



COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
OFFICE OF OIL AND GAS MANAGEMENT

DEP USE ONLY	
Auth No. 1564369	APS No.# 1128607
Site No. 789933	PF No. 880726
Client No. 141142	SF No. 1436284

RECEIVED  
3/31/2026

ALT SITE ID: WLPAD - BIRD RUN  
APPLICATION FOR INACTIVE WELL STATUS

Well Operator RangeResources-Appalachia, LLC		DEP Client ID No. 141142	Well Permit or Registration No. 37-125-29188	
Address 3000 Town Center Blvd.			Well Farm Name Bird Run 10938	Well No. 4H
City Canonsburg		State PA	Zip Code 15317	County Washington
Telephone No. 724/743-6700		Fax No. 724/743-6790	Bond Instrument No. 6855	Municipality Chartiers Twp
Is this an application for annual extension of inactive status? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
Check here if this application is being submitted for conditional inactive status in association with longwall mining: <input type="checkbox"/>				

**Condition of the Well**  
Describe in detail how the condition of the well satisfies the criteria for approval of inactive status. See 25 Pa. Code §§ 78/78a.102(i), (2)(i) or (ii) and (3). Use additional sheets if necessary. If available, attach well records, driller's logs, and other information describing well casing, cement, equipment, and any other pertinent information. Note that if this application is being submitted in conformance with DEP Technical Guidance Document 800-0810-004 *Guidelines for Chain Pillar Development and Longwall Mining Adjacent to Unconventional Wells*, the Well Record/Completion Report may be referenced for all well construction information, and all tubing and annular pressures should be at 0 prior to adjacent longwall mining encroaching within 1,500 feet of the well location. Finally, all annuli should be open to the atmosphere and the inactivation procedure may be referenced under the section titled "Other information about the well's condition."

**Well Type:**  Gas  Oil  Combination Oil & Gas  Injection  Storage  Disposal

Casing Diameters: 18.625"	Casing Lengths: 202'	Type and amount of cement (sacks) used for surface casing: Class L, 460 (sacks)
13.375"	282'	Tubing or Production Casing Pressure (current): 0 (psi)
9.625"	1654'	If an oil well, state the depth to fluid in the surface casing:
Tubing or production casing diameter: 5.5"	Tubing or production casing length: 22265	Annulus Pressure (current - between tubing or production casing and surface casing): 0 (psi)
Are all annuli open to atmosphere? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Other information about the well's condition:  
N/A

**Future Use of the Well**  
Describe a viable plan in accordance with 25 Pa. Code §78/78a.102(4) explaining the intended use of the well within a reasonable time. Provide the information requested below and any other information necessary for DEP to make a determination on inactive status for this well. Note that if this application is being submitted in conformance with DEP Technical Guidance Document 800-0810-004 *Guidelines for Chain Pillar Development and Longwall Mining Adjacent to Unconventional Wells*, the following text may be entered under the section regarding the future plan for the well: "Return well to production subsequent to final panel extraction when mining is at least 1,500 feet beyond well in chain pillar, as per re-entry procedure and TGD."

Provide certification that one of the following applies (check one):  
 Significant reserves remain in place and I plan to return the well to production.  
Provide estimate of reserves: MMcf: Bbls:  
The well will be used for:  Disposal  Storage  Observation  Injection - Recovery  Other (describe)  
This well will be returned to use in: Month: August Year: 2026

State your plan for future use of the well.  
Range Resources-Appalachia, LLC certifies this well is of future utility. The well is drilled to TD and is awaiting completions operations currently scheduled for June 2026.


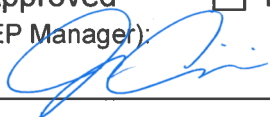
<b>Conditional Inactive Status Checklist</b>	For unconventional wells drilled in anticipated chain pillar locations that are being temporarily inactivated to accommodate planned, adjacent longwall mining, please provide the items included in the checklist below in addition to this application. More specific information about these items is detailed in DEP Technical Guidance Document 800-0810-004 <i>Guidelines for Chain Pillar Development and Longwall Mining Adjacent to Unconventional Wells</i> .
--	---

Please include the following items with the inactive status application:

- Temporary Well Inactivation Procedure  
  Temporary Inactivation Well Schematic  
  General Specifications for Cements/Gels  
 Current Well Record and Completion Report  
  Well Location Plat  
  Electrical/Mechanical Well Logs  
 Graphical Production History Summary  
  Well Re-entry Procedure  
  Post-mining Well Long-term Monitoring Procedure

Provide additional details, if necessary.

N/A

Signature of Applicant (Well Operator)	DEP USE ONLY
Signature: <u></u> Date: <u>3-31-2026</u> Print or type signer's name and title: <u>JEREMY MATINKO VP-ENV. IOMP.</u>	<input checked="" type="checkbox"/> Approved <input type="checkbox"/> Denied      Date: _____ by (DEP Manager): <u></u> <u>5/5/2026</u>



COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
OFFICE OF OIL AND GAS MANAGEMENT

DEP USE ONLY	
Site ID	Client Id
Primary Facility Id	Sub Facility Id

**Well Record**  
**(Unconventional Operators Only)**

**WELL INFORMATION**

Well Operator Range Resources - Appalachia, LLC	DEP ID# 141142	US Well No. (API No.) 37-125-29188-00-00	Farm Name BIRD RUN 10938	Well # 4H
Address 3000 Town Center Blvd		Latitude (DD) 40.243428 Longitude (DD) -80.235099	Project Number	Serial #
City Canonsburg	State PA	Zip 15317-5839	Municipality Chartiers	County Washington
Phone 724-743-6700	email jhinson@rangeresources.com	Borrow Pit	USGS 7.5 min. quadrangle map Washington East	Section 1

Check the appropriate Submission:  Original Well Record  Amended Well Record

Well Type <input