3-5-1	Circulated well bore clean.	
12:00	15:30	3.50	7,620	3-6-2	Pulled out of the well bore laying down bit and BHA.	
15:30	18:00	2.50	7,620	3-34-3	Made up mud hammer and BHA.	
18:00	18:30	0.50	7,620	3-6-1	Ran in the hole with BHA.	
18:30	21:30	3.00	7,620	3-34-4	Fill pipe and test hammer, pulled out to trouble shoot Mud Hammer, changed out jet and mud orifice.	
21:30	0:00	2.50	7,620	3-6-1	Ran in the hole with mud hammer	

Management Summary

Made up BHA #11 and ran in the well bore. Washed 8-3/4" hole from 7,141' to 7,208' and drilled 8-3/4" hole from 7,208' to 7,620'. Circulated well bore clean and pulled out of the hole laying down bit and BHA.

Comments

While running in the hole the drill string with mud motor and two full gauge roller reamer, BHA was stuck at 5,778' . The bottom 8-3/4" reamer was stuck 14' above the mud hammer. Worked string with torque and pull. Spotted Torquease around tool and worked pipe free.

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	16.30
FULL	9.625	0	0	3,494	3,488	INT1	12.250	36	J-55	16.00

Mud Information

Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids %	Oil %	Water %	Sand %	LGS	Cl	Ca	CaCl	Gels 10s	Gels 10m	Gels 30m	Temp In	Temp Out	Mud Loss
21-Feb-21 19:00 at Depth 7,620 ft Mud Pits																				
8.80	46	12	19	10.2	1	10.5	7	0	93	0.25		1100	1080		5	8	12	106	111	

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Barite - OTHER	80	---	Ben-EX - OTHER	3	---
lime - OTHER	3	---	mica - OTHER	14	---
micro c - OTHER	25	---	PAllets/Wrap - OTHER	2	---
soda ash - OTHER	1	---	walnut Pine - OTHER	5	---
xanthan gum - OTHER	4	---			

Daily Drilling Report

Well ID: Forge 56-32 **Job ID: Original**
Field: UTAHFORGE

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 18 **Report For 21-Feb-21**

Bit/BHA/Workstring Information

No	Run	Make	Model	Diam	Depth In	This Run Dist	This Run Hrs	R.O.P. Avg	R.O.P. Max	WOB	RPM	Torque	Mud Wt	Pump Flow	Pump Press	J. Vel	P. Drp	HHP	JIF
11	1	REED	TKC63	8.750	7207	413	4.96	83.3	307.0	40	40	6	9	670	3100	222	383	150	669
Jets: 14 14 14 13 13 13 13					**Out:** 7620			**Grade:**	**Cutter:**	1 / 1	**Dull:**	NO / NO	**Wear:** A		**Brgs:** X	**Gge:** 1		**Pull:** TD	
12	1		Hammer I	8.750	7620														
Jets:					**Out:**			**Grade:**	**Cutter:**	/	**Dull:**	/	**Wear:**		**Brgs:**	**Gge:**		**Pull:**	

BHA - No. 12 - BIT, 3 OTHER, RR, OTHER, MWD, RR, 12 DC, 24 HWDP, OTHER = 1182.64

Drilling Parameters

Depth (ft) From	Depth (ft) To	ROP (ft/hr) Avg	ROP (ft/hr) Max	WOB (lbs) Avg	WOB (lbs) Max	RPM Avg	RPM Max	Torque (ft lbs) Avg	Torque (ft lbs) Max	Flow (gals/min) Avg	Flow (gals/min) Max	Pressure (psi)
7,141	7,460	90.0	140.0	45	45	200	200			670	700	3,300

Annular Velocity: **Drill Collars:** 478.6 **Drill Pipe:** 318.5

Miscellaneous Drilling Parameters

Hook Loads (lbs): **Off Bottom Rotate:** 210 **Pick Up:** 220 **Slack Off:** 280 **Drag Avg/Max:** 10 / 10

Slow Circulation Data:

Pump 1:	20 spm	170 psi	40 spm	290 psi	60 spm	490 psi
Pump 2:	20 spm	160 psi	40 spm	300 psi	60 spm	520 psi

Survey Information

Survey Type	Meas. Depth	Inc.	Azimuth	TVD	Closure	Vertical Section	Coordinates N-S	Coordinates E-W	D.L.S.
MWD	6,902.0	2.28	226.0	6,897.8	44.6	16.8	N 16.8	W 41.3	0.822
MWD	6,998.0	2.12	223.1	6,993.7	46.1	14.2	N 14.2	W 43.9	0.202
MWD	7,093.0	1.58	233.5	7,088.6	47.7	12.1	N 12.1	W 46.1	0.667

Mud Log Information

Depth (ft) From	Depth (ft) To	TVD (ft) From	TVD (ft) To	Gas (Units) Avg	Gas (Units) Max	Gas at Depth	Gas Connect.	Gas Trip	Drilling Exp.	Pore Press	Mud Dens.	Shale Dens.	ROP Shale	ROP Sand
7,200	7,330	7,325	7,325											
Formation Name:														
Lithology:	100% Granodiorite (													
7,330	7,390	7,325	7,385											
Formation Name:														
Lithology:	100% Granodiorite													
7,390	7,440	7,385	7,435											
Formation Name:														
Lithology:	100% Granodiortie													
7,440	7,560	7,435	7,555											
Formation Name:														
Lithology:	100% Granodiorite													
7,560	7,580	7,555	7,575											
Formation Name:														
Lithology:	100% Granodiorite													
7,580	7,620	7,575	7,615											
Formation Name:														
Lithology:	100% Altered Zone (pervasive chlorite, calcite veining, hematite & epidote													

Rig Information

Equipment Problems:
Location Condition:
Transport:

Daily Drilling Report

Geothermal Resource Group, Inc.

Well ID: Forge 56-32 **Job ID: Original** **Well Name: 56-32**

Field: UTAHFORGE Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 18 **Report For 21-Feb-21**

Solids Control Information

Screen Sizes:	Top	Bottom
Shaker No 1:	170	
Shaker No 2:	170	
Shaker No 3:	140	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5	277	19.5	S-135	4.5IF					

Safety Information

Meetings/Drills	Time	Description
Safety	60	Connections in derrick.

First Aid Treatments:	Medical Treatments:	Lost Time Incidents:	Days Since LTI:

☐ BOP Test ☐ Crownamatic Check

Weather Information

Sky Condition:	Clear	Visibility:	10
Air Temperature:	19 degF	Bar. Pressure:	30.51
Wind Speed/Dir:	8 / ENE	Wind Gusts:	8

Daily Drilling Report

Geothermal Resource Group, Inc.

Well ID: Forge 56-32 **Job ID: Original** **Well Name: 56-32**

Field: UTAHFORGE Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 19 **Report For 22-Feb-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**		**Daily Cost / Mud ($):**			---
Measured Depth (ft):	7620	**Last Casing:**	9.625 at 3,494	**Wellbore:**	Original Wellbore	**AFE No.**	**AFE ($)**		**Actual ($)**
Vertical Depth (ft):	7615	**Next Casing:**	5.500 at 9,000	**RKB Elevation (ft):**	30.40	---	---		---
Proposed TD (ft):	9000	**Last BOP Test:**	12-Feb-21	**Job Reference RKB (ft):**	28.50	---	---		---
Hole Made (ft) / Hrs:	0 / 16.5	**Next BOP Test:**		**Working Interest:**		**Totals:**	---		---
Average ROP (ft/hr):	0.0			**LOT (lbs/gal):**	16.00	**Job/Well Cost ($):**			---
Drilling Days (act./plan):	15/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	15/38	**Days On Location:**			19
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 168	**Service:**	8 / 96	**Other:**	0 / 0	**Total:**	24 / 288

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Pulling out of the hole for the Mud Hammer.

Planned Operations: Trip for Mud Hammer and continue drilling 8-3/4" hole with mud hammer

Toolpusher: David Seddell, Vince Shaffer

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	1:00	1.00	7,620	3-6-1	Ran in the well bore with Mud Hammer to 5,790'.	
1:00	5:00	4.00	7,620	3-33	BHA stuck at 5,790' and worked string. Spotted torqueaze and worked pipe free.	
5:00	6:00	1.00	7,620	3-5-1	Circulated well bore clean.	
6:00	9:00	3.00	7,620	3-6-2	Pulled out of the hole laying down reamers.	
9:00	10:00	1.00	7,620	3-6-1	Ran in the hole with mud motor.	
10:00	10:30	0.50	7,620	3-97	Tested MWD.	
10:30	11:00	0.50	7,620	3-6-1	Ran in the hole to 5,790'.	
11:00	12:00	1.00	7,620	3-3	Reamed 8-3/4" hole from 5,790' to 5,850'. (Tagged up at 5,790')	
12:00	12:30	0.50	7,620	3-6-1	Ran in the hole to 6,920'.	
12:30	13:00	0.50	7,620	3-5-1	Circulated well bore clean.	
13:00	13:30	0.50	7,620	3-6-1	Ran in the hole to bottom at 7,620'.	
13:30	15:30	2.00	7,620	3-2-1	Attempted to hammer and rotate drilled 8-3/4" hole from 7,260' to 7,627'.	
15:30	16:00	0.50	7,620	3-5-1	Circulated well bore clean.	
16:00	19:30	3.50	7,620	3-6-2	Pulled out of the hole laying down mud hammer and tools.	
19:30	0:00	4.50	7,620	3-6-1	Made up bit and reaming assembly, RIH to 5,703'.	

Management Summary

Ran in the hole with mud motor to 5,790' and reamed 8-3/4" hole to 7,620'. Ran in the well bore to 7,620'. Attempted to mud hammer drill rotating and drilling 8-3/4" hole from 7,620' to 7,627'. Hammer did not fire. Pulled out of the hole laying down mud hammer and tools. Made up bit and reaming assembly and ran in the hole to 5,703'.

Comments

Reamed tight spots starting at 5,790' to 5,983' reaming several times and then sliding to make sure hole was good. Slid to bottom obstructed. Drilled 8-3/4" hole from 7,626' to 7,662.
When pulling out of hole, no drag or tight spot noticed around reamed areas. Hole slick.

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	16.30
FULL	9.625	0	0	3,494	3,488	INT1	12.250	36	J-55	16.00

Mud Information

Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	% Oil	% Water	% Sand	LGS	Cl	Ca	CaCl	Gels 10s	Gels 10m	Gels 30m	Temp In	Temp Out	Mud Loss
22-Feb-21 20:00 at Depth 7,627 ft Mud Pits																				
8.90	45	13	17	10.4	1	10.5	9	0	91	0.25		1100	1080		5	7	12	93	111	

Daily Drilling Report

Geothermal Resource Group, Inc.

Well ID: Forge 56-32 **Job ID: Original** **Well Name: 56-32**

Field: UTAHFORGE Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 19 **Report For 22-Feb-21**

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Barite - OTHER	40	---	Barite 50# bag - OTHER	80	---
caustic - OTHER	2	---	Defoamer - OTHER	3	---
lime - OTHER	1	---	PAllets/Wrap - OTHER	5	---
TorkEase - OTHER	5	---	xanthan gum - OTHER	1	---

Bit/BHA/Workstring Information

No	Run	Make	Model	Diam	Depth In	This Run Dist	This Run Hrs	R.O.P. Avg	R.O.P. Max	WOB	RPM	Torque	Mud Wt	Pump Flow	Pump Press	J. Vel	P. Drp	HHP	JIF
12	1		Hammer I	8.750	7620	0	0	0.0					9	450	2800				

Jets: **Out:** 7620 **Grade:** **Cutter:** 1 / 4 **Dull:** WT / RO **Wear:** S **Brgs:** X **Gge:** 1 **Pull:**

BHA - No. 12 - BIT, 3 OTHER, RR, OTHER, MWD, RR, 12 DC, 24 HWDP, OTHER = 1182.64

Rig Information

Equipment Problems:

Location Condition:

Transport:

Solids Control Information

Screen Sizes:	Top	Bottom
Shaker No 1:	170	
Shaker No 2:	170	
Shaker No 3:	140	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5	277	19.5	S-135	4.5IF					

Safety Information

Meetings/Drills	Time	Description
Safety	60	Tripping

First Aid Treatments: **Medical Treatments:** **Lost Time Incidents:** **Days Since LTI:**

☐ **BOP Test** ☐ **Crownamatic Check**

Weather Information

Sky Condition:	Clear	**Visibility:**	10
Air Temperature:	27 degF	**Bar. Pressure:**	30.27
Wind Speed/Dir:	6 / SSE	**Wind Gusts:**	6

Daily Drilling Report

Geothermal Resource Group, Inc.

Well ID: Forge 56-32 **Job ID: Original** **Well Name: 56-32**

Field: UTAHFORGE Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 20 **Report For 23-Feb-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**		**Daily Cost / Mud ($):**			---
Measured Depth (ft):	7666	**Last Casing:**	9.625 at 3,494	**Wellbore:**	Original Wellbore	**AFE No.**	**AFE ($)**		**Actual ($)**
Vertical Depth (ft):	7657	**Next Casing:**	5.500 at 9,000	**RKB Elevation (ft):**	30.40	---	---		---
Proposed TD (ft):	9000	**Last BOP Test:**	12-Feb-21	**Job Reference RKB (ft):**	28.50	---	---		---
Hole Made (ft) / Hrs:	46 / 14.0	**Next BOP Test:**		**Working Interest:**		**Totals:**	---		---
Average ROP (ft/hr):	3.29			**LOT (lbs/gal):**	16.00	**Job/Well Cost ($):**			---
Drilling Days (act./plan):	16/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	16/38	**Days On Location:**			20
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 168	**Service:**	12 / 144	**Other:**	0 / 0	**Total:**	28 / 336

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Slipped and cut drilling line. Running in the hole to drill 8-3/4" hole with PDC.

Planned Operations: Continue drilling 8-3/4" hole with PDC. Trouble shoot mud hammer.

Toolpusher: David Seddell, Vince Shaffer

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	3:00	3.00	7,627	3-3	Reamed 8-3/4" hole from 5,703' to 5,983'.	
3:00	4:00	1.00	7,627	3-6-1	Ran in the hole un-obstructed from 5,983' to 7,600'.	
4:00	4:30	0.50	7,627	3-3	Washed and reamed 8-3/4" hole from 7,600' to 7,627'.	
4:30	5:30	1.00	7,662	3-2-2	Rotary drilled 8-3/4" hole from 7,627' to 7,662'.	
5:30	6:00	0.50	7,662	3-5-1	Circulated hole clean.	
6:00	9:00	3.00	7,662	3-6-2	Pulled out of the well bore laying down BHA.	
9:00	13:00	4.00	7,662	3-34-3	Made up mud hammer and ran in the hole to 5500'.	
13:00	17:00	4.00	7,666	3-2-2	Attempt to initiate mud hammer to work. Rotary drilled with hammer from 7,662' to 7,666'.	
17:00	22:00	5.00	7,666	3-6-2	Pulled out of the hole laying down mud hammer and tools.	
22:00	0:00	2.00	7,666	OTHER	Ran mud hammer in mouse hole and tested hammer. Hammer would not fire.	

Management Summary

Reamed 8-3/4" hole from 5,703' to 5,983' with 2 full gauge roller reamers. Ran to bottom and drilled 8-3/4" hole from 7,627' to 7,662'. Pulled out of the hole laying down bit and tools. Made up mud hammer and ran in the hole and attempted to initiate mud hammer firing while rotating from 7,262' to 7,666'. Pulled out of the well bore laying down tools. Ran mud hammer in mouse hole and tested hammer which did not fire.

Comments

Tested Mud Hammer in mouse hole, set weight on mud hammer and started pumps, hammer did not fire

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	16.30
FULL	9.625	0	0	3,494	3,488	INT1	12.250	36	J-55	16.00

Mud Information

Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	% Oil	% Water	% Sand	LGS	Cl	Ca	CaCl	Gels 10s	Gels 10m	Gels 30m	Temp In	Temp Out	Mud Loss
23-Feb-21 19:00 at Depth 7,666 ft Mud Pits																				
9.00	42	13	15	11	1	10	8	0	92	0.1		900	1360		4	6	10	103	111	

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Barite - OTHER	32	---	Barite 50# bag - OTHER	80	---
lime - OTHER	1	---	PAllets/Wrap - OTHER	3	---
xanthan gum - OTHER	10	---			

Daily Drilling Report

Geothermal Resource Group, Inc.

Well ID: Forge 56-32 **Job ID: Original** **Well Name: 56-32**

Field: UTAHFORGE Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 20 **Report For 23-Feb-21**

Bit/BHA/Workstring Information

No	Run	Make	Model	Diam	Depth In	This Run Dist	This Run Hrs	R.O.P. Avg	R.O.P. Max	WOB	RPM	Torque	Mud Wt	Pump Flow	Pump Press	J. Vel	P. Drp	HHP	JIF
11	2	REED	TKC63	8.750	7627	35	1	35.0	61.0	35	55	12	9	550	3100	210	348	112	526

Jets: 13 13 13 14 14 14 **Out:** 7662 **Grade:** **Cutter:** 1 / 1 **Dull:** CT / NO **Wear:** A **Brgs:** X **Gge:** 1 **Pull:** TD

BHA - No. 13 - BIT, STAB, DC, RR, DC, RR, 10 DC, JAR, 24 HWDP = 1150.72

Mud Log Information

Depth (ft) From	Depth (ft) To	TVD (ft) From	TVD (ft) To	Gas (Units) Avg	Gas (Units) Max	Gas at Depth	Gas Connect.	Gas Trip	Drilling Exp.	Pore Press	Mud Dens.	Shale Dens.	ROP Shale	ROP Sand
7,620	7,660	7,615	7,655								8.80			

Formation Name:

Lithology: 40-50% altered zone (Abundnt biotite, weak foliation, increase in large euhed epidote, no calicite) 50-60% Granodiorite (overall increase in secondary mineralization)

Rig Information

Equipment Problems:

Location Condition:

Transport:

Solids Control Information

Screen Sizes:	Top	Bottom
Shaker No 1:	170	
Shaker No 2:	170	
Shaker No 3:	140	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5	277	19.5	S-135	4.5IF					

Safety Information

Meetings/Drills	Time	Description
Safety	60	Tripping

First Aid Treatments: **Medical Treatments:** **Lost Time Incidents:** **Days Since LTI:**

☐ BOP Test ☐ Crownamatic Check

Weather Information

Sky Condition:	Clear	**Visibility:**	10
Air Temperature:	21 degF	**Bar. Pressure:**	30.14
Wind Speed/Dir:	7 / S	**Wind Gusts:**	7

Daily Drilling Report

Geothermal Resource Group, Inc.

Well ID: Forge 56-32 **Job ID: Original** **Well Name: 56-32**

Field: UTAHFORGE Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 21 **Report For 24-Feb-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**		**Daily Cost / Mud ($):**			---
Measured Depth (ft):	8353	**Last Casing:**	9.625 at 3,494	**Wellbore:**	Original Wellbore	**AFE No.**	**AFE ($)**		**Actual ($)**
Vertical Depth (ft):	8348	**Next Casing:**	5.500 at 9,000	**RKB Elevation (ft):**	30.40	---	---		---
Proposed TD (ft):	9000	**Last BOP Test:**	12-Feb-21	**Job Reference RKB (ft):**	28.50	---	---		---
Hole Made (ft) / Hrs:	687 / 21.0	**Next BOP Test:**		**Working Interest:**		**Totals:**	---		---
Average ROP (ft/hr):	32.71			**LOT (lbs/gal):**	16.00	**Job/Well Cost ($):**			---
Drilling Days (act./plan):	17/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	17/38	**Days On Location:**			21
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 168	**Service:**	11 / 132	**Other:**	0 / 0	**Total:**	27 / 324

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Drilling 8-3/4" hole at 8,471' at 0600 hours.

Planned Operations: Rotary and slide drill 8-3/4" hole.
Plan to test EAVOR mud hammer in the mouse hole today. If successful, will attempt to drill with hammer, after logs.

Toolpusher: David Seddell, Vince Shaffer

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	4:00	4.00	7,666	03-061	Made up bit and tools. Ran in hole to 3,561'.	
4:00	6:00	2.00	7,666	CUTDL	Slipped and cut 100' to drilling line.	
6:00	7:30	1.50	7,666	3-6-1	Ran in the hole to bottom at 7,666'.	
7:30	8:00	0.50	7,751	3-2-2	Rotary drilled 8-3/4" hole from 7,666' to 7,751'.	
8:00	8:30	0.50	7,776	3-2-3	Slide drilled 8-3/4" hole from 7,751' to 7,776'.	
8:30	9:30	1.00	7,846	3-2-2	Rotary drilled 8-3/4" hole from 7,776' to 7,846'.	
9:30	10:30	1.00	7,871	3-2-3	Slide drilled 8-3/4" hole from 7,846' to 7,871'.	
10:30	12:30	2.00	8,000	3-2-2	Rotary drilled 8-3/4" hole from 7,871' to 8,000'.	
12:30	13:00	0.50	8,000	3-5-1	Circulated bottoms up.	
13:00	13:30	0.50	8,000	3-6-2	Pulled out of the hole from 8,000' to 7,750'.	
13:30	14:00	0.50	8,000	3-3	Reamed 8-3/4" hole from 7,750' to 8,000'.	
14:00	14:30	0.50	8,035	3-2-2	Rotary drilled 8-3/4" hole from 8,000' to 8,035'.	
14:30	16:00	1.50	8,065	3-2-3	Slide drilled 8-3/4" hole from 8,035' to 8,065'.	
16:00	18:00	2.00	8,140	3-2-2	Rotary drilled 8-3/4" hole from 8,065' to 8,140'.	
18:00	18:30	0.50	8,147	3-2-3	Slide drilled 8-3/4" hole from 8,140' to 8,147'.	
18:30	0:00	5.50	8,353	3-2-2	Rotary drilled 8-3/4" hole from 8,147' to 8,353'.	

Management Summary

Made up bit and BHA. Ran in the well bore to 3,561'. Slipped and cut 100' of drilling line. Ran to bottom at 7,666'. Rotary and slide drilled 8-3/4" hole from 7,666' to 8,353'.

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	16.30
FULL	9.625	0	0	3,494	3,488	INT1	12.250	36	J-55	16.00

Mud Information

Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids %	Oil %	Water %	Sand %	LGS	Cl	Ca	CaCl	Gels 10s	Gels 10m	Gels 30m	Temp In	Temp Out	Mud Loss
24-Feb-21 21:00 at Depth 8,238 ft Mud Pits																				
9.00	40	40	12	10.6	1	10.5	8	0	92	0.1		1200	1200		4	5	9	107	127	

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Bicarb - OTHER	5	---	caustic - OTHER	4	---
Defoamer - OTHER	1	---	lime - OTHER	2	---
soda ash - OTHER	6	---	xanthan gum - OTHER	11	---

Daily Drilling Report

Well ID: Forge 56-32 **Job ID: Original**
Field: UTAHFORGE

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 21 **Report For 24-Feb-21**

Bit/BHA/Workstring Information

No Run	Make	Model	Diam	Depth In	This Run Dist	This Run Hrs	R.O.P. Avg	R.O.P. Max	WOB	RPM	Torque	Mud Wt	Mud Flow	Pump Press	J. Vel	P. Drp	HHP	JIF
13 1	REED	TKC63	8.750	7666	687	15.5	44.3	120.0	30	190	9	9	670	3250	256	528	206	799

Jets: 13 13 13 14 14 14 **Out:** **Grade:** **Cutter:** / **Dull:** / **Wear:** **Brgs:** **Gge:** **Pull:**

BHA - No. 14 - BIT, MMTR, OTHER, STAB, MONEL, 12 DC, 24 HWDP = 1227.95

Drilling Parameters

Depth (ft) From	Depth (ft) To	ROP (ft/hr) Avg	ROP (ft/hr) Max	WOB (lbs) Avg	WOB (lbs) Max	RPM Avg	RPM Max	Torque (ft lbs) Avg	Torque (ft lbs) Max	Flow (gals/min) Avg	Flow (gals/min) Max	Pressure (psi)
8,100	8,110	60.0	107.0	43	45	40	41	8	11	654	654	3,100
Annular Velocity:	**Drill Collars:**	478.0	**Drill Pipe:**	318.0								
8,110	8,260	32.0	146.0	41	44	55	57	5	15	654	654	3,200
Annular Velocity:	**Drill Collars:**	478.0	**Drill Pipe:**	318.0								
8,260	8,340	30.0	122.0	40	42	40	43	7	12	654	654	3,300
Annular Velocity:	**Drill Collars:**	478.0	**Drill Pipe:**	318.0								

Survey Information

Survey Type	Meas. Depth	Inc.	Azimuth	TVD	Closure	Vertical Section	Coordinates N-S	Coordinates E-W	D.L.S.
MWD	7,788.0	2.83	205.1	7,783.1	58.8	-9.9	S 9.9	W 58.0	1.040
MWD	7,883.0	2.40	187.5	7,878.0	60.9	-14.0	S 14.0	W 59.2	0.952
MWD	7,977.0	3.49	215.5	7,971.9	63.8	-18.2	S 18.2	W 61.2	1.888
MWD	8,071.0	1.86	235.8	8,065.8	67.6	-21.4	S 21.4	W 64.1	1.979
MWD	8,166.0	0.75	258.7	8,160.8	69.7	-22.4	S 22.4	W 66.0	1.268
MWD	8,260.0	1.39	294.0	8,254.7	71.1	-22.1	S 22.1	W 67.6	0.948
MWD	8,355.0	2.45	290.6	8,349.7	73.6	-20.9	S 20.9	W 70.6	1.122

Mud Log Information

Depth (ft) From	Depth (ft) To	TVD (ft) From	TVD (ft) To	Gas (Units) Avg	Gas (Units) Max	Gas at Depth	Gas Connect.	Gas Trip	Drilling Exp.	Pore Press	Mud Dens.	Shale Dens.	ROP Shale	ROP Sand
7,810	7,860										9.00			
Formation Name:														
Lithology:	100% Granodiorite (increase in secondary mineralization eg. chlorite, calcite, epidote)													
7,860	8,100										9.00			
Formation Name:														
Lithology:	100% Granodiorite (minimal alteration, primarily rare chlorite-minor chlorite)													
8,100	8,110										9.00			
Formation Name:														
Lithology:	100% Quartz Monzonite (possible felsic dike, but contained decreased quartz & increased K-spar)													
8,110	8,210										9.00			
Formation Name:														
Lithology:	100 Granodiorite, (0-80% altered zone, with felsic dike @ 8120') Significant increase in secondary calcite.													
8,210	8,260										9.00			
Formation Name:														
Lithology:	100% Quartz Monzonite from 8210-8240', 100% Granodiorite from 8240-8260'.													
8,260	8,340	8,260									9.00			
Formation Name:														
Lithology:	100% Syenite (except at 8280', appears to be 50/50 Quartz Monzonite/Syenite)													

Rig Information

Equipment Problems:

Location Condition:

Transport:

Daily Drilling Report

Geothermal Resource Group, Inc.

Well ID: Forge 56-32 **Job ID: Original** **Well Name: 56-32**

Field: UTAHFORGE Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 21 **Report For 24-Feb-21**

Solids Control Information

Screen Sizes:	Top	Bottom
Shaker No 1:	170	
Shaker No 2:	170	
Shaker No 3:	140	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5	277	19.5	S-135	4.5IF					

Safety Information

Meetings/Drills	Time	Description
Safety	60	Connections

First Aid Treatments:	Medical Treatments:	Lost Time Incidents:	Days Since LTI:

☐ BOP Test ☐ Crownamatic Check

Weather Information

Sky Condition:	Clear	Visibility:	10
Air Temperature:	18 degF	Bar. Pressure:	30.44
Wind Speed/Dir:	18 / N	Wind Gusts:	20

Daily Drilling Report

Geothermal Resource Group

Well ID: Forge 56-32 **Job ID: Original** **Well Name: 56-32**

Field: UTAHFORGE Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 22 **Report For 25-Feb-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**		**Daily Cost / Mud ($):**			---
Measured Depth (ft):	8810	**Last Casing:**	9.625 at 3,494	**Wellbore:**	Original Wellbore	**AFE No.**	**AFE ($)**		**Actual ($)**
Vertical Depth (ft):	8800	**Next Casing:**	5.500 at 9,000	**RKB Elevation (ft):**	30.40	---	---		---
Proposed TD (ft):	9000	**Last BOP Test:**	12-Feb-21	**Job Reference RKB (ft):**	28.50	---	---		---
Hole Made (ft) / Hrs:	457 / 24.0	**Next BOP Test:**		**Working Interest:**		**Totals:**	---		---
Average ROP (ft/hr):	19.04			**LOT (lbs/gal):**	16.00	**Job/Well Cost ($):**			---
Drilling Days (act./plan):	18/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	18/38	**Days On Location:**			22
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 168	**Service:**	12 / 144	**Other:**	0 / 0	**Total:**	28 / 336

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Pulling out of the well bore from 8900' for new BHA.

Planned Operations: Change bits and BHA and drill 8-3/4" hole to TD.

Toolpusher: David Seddell, Vince Shaffer

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	2:00	2.00	8,404	DRILR	Rotate drilled 8-3/4" hole from 8353' to 8404'.	
2:00	4:30	2.50	8,434	DRILS	Slide drilled 8-3/4" hole from 8404' to 8434'.	
4:30	10:30	6.00	8,598	DRILR	Rotate drilled 8-3/4" hole from 8434' to 8598'.	
10:30	12:00	1.50	8,611	DRILS	Slide drilled 8-3/4" hole from 8598' to 8611'.	
12:00	12:30	0.50	8,627	DRILR	Rotate drilled 8-3/4" hole from 8611' to 8627'.	
12:30	14:00	1.50	8,642	DRILS	Slide drilled 8-3/4" hole from 8627' to 8642'.	
14:00	15:00	1.00	8,661	DRILR	Rotate drilled 8-3/4" hole from 8642' to 8661'.	
15:00	16:00	1.00	8,676	DRILS	Slide drilled 8-3/4" hole from 8661' to 8676'.	
16:00	17:00	1.00	8,693	DRILR	Rotate drilled 8-3/4" hole from 8676' to 8693'.	
17:00	18:30	1.50	8,708	DRILS	Slide drilled 8-3/4" hole from 8693' to 8708'.	
18:30	19:00	0.50	8,728	DRILR	Rotary drilled 8-3/4" hole from 8708' to 8728'.	
19:00	20:00	1.00	8,743	DRILS	Slide drilled 8-3/4" hole from 8728' to 8743'.	
20:00	20:30	0.50	8,758	DRILR	Rotary drilled 8-3/4" hole from 8743' to 8758'.	
20:30	21:30	1.00	8,773	DRILS	Slide drilled 8-3/4" hole from 8758' to 8773'.	
21:30	22:00	0.50	8,785	DRILR	Rotary drilled 8-3/4"hole from 8773' to 8785'.	
22:00	0:00	2.00	8,810	DRILS	Slide drilled 8-3/4" hole from 8785' to 8810'.	

Management Summary

Rotary and slide drilled 8-3/4" hole from 8353' to 8810'.

Comments

Fighting strong trend requiring slide drilling to keep angle down. Formation appears to be in transition from Granodiorite to Gneiss with with gneissic banding, rexin of quartz, significant biotite and alternating felds/quartz.

Drill rate dropped from 42'/hour to 4'/hour at bottom while rotating.

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	16.30
FULL	9.625	0	0	3,494	3,488	INT1	12.250	36	J-55	16.00

Mud Information

Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids %	Oil %	Water %	Sand %	LGS %	Cl	Ca	CaCl	Gels 10s	Gels 10m	Gels 30m	Temp In	Temp Out	Mud Loss
25-Feb-21 19:30 at Depth 8,737 ft Mud Pits																				
9.00	42	14	16	10.8	1	10.5	8	0	92	0.1		1200	1120		4	5	9	108	118	

Daily Drilling Report

Geothermal Resource Group

Well ID: Forge 56-32 **Job ID: Original** **Well Name: 56-32**

Field: UTAHFORGE Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 22 **Report For 25-Feb-21**

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
caustic - OTHER	2	---	lime - OTHER	1	---
PAllets/Wrap - OTHER	3	---	soda ash - OTHER	5	---
xanthan gum - OTHER	8	---			

Bit/BHA/Workstring Information

BHA - No. 14 - BIT, MMTR, OTHER, STAB, MONEL, 12 DC, 24 HWDP = 1227.95

Miscellaneous Drilling Parameters

Hook Loads (lbs):	**Off Bottom Rotate:**	240	**Pick Up:**	310	**Slack Off:**	190	**Drag Avg/Max:** 40 / 70

Slow Circulation Data:

Pump 1:	20 spm	170 psi	40 spm	290 psi	60 spm	490 psi
Pump 2:	20 spm	160 psi	40 spm	300 psi	60 spm	520 psi

Mud Log Information

Depth (ft) From	Depth (ft) To	TVD (ft) From	TVD (ft) To	Gas (Units) Avg	Gas (Units) Max	Gas at Depth	Gas Connect.	Gas Trip	Drilling Exp.	Pore Press	Mud Dens.	Shale Dens.	ROP Shale	ROP Sand
8,520	8,610													
Formation Name:														
Lithology:	100% Granodiorite, (absent calcite, rare hematite & chlorite)													
8,610	8,840													
Formation Name:														
Lithology:	100% Granodiorite (rare-trace calcite, trace chlorite)													
8,840	8,870													
Formation Name:														
Lithology:	0-60 Granodiorite, (gneissic banding, granodiorite exhibiting minimal migmatitic texture in quartz)													
8,340	8,400										8.90			
Formation Name:														
Lithology:	40-90% Granodiorite, 0-20% Syenite, 0-40% Altered zone with rare to minor epidote.													
8,400	8,520													
Formation Name:														
Lithology:	100% Granodiorite with trace calcite, rare trace chlorite													

Rig Information

Equipment Problems:

Location Condition:

Transport:

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5	277	19.5	S-135	4.5IF					

Safety Information

Meetings/Drills	Time	Description
Safety	60	High temperature mud.

First Aid Treatments: **Medical Treatments:** **Lost Time Incidents:** **Days Since LTI:**

☐ **BOP Test** ☐ **Crownamatic Check**

Weather Information

Sky Condition:	Clear	**Visibility:**	10
Air Temperature:	19 degF	**Bar. Pressure:**	30.2
Wind Speed/Dir:	6 / E	**Wind Gusts:**	6

Daily Drilling Report

Geothermal Resource Group, Inc.

Well ID: Forge 56-32 **Job ID: Original** **Well Name: 56-32**

Field: UTAHFORGE Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 23 **Report For 26-Feb-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**		**Daily Cost / Mud ($):**			---
Measured Depth (ft):	8900	**Last Casing:**	9.625 at 3,494	**Wellbore:**	Original Wellbore	**AFE No.**	**AFE ($)**		**Actual ($)**
Vertical Depth (ft):	8894	**Next Casing:**	5.500 at 9,000	**RKB Elevation (ft):**	30.40	---	---		---
Proposed TD (ft):	9000	**Last BOP Test:**	12-Feb-21	**Job Reference RKB (ft):**	28.50	---	---		---
Hole Made (ft) / Hrs:	90 / 16.0	**Next BOP Test:**		**Working Interest:**		**Totals:**	---		---
Average ROP (ft/hr):	5.63			**LOT (lbs/gal):**	16.00	**Job/Well Cost ($):**			---
Drilling Days (act./plan):	19/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	19/38	**Days On Location:**			23
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 168	**Service:**	8 / 96	**Other:**	0 / 0	**Total:**	24 / 288

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Frinished drilling 8-3/4" hole to TD (9,145'). Pulling out of the hole for E-Logs.

Planned Operations: Finish pulling out of the hole, rig up and run E-Logs and core side wall samples.

Toolpusher: David Seddell, Vince Shaffer

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	1:00	1.00	8,855	3-2-2	Rotary drilled 8-3/4" hole from 8,810' to 8,855'.	
1:00	2:00	1.00	8,871	3-2-3	Slide drilled 8-3/4" hole from 8,855' to 8,871'.	
2:00	3:00	1.00	8,900	3-2-2	Rotary drilled 8-3/4" hole from 8,871' to 8,900'.	
3:00	4:00	1.00	8,900	3-5-1	Circulated well bore clean.	
4:00	9:00	5.00	8,900	3-6-1	Pulled out of the hole laying down bit and tools.	
9:00	14:00	5.00	8,900	OTHER	Tested 2 mud hammers in "Mouse Hole" with mud and water. Hammers worked with water but not with mud.	
14:00	21:30	7.50	8,900	3-6-1	Made up bit and BHA 15 and staged in the hole 2,200-7,651' cooling well bore.	
21:30	22:00	0.50	8,900	3-6-1	Ran in the hole and encountered tight spot at 7651', jarred drill string free and worked tight spot to 8,188'.	
22:00	0:00	2.00	8,900	3-3	Reamed 8-3/4" hole from 8,188' to 8,923'.	

Management Summary

Drilled 8-3/4" hole from 8,810' to 8,900' sliding and rotating. Pulled out of the well bore and tested mud hammers in "Mouse Hole". Hammers worked on water but failed on mud. Made up BHA15 and ran in the hole to 7,651' and encountered tight hole. Reamed 8-3/4" hole to 8,923'.

Comments

While tripping in the well bore encountered very tight hole from 7651' to bottom.

Drilled 8-3/4" hole from 8810' to TD at 9145' MD, 9138' TVD at 0450 hours, 2-27-2021.

Bottom hole samples have not been analyzed yet due to fast P-Rates however samples indicate Gneiss formation with very little alteration.

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	16.30
FULL	9.625	0	0	3,494	3,488	INT1	12.250	36	J-55	16.00

Mud Information

Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids %	Oil %	Water %	Sand %	LGS %	Cl	Ca	CaCl	Gels 10s	Gels 10m	Gels 30m	Temp In	Temp Out	Mud Loss
26-Feb-21 17:00 at Depth 8,900 ft Mud Pits																				
9.00	42	15	14	10.4	1	10.5	8	0	92	0.1		1200	1122		4	5	9	108	118	

Bit/BHA/Workstring Information

No	Run	Make	Model	Diam	Depth In	This Run Dist	This Run Hrs	R.O.P. Avg	R.O.P. Max	WOB	RPM	Torque	Mud Wt	Pump Flow	Pump Press	J. Vel	P. Drp	HHP	JIF
13	1	REED	TKC63	8.750	7666	1,212	42.5	28.5	61.0	45	40	12	9	697	3100	266	571	232	865
Jets: 13 13 13 14 14 14					**Out:** 8900		**Grade:**	**Cutter:**	8 / 2	**Dull:**	BT / BT		**Wear:** S	**Brgs:** X	**Gge:** 1		**Pull:** PR		
14	1	REED	TKC813	8.750	8900														
Jets: 14 14 14 14 11 11 11 11					**Out:**		**Grade:**	**Cutter:**	/	**Dull:**	/		**Wear:**	**Brgs:**	**Gge:**		**Pull:**		

BHA - No. 15 - BIT, MMTR, OTHER, STAB, MONEL, 12 DC, JAR, 24 HWDP = 1202.18

Daily Drilling Report

Geothermal Resource Group, Inc.

Well ID: Forge 56-32 **Job ID: Original** **Well Name: 56-32**

Field: UTAHFORGE Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 23 **Report For 26-Feb-21**

Drilling Parameters

Depth (ft) From	Depth (ft) To	ROP (ft/hr) Avg	ROP (ft/hr) Max	WOB (lbs) Avg	WOB (lbs) Max	RPM Avg	RPM Max	Torque (ft lbs) Avg	Torque (ft lbs) Max	Flow (gals/min) Avg	Flow (gals/min) Max	Pressure (psi)
8,810	8,900	30.0	80.0	45	45	190	190	9	9	670	670	

Annular Velocity: **Drill Collars:** 478.6 **Drill Pipe:** 318.5

Miscellaneous Drilling Parameters

Hook Loads (lbs): **Off Bottom Rotate:** **Pick Up:** **Slack Off:** **Drag Avg/Max:** /

Slow Circulation Data:

Pump 1:	20 spm	170 psi	40 spm	290 psi	60 spm	490 psi
Pump 2:	20 spm	160 psi	40 spm	300 psi	60 spm	520 psi

Mud Log Information

Depth (ft) From	Depth (ft) To	TVD (ft) From	TVD (ft) To	Gas (Units) Avg	Gas (Units) Max	Gas at Depth	Gas Connect.	Gas Trip	Drilling Exp.	Pore Press	Mud Dens.	Shale Dens.	ROP Shale	ROP Sand
8,840	8,900										9.00			

Formation Name:

Lithology: 40-100% Gneiss (gneissic banding, significant biotite, rexin & migmatic texture in quartz)

Rig Information

Equipment Problems:

Location Condition:

Transport:

Solids Control Information

Screen Sizes:	Top	Bottom
Shaker No 1:	170	
Shaker No 2:	170	
Shaker No 3:	140	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5	277	19.5	S-135	4.5IF					

Safety Information

Meetings/Drills	Time	Description
Safety	60	Tripping

First Aid Treatments: **Medical Treatments:** **Lost Time Incidents:** **Days Since LTI:**

☐ **BOP Test** ☐ **Crownamatic Check**

Weather Information

Sky Condition:	Cloudy	**Visibility:**	10
Air Temperature:	18 degF	**Bar. Pressure:**	29.73
Wind Speed/Dir:	16 / SW	**Wind Gusts:**	20

Daily Drilling Report

Geothermal Resource Group, Inc.

Well ID: Forge 56-32 **Job ID: Original** **Well Name: 56-32**

Field: UTAHFORGE Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 24 **Report For 27-Feb-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**		**Daily Cost / Mud ($):**			---
Measured Depth (ft):	9145	**Last Casing:**	9.625 at 3,494	**Wellbore:**	Original Wellbore	**AFE No.**	**AFE ($)**		**Actual ($)**
Vertical Depth (ft):	9138	**Next Casing:**	5.500 at 9,000	**RKB Elevation (ft):**	30.40	---	---		---
Proposed TD (ft):	9000	**Last BOP Test:**	12-Feb-21	**Job Reference RKB (ft):**	28.50	---	---		---
Hole Made (ft) / Hrs:	245 / 9.5	**Next BOP Test:**		**Working Interest:**		**Totals:**	---		---
Average ROP (ft/hr):	25.79			**LOT (lbs/gal):**	16.00	**Job/Well Cost ($):**			---
Drilling Days (act./plan):	20/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	20/38	**Days On Location:**			24
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 168	**Service:**	8 / 96	**Other:**	0 / 0	**Total:**	24 / 288

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Circulating to cool well bore for core log.

Planned Operations: Cool well bore and run coring tool on E-Line.

Toolpusher: Steve Caldwell, Vince Shaffer

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	0:30	0.50	8,900	3-3	Reamed 8-3/4" hole to 8900'.	
0:30	1:00	0.50	8,900	3-2-2	Rotary drilled 8-3/4" hole from 8900' to 8923'.	
1:00	2:00	1.00	8,948	3-2-3	Slide drilled 8-3/4" hole from 8923' to 8948'.	
2:00	2:30	0.50	9,000	3-2-2	Rotary drilled 8-3/4" hole from 8948' to 9000'.	
2:30	3:30	1.00	9,025	3-2-3	Slide drilled 8-3/4" hole from 9000' to 9025'.	
3:30	5:00	1.50	9,145	3-2-2	Rotary drilled 8-3/4" hole from 9025' to TD of 9145'.	
5:00	5:30	0.50	9,145	3-5-1	Circulated well bore clean.	
5:30	10:30	5.00	9,145	3-6-2	Pulled out of the hole laying down bit, tools and drill collars.	
10:30	14:00	3.50	9,145	10-343	Made up logging bit, float and tools on HWDP and ran in the hole to 9145'.	
14:00	15:00	1.00	9,145	10-5-1	Circulated and cooled well bore.	
15:00	18:00	3.00	9,145	10-11	Rigged up loggers and picked up tools. Ran in to bottom through drill pipe with wire line.	
18:00	18:30	0.50	9,145	10-11	Rigged down wire line unit and pump in sub.	
18:30	0:00	5.50	9,145	10-11	Pulled out of the hole with Triple Combo and Gyro 30'/minute.	

Management Summary

Slide and rotary drilled 8-3/4" hole from 8,923' to 9,145' TD. Circulated well bore clean and pulled out of the hole. Laid down bit, tools and drill collars. Made up logging bit and tools. Ran in the hole to 9,145' and circulated to cool well bore. Pulled out of the hole at 30'/min with Gryro and Triple Combo.

Comments

Bottom hole temperature coming off bottom was 305 degrees F. Caliper Density Pad failed.

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	16.30
FULL	9.625	0	0	3,494	3,488	INT1	12.250	36	J-55	16.00

Mud Information

Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids %	Oil %	Water %	Sand %	LGS	Cl	Ca	CaCl	Gels 10s	Gels 10m	Gels 30m	Temp In	Temp Out	Mud Loss
27-Feb-21 15:00 at Depth 9,145 ft Mud Pits																				
9.00	40	13	17	12	1	10	8	0	92	0.1		1200	1100		3	6	9	113	128	

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Barite - OTHER	168	---	Defoamer - OTHER	2	---
soda ash - OTHER	2	---			

Daily Drilling Report

Geothermal Resource Group, Inc.

Well ID: Forge 56-32 **Job ID:** Original **Well Name:** 56-32

Field: UTAHFORGE Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 24 **Report For** 27-Feb-21

Bit/BHA/Workstring Information

No Run	Make	Model	Diam	Depth In	This Run Dist	This Run Hrs	R.O.P. Avg	R.O.P. Max	WOB	RPM	Torque	Mud Wt	Mud Flow	Pump Press	J. Vel	P. Drp	HHP	JIF
14 1	REED	TKC813	8.750	8900	245	3.2	76.6	160.0	45	40	15	9	650	3500	214	370	140	649

Jets: 14 14 14 14 11 11 11 11 **Out:** 9145 **Grade:** **Cutter:** 1 / 1 **Dull:** NO / NO **Wear:** A **Brgs:** X **Gge:** 1 **Pull:** TD

BHA - No. 15 - BIT, MMTR, OTHER, STAB, MONEL, 12 DC, JAR, 24 HWDP = 1202.18

Drilling Parameters

Depth (ft) From	Depth (ft) To	ROP (ft/hr) Avg	ROP (ft/hr) Max	WOB (lbs) Avg	WOB (lbs) Max	RPM Avg	RPM Max	Torque (ft lbs) Avg	Torque (ft lbs) Max	Flow (gals/min) Avg	Flow (gals/min) Max	Pressure (psi)
8,900	945	140.0	80.0	45	45	190	190	9	9	670	670	

Annular Velocity: **Drill Collars:** 478.6 **Drill Pipe:** 318.5

Miscellaneous Drilling Parameters

Hook Loads (lbs): **Off Bottom Rotate:** **Pick Up:** **Slack Off:** **Drag Avg/Max:** /

Slow Circulation Data:

Pump 1:	20 spm	170 psi	40 spm	290 psi	60 spm	490 psi
Pump 2:	20 spm	160 psi	40 spm	300 psi	60 spm	520 psi

Survey Information

Survey Type	Meas. Depth	Inc.	Azimuth	TVD	Closure	Vertical Section	Coordinates N-S	Coordinates E-W	D.L.S.
MWD	8,927.0	2.44	260.7	8,920.5	99.6	-15.1	S 15.1	W 98.4	4.249
MWD	9,021.0	1.84	230.1	9,014.5	102.9	-16.4	S 16.4	W 101.6	1.348
MWD	9,093.0	2.99	239.9	9,086.4	105.6	-18.1	S 18.1	W 104.1	1.690
MWD	9,145.0	2.99	239.9	9,138.3	108.2	-19.5	S 19.5	W 106.4	0.000

Rig Information

Equipment Problems:

Location Condition:

Transport:

Solids Control Information

Screen Sizes:	Top	Bottom
Shaker No 1:	170	
Shaker No 2:	170	
Shaker No 3:	140	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5	277	19.5	S-135	4.5IF					

Safety Information

Meetings/Drills	Time	Description
Safety	60	Logging and tripping

First Aid Treatments: **Medical Treatments:** **Lost Time Incidents:** **Days Since LTI:**

☐ **BOP Test** ☐ **Crownamatic Check**

Weather Information

Sky Condition:	Cloudy	**Visibility:**	10
Air Temperature:	16 degF	**Bar. Pressure:**	30.19
Wind Speed/Dir:	5 / N	**Wind Gusts:**	5

Daily Drilling Report

Geothermal Resource Group, Inc.

Well ID: Forge 56-32 **Job ID: Original** **Well Name: 56-32**

Field: UTAHFORGE Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 25 **Report For 28-Feb-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**	08-Feb-21	**Daily Cost / Mud ($):**			---
Measured Depth (ft):	9145	**Last Casing:**	9.625 at 3,494	**Wellbore:**	Original Wellbore	**AFE No.**		**AFE ($)**	**Actual ($)**
Vertical Depth (ft):	9138	**Next Casing:**	5.500 at 9,000	**RKB Elevation (ft):**	30.40	---		---	---
Proposed TD (ft):	9000	**Last BOP Test:**	12-Feb-21	**Job Reference RKB (ft):**	28.50	---		---	---
Hole Made (ft) / Hrs:	0 / 0.0	**Next BOP Test:**		**Working Interest:**		**Totals:**		---	---
Average ROP (ft/hr):				**LOT (lbs/gal):**	16.00	**Job/Well Cost ($):**			---
Drilling Days (act./plan):	21/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	21/38	**Days On Location:**			25
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 168	**Service:**	9 / 108	**Other:**	0 / 0	**Total:**	25 / 300

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Laying down drill pipe.

Planned Operations: Lay down drill pipe and run 5.5" casing.

Toolpusher: Steve Caldwell, Vince Shaffer

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	2:00	2.00	9,145	10-11	Rigged down loggers and download data.	
2:00	5:00	3.00	9,145	10-6-1	Ran in the hole to 9,145'.	
5:00	7:00	2.00	9,145	10-5-1	Circulate to cool well bore for wire-line coring.	
7:00	10:00	3.00	9,145	10-6-2	Pulled out of the hole.	
10:00	19:00	9.00	9,145	10-11	Rigged up loggers and run side core logs. Rigged down loggers.	
19:00	20:00	1.00	9,145	10-6-3	Ran in the well bore to 3,489'.	
20:00	21:30	1.50	9,145	10-99	Slip and cut 85' of drilling line.	
21:30	23:00	1.50	9,145	10-6-3	Ran in the hole to TD at 9,145'.	
23:00	0:00	1.00	9,145	10-5-1	Circulated to cool well bore.	

Management Summary

Rigged down Schlumberger and ran in the hole to 9145' TD. Circulated to cool well bore. Pulled out of the hole and ran Schlumberger side cores. Ran in the hole and circulated to cool well bore at 2400 hours.

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	16.30
FULL	9.625	0	0	3,494	3,488	INT1	12.250	36	J-55	16.00

Mud Information

Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids %	Oil %	Water %	Sand %	LGS	Cl	Ca	CaCl	Gels 10s	Gels 10m	Gels 30m	Temp In	Temp Out	Mud Loss
28-Feb-21 15:00 at Depth 9,145 ft Mud Pits																				
9.00	38	13	6	11	1	10	8	0	92	0.1		1100	320			1	5	93	111	

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
amberguard - OTHER	6	---	caustic - OTHER	2	---
DC-310/CI-100 - OTHER	3	---			

Rig Information

Equipment Problems:

Location Condition:

Transport:

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5	277	19.5	S-135	4.5IF					

Daily Drilling Report

Well ID: Forge 56-32 **Job ID: Original**
Field: UTAHFORGE

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 25 **Report For 28-Feb-21**

Safety Information

Meetings/Drills	Time	Description
Safety	60	Laying down pipe and pinch points.

First Aid Treatments:	Medical Treatments:	Lost Time Incidents:	Days Since LTI:

☐ BOP Test ☐ Crownamatic Check

Weather Information

Sky Condition:	Clear	**Visibility:**	10
Air Temperature:	12 degF	**Bar. Pressure:**	30.46
Wind Speed/Dir:	7 / NE	**Wind Gusts:**	7

Daily Drilling Report

Geothermal Resource Group, Inc.

Well ID: Forge 56-32 **Job ID: Original** **Well Name: 56-32**

Field: UTAHFORGE Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 26 **Report For 01-Mar-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**	08-Feb-21	**Daily Cost / Mud ($):**			---
Measured Depth (ft):	9145	**Last Casing:**	9.625 at 3,494	**Wellbore:**	Original Wellbore	**AFE No.**		**AFE ($)**	**Actual ($)**
Vertical Depth (ft):	9138	**Next Casing:**	5.500 at 9,000	**RKB Elevation (ft):**	30.40	---		---	---
Proposed TD (ft):	9000	**Last BOP Test:**	12-Feb-21	**Job Reference RKB (ft):**	28.50	---		---	---
Hole Made (ft) / Hrs:	0 / 0.0	**Next BOP Test:**		**Working Interest:**		**Totals:**		---	---
Average ROP (ft/hr):				**LOT (lbs/gal):**	16.00	**Job/Well Cost ($):**			---
Drilling Days (act./plan):	22/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	22/38	**Days On Location:**			26
Pers/Hrs:	**Operator:** 2 / 24	**Contractor:**	14 / 168	**Service:**	9 / 108	**Other:**	0 / 0	**Total:**	25 / 300

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Running 5-1/2" casing.

Planned Operations: Run and cement 5-1/2" 17 ppf, L-80, Buttress casing.

Toolpusher: Steve Caldwell, Vince Shaffer

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	12:00	12.00	9,145	11-342	Laid down drill pipe and heavy wall drill pipe, bit and subs.	
12:00	15:30	3.50	9,145	6-99	Nippled down BOPE and picked up with rig. Cut off casing and removed slips, installed BOPE.	
15:30	0:00	8.50	9,145	4-12-1	Rigged up and ran 5-1/2" 17 ppf, L-80, Buttress Liner equipped with Fiber Optics cable attached to the liner.	

Management Summary

Laid down drill pipe and tools. Cut and removed 9-5/8" X 13-3/8" slips. Rigged up and ran 5-1/2" 17 ppf, L-80, Buttress Liner equipped with fiber optic cable.

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	16.30
FULL	9.625	0	0	3,494	3,488	INT1	12.250	36	J-55	16.00

Mud Information

Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids	% Oil	% Water	% Sand	LGS	Cl	Ca	CaCl	Gels 10s	Gels 10m	Gels 30m	Temp In	Temp Out	Mud Loss
01-Mar-21 17:00 at Depth 9,145 ft Mud Pits																				
9.00	38	13	7	10	1	10	8	0	92	0.1		1200	320		1	4	10	103	130	

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
amberguard - OTHER	10	---	Bicarb - OTHER	7	---
Gel - OTHER	48	---	mica - OTHER	18	---

Rig Information

Equipment Problems:

Location Condition:

Transport:

Solids Control Information

Screen Sizes:	Top	Bottom
Shaker No 1:	170	
Shaker No 2:	170	
Shaker No 3:	140	

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5	277	19.5	S-135	4.5IF					

Daily Drilling Report

Well ID: Forge 56-32 **Job ID: Original**
Field: UTAHFORGE

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 26 **Report For 01-Mar-21**

Safety Information

Meetings/Drills	Time	Description
Safety	60	Running casing.

First Aid Treatments:	Medical Treatments:	Lost Time Incidents:	Days Since LTI:

☐ BOP Test ☐ Crownamatic Check

Weather Information

Sky Condition:	Clear	**Visibility:**	10
Air Temperature:	19 degF	**Bar. Pressure:**	30.21
Wind Speed/Dir:	4 / SSE	**Wind Gusts:**	5

Daily Drilling Report

Geothermal Resource Group, Inc.

Well ID: Forge 56-32 **Job ID: Original** **Well Name: 56-32**

Field: UTAHFORGE Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 27 **Report For 02-Mar-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**	08-Feb-21	**Daily Cost / Mud ($):**			---
Measured Depth (ft):	9145	**Last Casing:**	5.500 at 9,105	**Wellbore:**	Original Wellbore	**AFE No.**		**AFE ($)**	**Actual ($)**
Vertical Depth (ft):	9138	**Next Casing:**		**RKB Elevation (ft):**	30.40	---		---	---
Proposed TD (ft):	9000	**Last BOP Test:**	12-Feb-21	**Job Reference RKB (ft):**	28.50	---		---	---
Hole Made (ft) / Hrs:	0 / 0.0	**Next BOP Test:**		**Working Interest:**		**Totals:**		---	---
Average ROP (ft/hr):						**Job/Well Cost ($):**			---
Drilling Days (act./plan):	23/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	23/38	**Days On Location:**			27
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 168	**Service:**	17 / 204	**Other:**	0 / 0	**Total:**	33 / 396

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Waiting on cement and tools.

Planned Operations: Secure cement and tools. Execute top down cement job.

Toolpusher: Steve Caldwell, Vince Shaffer

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	7:00	7.00	9,145	4-12-1	Ran 5-1/2" 17 ppf, L-88, Buttress casing equipped with fiber optic cable to 7,280'.	
7:00	8:00	1.00	9,145	03-051	Circulated to cool and clean well bore.	
8:00	9:30	1.50	9,145	4-12-1	Ran 5-1/2" 17 ppf, L-80, Buttress casing equipped with fiber optic cable to 8,192'.	
9:30	10:00	0.50	9,145	03-051	Circulated to cool well bore.	
10:00	11:30	1.50	9,145	4-12-1	Ran 5-1/2" 17 ppf, L-80, Buttress casing equipped with fiber optic cable to 9,130'.	
11:30	13:00	1.50	9,145	03-051	Circulated to cool well bore.	
13:00	16:30	3.50	9,145	5-99	Rigged up cementer, pumped cement with pressure increasing to 6000 psi. Worked pipe to 9,105' attempting to free pack off. Attempted to pump wiper plug with instant pressure build up.	
16:30	17:00	0.50	9,145	11-47	Closed Annular Preventer and pumped 330 barrels down back side to clear annulus of cement.	
17:00	0:00	7.00	9,145	3-32	Waited on cement and tools.	

Management Summary

Ran 5-1/2" 17 ppf L-80 Liner equipped with fiber optic cable to 9,133'. Mixed and pumped cement, pressure increased to 6,000 psi. Casing packed off, attempted to free casing and worked pipe to 9,105'. Attempted to displace liner wiper plug and fluid would not move. Closed annular preventer and displaced 330 barrels of fluid to clear 9-5/8" X 5-1/2" annular for "Top Down" cement job. Waited on cement and tools to top job.

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	16.30
FULL	9.625	0	0	3,494	3,488	INT1	12.250	36	J-55	16.00
LINER	5.500	0		9,105						

Mud Information

Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids %	Oil %	Water %	Sand %	LGS	Cl	Ca	CaCl	Gels 10s	Gels 10m	Gels 30m	Temp In	Temp Out	Mud Loss
02-Mar-21 13:00 at Depth 9,145 ft Mud Pits																				
9.00	34	14	4		1	9	3	0	97	0.1										

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
micro c - OTHER	5	---			

Rig Information

Equipment Problems:

Location Condition:

Transport:

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
5	277	19.5	S-135	4.5IF					

Daily Drilling Report

Geothermal Resource Group, Inc.

Well ID: Forge 56-32 **Job ID: Original** **Well Name: 56-32**

Field: UTAHFORGE Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 27 **Report For 02-Mar-21**

Safety Information

Meetings/Drills	Time	Description
Safety	60	Flashing mud

First Aid Treatments:	Medical Treatments:	Lost Time Incidents:	Days Since LTI:

☐ BOP Test ☐ Crownamatic Check

Weather Information

Sky Condition:	Clear	**Visibility:**	10
Air Temperature:	23 degF	**Bar. Pressure:**	30
Wind Speed/Dir:	12 / SSE	**Wind Gusts:**	15

Daily Drilling Report

Geothermal Resource Group, Inc.

Well ID: Forge 56-32 **Job ID: Original** **Well Name: 56-32**

Field: UTAHFORGE Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 28 **Report For 03-Mar-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**	08-Feb-21	**Daily Cost / Mud ($):**			---
Measured Depth (ft):	9145	**Last Casing:**	5.500 at 9,105	**Wellbore:**	Original Wellbore	**AFE No.**	**AFE ($)**		**Actual ($)**
Vertical Depth (ft):	9138	**Next Casing:**		**RKB Elevation (ft):**	30.40	---	---		---
Proposed TD (ft):	9000	**Last BOP Test:**	12-Feb-21	**Job Reference RKB (ft):**	28.50	---	---		---
Hole Made (ft) / Hrs:	0 / 0.0	**Next BOP Test:**		**Working Interest:**		**Totals:**	---		---
Average ROP (ft/hr):						**Job/Well Cost ($):**			---
Drilling Days (act./plan):	24/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	24/38	**Days On Location:**			28
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 168	**Service:**	3 / 28	**Other:**	0 / 0	**Total:**	19 / 220

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Waiting on cement and preparing for Top Squeeze and Top Fill cement job.

Planned Operations: Perform "Top Squeeze" cement job for the 9-5/8" X 5-1/2" casing annulus.

Toolpusher: Steve Caldwell, Vince Shaffer

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	0:00	24.00	9,145	3-32	Waited on cement for "Top Down" cement job and tools for clean out. Cut and laid down 25' of 5-1/2" liner at KB level. Removed flow line and check valve in kill line. Made preparations for Top Down cement job.	

Management Summary

Made preparations for "Top Squeeze/Top Fill" cement job..

Comments

Received tools for cleaning out cement. Partial load of 2-7/8" drill pipe.

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	16.30
FULL	9.625	0	0	3,494	3,488	INT1	12.250	36	J-55	16.00
LINER	5.500	0		9,105						

Mud Information

Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids %	Oil %	Water %	Sand %	LGS	Cl	Ca	CaCl	Gels 10s	Gels 10m	Gels 30m	Temp In	Temp Out	Mud Loss
03-Mar-21 17:00 at Depth 9,145 ft Mud Pits																				
8.70	36																			

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
xanthan gum - OTHER	10	---			

Rig Information

Equipment Problems:

Location Condition:

Transport:

Safety Information

Meetings/Drills	Time	Description
Safety	60	Squeezing

First Aid Treatments: **Medical Treatments:** **Lost Time Incidents:** **Days Since LTI:**

☐ BOP Test ☐ Crownamatic Check

Weather Information

Sky Condition:	Clear	**Visibility:**	10
Air Temperature:	23 degF	**Bar. Pressure:**	30.1
Wind Speed/Dir:	4 / SE	**Wind Gusts:**	4

Daily Drilling Report

Well ID: Forge 56-32 **Job ID: Original**
Field: UTAHFORGE

Geothermal Resource Group, Inc.

Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 29 **Report For 04-Mar-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**	08-Feb-21	**Daily Cost / Mud ($):**			---
Measured Depth (ft):	9145	**Last Casing:**	5.500 at 9,105	**Wellbore:**	Original Wellbore	**AFE No.**		**AFE ($)**	**Actual ($)**
Vertical Depth (ft):	9138	**Next Casing:**		**RKB Elevation (ft):**	30.40	---		---	---
Proposed TD (ft):	9000	**Last BOP Test:**	12-Feb-21	**Job Reference RKB (ft):**	28.50	---		---	---
Hole Made (ft) / Hrs:	0 / 0.0	**Next BOP Test:**		**Working Interest:**		**Totals:**		---	---
Average ROP (ft/hr):						**Job/Well Cost ($):**			---
Drilling Days (act./plan):	25/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	25/38	**Days On Location:**			29
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 168	**Service:**	8 / 96	**Other:**	0 / 0	**Total:**	24 / 288

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Making up 4-3/4" bit and tools, running in the hole.

Planned Operations: Clean out cement to 8,967'.

Toolpusher: Steve Caldwell, Vince Shaffer

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	13:30	13.50	9,145	3-13	Waited on cement. Cut off casing and laid down cementing equipment. Rigged down casing equipment and unloaded 2-7/8" drill pipe, 4" drill collars and running tools.	
13:30	17:00	3.50	9,145	5-12-2	Performed "Top Squeeze" cement job with Annular closed and pumping through kill line Resource Cementing pumped25 barrels of H2O ahead to break down formation at 820 psi, followed by 167 barrels of 15.6 ppg Top Squeeze Cement with 200 psi. CIP at 1624 hours.	
17:00	21:30	4.50	9,145	1-14	Nippled down BOPE and removed 9-5/8" casing head.	
21:30	0:00	2.50	9,145	3-97	Weld on well head.	

Management Summary

Cut off 5-1/2" casing and laid down cementing equipment. Performed "Top Squeeze" cement job pumping 25 barrels of water ahead to break down formation at 820 psi, followed by 167 barrels of 15.6 ppg "Top Squeeze" cement with final pressure of 200 psi. CIP at 1624 hours. Nippled down and removed 9-5/8" well head. Cleaned up and welded on 5-1/2" well head.

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	16.30
FULL	9.625	0	0	3,494	3,488	INT1	12.250	36	J-55	16.00
LINER	5.500	0		9,105						

Mud Information

Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	Solids %	Oil %	Water %	Sand %	LGS	Cl	Ca	CaCl	Gels 10s	Gels 10m	Gels 30m	Temp In	Temp Out	Mud Loss
04-Mar-21 14:00 at Depth 9,145 ft Mud Pits																				
8.50	32	5	4	14	1	8.5	2	0	98	0.1		800	320				3	60		

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Bicarb - OTHER	49	---	PAllets/Wrap - OTHER	2	---

Rig Information

Equipment Problems:

Location Condition:

Transport:

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
2.875	295	10.4	G-105	OTHER					

Daily Drilling Report

Well ID: Forge 56-32 **Job ID: Original**
Field: UTAHFORGE

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 29 **Report For 04-Mar-21**

Safety Information

Meetings/Drills	Time	Description
Safety	60	BOPE

First Aid Treatments:	Medical Treatments:	Lost Time Incidents:	Days Since LTI:

☐ BOP Test ☐ Crownamatic Check

Weather Information

Sky Condition:	Clear	**Visibility:**	10
Air Temperature:	25 degF	**Bar. Pressure:**	30.24
Wind Speed/Dir:	9 / E	**Wind Gusts:**	9

Daily Drilling Report

Geothermal Resource Group, Inc.

Well ID: Forge 56-32 **Job ID: Original** **Well Name: 56-32**

Field: UTAHFORGE Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 30 **Report For 05-Mar-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**	08-Feb-21	**Daily Cost / Mud ($):**			---
Measured Depth (ft):	9145	**Last Casing:**	5.500 at 9,105	**Wellbore:**	Original Wellbore	**AFE No.**		**AFE ($)**	**Actual ($)**
Vertical Depth (ft):	9138	**Next Casing:**		**RKB Elevation (ft):**	30.40	---		---	---
Proposed TD (ft):	9000	**Last BOP Test:**	12-Feb-21	**Job Reference RKB (ft):**	28.50	---		---	---
Hole Made (ft) / Hrs:	0 / 0.0	**Next BOP Test:**		**Working Interest:**		**Totals:**		---	---
Average ROP (ft/hr):						**Job/Well Cost ($):**			---
Drilling Days (act./plan):	26/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	26/38	**Days On Location:**			30
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 168	**Service:**	4 / 48	**Other:**	0 / 0	**Total:**	20 / 240

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Cleaning out cement at 3,228'.

Planned Operations: Clean out cement to 8,997'.

Toolpusher: Steve Caldwell, Justin Bristol

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	1:30	1.50	9,145	3-97	Weld on 5-1/5" well head.	
1:30	3:30	2.00	9,145	3-97	Flanged up flow line, installed chains on flow nipple, set catwalk and mouse hole.	
3:30	5:30	2.00	9,145	3-97	Rigged up tongs for 2-7/8" drill pipe and tools, strapped drill pipe.	
5:30	8:00	2.50	9,145	4-6-1	Made up bit collars and tools. Ran in the well bore and tagged top of cement at 731'.	
8:00	10:30	2.50	9,145	4-34-1	Picked up 10 stands of drill pipe and stood back in derrick.	
10:30	16:30	6.00	9,145	7-28	Drilled out cement float at 820' and drilled out cement fro 820' to 1709'.	
16:30	17:00	0.50	9,145	SERV	Serviced Rig.	
17:00	21:30	4.50	9,145	10-6-2	Pulled out of the well bore and changed BHA for mud motor and PDC bit. Ran in the hole.	
21:30	0:00	2.50	9,145	7-28	Cleaned out cement from 1709' to 2666'.	

Management Summary

Welded on 5-1/2" well head and flanged up riser pipe, rotating head and flow line. Rigged up tongs and tools. Made up bit, mud motor and tools. Ran in the well bore and tagged top of wiper plug at 731'. Picked up stands and placed them in the derrick. Cleaned out cement from 731' to 2,366' at 2400 hours.

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	16.30
FULL	9.625	0	0	3,494	3,488	INT1	12.250	36	J-55	16.00
LINER	5.500	0		9,105						

Bit/BHA/Workstring Information

No	Run	Make	Model	Diam	Depth In	This Run Dist	This Run Hrs	R.O.P. Avg	R.O.P. Max	WOB	RPM	Torque	Mud Wt	Pump Flow	Pump Press	J. Vel	P. Drp	HHP	JIF
15	1	REED	JZ	4.750	731					3	120	1	8	200	1200	70	37	4	61

Jets: 20 20 20 **Out:** 1709 **Grade:** **Cutter:** 1 / 1 **Dull:** NO / NO **Wear:** A **Brgs:** 1 **Gge:** 1 **Pull:** OTH

BHA - No. 17 - BIT, MMTR, XO, 6 DC = 193.27

Rig Information

Equipment Problems:

Location Condition:

Transport:

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
2.875	295	10.4	G-105	OTHER					

Daily Drilling Report

Well ID: Forge 56-32 **Job ID: Original**
Field: UTAHFORGE

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 30 **Report For 05-Mar-21**

Safety Information

Meetings/Drills	Time	Description
Safety	60	Tripping

First Aid Treatments:	Medical Treatments:	Lost Time Incidents:	Days Since LTI:

☐ BOP Test ☐ Crownamatic Check

Weather Information

Sky Condition:	Cloudy	**Visibility:**	10
Air Temperature:	27 degF	**Bar. Pressure:**	30.12
Wind Speed/Dir:	4 / SW	**Wind Gusts:**	4

Daily Drilling Report

Geothermal Resource Group, Inc.

Well ID: Forge 56-32 **Job ID: Original** **Well Name: 56-32**

Field: UTAHFORGE Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 31 **Report For 06-Mar-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**	08-Feb-21	**Daily Cost / Mud ($):**			---
Measured Depth (ft):	9145	**Last Casing:**	5.500 at 9,105	**Wellbore:**	Original Wellbore	**AFE No.**		**AFE ($)**	**Actual ($)**
Vertical Depth (ft):	9138	**Next Casing:**		**RKB Elevation (ft):**	30.40	---		---	---
Proposed TD (ft):	9000	**Last BOP Test:**	12-Feb-21	**Job Reference RKB (ft):**	28.50	---		---	---
Hole Made (ft) / Hrs:	0 / 0.0	**Next BOP Test:**		**Working Interest:**		**Totals:**		---	---
Average ROP (ft/hr):						**Job/Well Cost ($):**			---
Drilling Days (act./plan):	27/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	27/38	**Days On Location:**			31
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 168	**Service:**	4 / 48	**Other:**	0 / 0	**Total:**	20 / 240

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Cleaning out cement at 7,501'.

Planned Operations: Clean out cement to 9,030'.

Toolpusher: Steve Caldwell, Justin Bristol

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	2:30	2.50	9,145	3-28	Cleaned out cement from 1,709' to 2,666'.	
2:30	3:30	1.00	9,145	03-051	Swept hole.	
3:30	10:00	6.50	9,145	3-28	Cleaned out cement from 2,666' to 3,700'.	
10:00	10:30	0.50	9,145	SERV	Serviced Rig.	
10:30	0:00	13.50	9,145	3-28	Cleaned out cement from 3,700' to 6,238' at 2400 hours.	

Management Summary

Cleaned out cement from 1,709' to 6,238'.

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	16.30
FULL	9.625	0	0	3,494	3,488	INT1	12.250	36	J-55	16.00
LINER	5.500	0		9,105						

Mud Information

Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	% Solids	% Oil	% Water	% Sand	LGS	Cl	Ca	CaCl	Gels 10s	Gels 10m	Gels 30m	Temp In	Temp Out	Mud Loss
06-Mar-21 07:00 at Depth 9,145 ft Mud Pits																				
33.00	9			16	1	11	2.4	0	97.6	0.1		850	280					110	105	

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Bicarb - OTHER	1	---	Citric Acid - OTHER	3	---
Gel - OTHER	155	---	SinWeep/AltaVert - OTHER	1	---
xanthan gum - OTHER	10	---			

Bit/BHA/Workstring Information

BHA - No. 17 - BIT, MMTR, XO, 6 DC = 193.27

Rig Information

Equipment Problems:

Location Condition:

Transport:

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
2.875	295	10.4	G-105	OTHER					

Daily Drilling Report

Well ID: Forge 56-32 **Job ID: Original**
Field: UTAHFORGE

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 31 **Report For 06-Mar-21**

Safety Information

Meetings/Drills	Time	Description
Safety	60	Mouse Hole Connections

First Aid Treatments:	Medical Treatments:	Lost Time Incidents:	Days Since LTI:

☐ BOP Test ☐ Crownamatic Check

Weather Information

Sky Condition:	Clear	**Visibility:**	10
Air Temperature:	30 degF	**Bar. Pressure:**	29.85
Wind Speed/Dir:	16 / SSW	**Wind Gusts:**	50

Daily Drilling Report

Well ID: Forge 56-32 **Job ID: Original**
Field: UTAHFORGE

Geothermal Resource Group, Inc.

Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 32 **Report For 07-Mar-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**	08-Feb-21	**Daily Cost / Mud ($):**			---
Measured Depth (ft):	9145	**Last Casing:**	5.500 at 9,105	**Wellbore:**	Original Wellbore	**AFE No.**		**AFE ($)**	**Actual ($)**
Vertical Depth (ft):	9138	**Next Casing:**		**RKB Elevation (ft):**	30.40	---		---	---
Proposed TD (ft):	9000	**Last BOP Test:**	12-Feb-21	**Job Reference RKB (ft):**	28.50	---		---	---
Hole Made (ft) / Hrs:	0 / 0.0	**Next BOP Test:**		**Working Interest:**		**Totals:**		---	---
Average ROP (ft/hr):						**Job/Well Cost ($):**			---
Drilling Days (act./plan):	28/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	28/38	**Days On Location:**			32
Pers/Hrs: **Operator:**	2 / 24	**Contractor:**	14 / 168	**Service:**	4 / 48	**Other:**	0 / 0	**Total:**	20 / 240

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Displacing well with fresh water.

Planned Operations: Displace well bore with treated water and pull out of the hole laying down drill pipe and tools.

Toolpusher: Steve Caldwell, Justin Bristol

Wellsite Supervisors: Virgil Welch, Paul Stroud **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	9:00	9.00	9,145	3-28	Cleaned out cement from 6238' to 8072'.	
9:00	9:30	0.50	9,145	3-5-1	Circulated well bore clean.	
9:30	15:00	5.50	9,145	3-28	Cleaned out cement from 8072' to 9034'.	
15:00	16:00	1.00	9,145	3-5-1	Pumped sweep and circulated well bore clean.	
16:00	21:30	5.50	9,145	10-6-2	Pulled out of the hole laying down 4" drill collars and bit.	
21:30	0:00	2.50	9,145	10-6-1	Made up bit, casing scraper, bumper sub and ran in the hole scraping Liner.	

Management Summary

Cleaned out cement from 6,238' to 9,034' and circulated well bore clean. Pulled out of the well bore and laid down 4" drill collars, mud motor and bit. Made up bit, scraper and bumper sub. Ran in the hole scraping 5-1/2" casing.

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	16.30
FULL	9.625	0	0	3,494	3,488	INT1	12.250	36	J-55	16.00
LINER	5.500	0		9,105						

Mud Information

Dens.	Vis	PV	YP	Filt.	Cake	pH/ES	% Solids	% Oil	% Water	% Sand	LGS	Cl	Ca	CaCl	Gels 10s	Gels 10m	Gels 30m	Temp In	Temp Out	Mud Loss
07-Mar-21 05:00 at Depth 9,145 ft Mud Pits																				
8.60	36	13	12	14	1	10.5	2	0	98	0.1		850	320		4	8	12	123	133	

Mud Consumables

Item Description	Qty.	Cost	Item Description	Qty.	Cost
Citric Acid - OTHER	5	---	SAwdust - OTHER	1	---
TorkEase - OTHER	12	---	xanthan gum - OTHER	18	---

Bit/BHA/Workstring Information

No	Run	Make	Model	Diam	Depth In	This Run Dist	This Run Hrs	R.O.P. Avg	R.O.P. Max	WOB	RPM	Torque	Mud Wt	Pump Flow	Pump Press	J. Vel	P. Drp	HHP	JIF
16	1	REED	TK53	1,709.	1709	7,345	24.6	298.6	300.0	3	300	2	9	210	3000	37	10	1	34

Jets: 20 20 20 20 20 20 **Out:** 9034 **Grade:** **Cutter:** 0 / 0 **Dull:** NO / NO **Wear:** A **Brgs:** X **Gge:** 0 **Pull:** TD

BHA - No. 17 - BIT, MMTR, XO, 6 DC = 193.27

Rig Information

Equipment Problems:

Location Condition:

Transport:

Daily Drilling Report

Geothermal Resource Group, Inc.

Well ID: Forge 56-32 **Job ID: Original** **Well Name: 56-32**

Field: UTAHFORGE Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 32 **Report For 07-Mar-21**

Drill Pipe Inventory

DP Size	Joints	Weight	Grade	Thread	DP Size	Joints	Weight	Grade	Thread
2.875	295	10.4	G-105	OTHER					

Safety Information

Meetings/Drills	Time	Description
Safety	60	Laying down drill pipe.

First Aid Treatments: **Medical Treatments:** **Lost Time Incidents:** **Days Since LTI:**

☐ **BOP Test** ☐ **Crownamatic Check**

Weather Information

Sky Condition:	Clear	**Visibility:**	10
Air Temperature:	45 degF	**Bar. Pressure:**	29.93
Wind Speed/Dir:	10 / S	**Wind Gusts:**	50
Comments:	High winds today and tomorrow.		

Daily Drilling Report

Well ID: Forge 56-32
Field: UTAHFORGE

Geothermal Resource Group, Inc.
Well Name: 56-32
Sect: 32 Town: 26S Rng: 9W County: Beaver State: UT

Report No: 33 **Report For 08-Mar-21**

Operator:	University of Utah	**Rig:**	Frontier	**Spud Date:**	08-Feb-21	**Daily Cost / Mud ($):**			---
Measured Depth (ft):	9145	**Last Casing:**	5.500 at 9,105	**Wellbore:**	Original Wellbore	**AFE No.**		**AFE ($)**	**Actual ($)**
Vertical Depth (ft):	9138	**Next Casing:**		**RKB Elevation (ft):**	30.40	---		---	---
Proposed TD (ft):	9000	**Last BOP Test:**	12-Feb-21	**Job Reference RKB (ft):**	28.50	---		---	---
Hole Made (ft) / Hrs:	0 / 0.0	**Next BOP Test:**		**Working Interest:**		**Totals:**		---	---
Average ROP (ft/hr):						**Well Cost ($):**			---
Drilling Days (act./plan):	29/30	**Flat Days (act./plan):**	0/8	**Total Days (act./plan):**	29/38	**Days On Location:**			33
Pers/Hrs: **Operator:**	1 / 12	**Contractor:**	14 / 12	**Service:**	0 / 0	**Other:**	0 / 0	**Total:**	15 / 24

Safety Summary: No incidents or events reported. Conducted Safety Meeting.

Current Operations: Change valves and seats in pumps and replace 5" liners back to 6". Rig down water pump at 58-32 and take to connex. Inventory connex and lock, Rig released at 06:00 on March 9,2021, Pason released at 06:00 on March 9, 2021

Planned Operations: Rig has truck coming Thursday to remove top drive and lay over derrick

Toolpusher: Steve Caldwell, Justin Bristol

Wellsite Supervisors: Virgil Welch **Tel No.:** 7132807438

Operations Summary

From	To	Elapsed	End MD(ft	Code	Operations Description	Non-Prod
0:00	2:30	2.50	9,145	10-6-1	RIH scraping casing to 8,933'	
2:30	4:30	2.00	9,145	3-3	Wash and Ream from 8,933' to 9,034'	
4:30	5:00	0.50	9,145	3-5-1	Circulate hole clean	
5:00	6:00	1.00	9,145	3-5-1	Displace the mud in the hole with 200 bbl fresh water	
6:00	8:00	2.00	9,145	3-5-1	Displace the water in the hole with 266 bbl Biocide water	
8:00	16:00	8.00	9,145	10-342	POH laying down all 2-7/8" drill pipe	
16:00	16:30	0.50	9,145	10-344	Lay down BHA	
16:30	18:00	1.50	9,145	1-14	Remove flow line and cut casing at ground level, separate cross over spools, load out 3rd truck of rental tools and 4th truck w/ motors to Casper	
18:00	22:00	4.00	9,145	WELLHD	Weld on wellhead and install master valve. Weld on weldalet and install threaded valve	
22:00	0:00	2.00	9,145	3-97	Clean pits	

Management Summary

Circulate hole clean,
Displace the mud in the hole with 200 bbl fresh water,
Displace the water in the hole with 266 bbl Biocide water,
POH laying down all 2-7/8" drill pipe,
Lay down BHA, Remove flow line and cut casing at ground level, separate cross over spools, load out 3rd truck of rental tools and 4th truck w/ motors to Casper,
Weld on wellhead and install master valve.
Weld on wellhead and install threaded valve,
Clean pits

Casing/Tubular Information

Type	Size (ins)	Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Hole Section	OH Diam. (ins)	Nom. Wgt. (lbs)	Nominal Grade	LOT (lbs/gal)
FULL	20.000	30	30	129	129	COND				
FULL	13.375	0	0	382	382	SURF	17.500	55	J-55	16.30
FULL	9.625	0	0	3,494	3,488	INT1	12.250	36	J-55	16.00
LINER	5.500	0		9,105						

Rig Information

Equipment Problems:

Location Condition:

Transport:

Safety Information

Meetings/Drills	Time	Description
Safety	30	LDDP

First Aid Treatments: **Medical Treatments:** **Lost Time Incidents:** **Days Since LTI:**

☐ **BOP Test** ☐ **Crownamatic Check**

Weather Information

Sky Condition:	clear	**Visibility:**	10
Air Temperature:	46 degF	**Bar. Pressure:**	29.91
Wind Speed/Dir:	21 / S	**Wind Gusts:**	

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Name	Org.	Sandia Email Address
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Angel Nieto	angel.nieto@ee.doe.gov	DOE/EERE/GTO
Kevin Jones	kevin.jones1@ee.doe.gov	DOE/EERE/GTO
Joseph Moore	jmoore@egi.utah.edu	Energy & Geoscience Institute
John McLennan	jmclennan@egi.utah.edu	EGI/University of Utah
Fred Dupriest	fred.dupriest@tamu.edu	Texas A&M University
Samuel F. Noynaert	noynaert@tamu.edu	Texas A&M University
Tom Roberts	Tom.Roberts@nov.com	NOV
Aaron Schen	Aaron.Schen@nov.com	NOV
Matt Stevenson	Matt.Stevenson@nov.com	NOV
Derek Nelson	DNelson4@slb.com	Smith International
Jordan Self	jself@ulterra.com	Ulterra
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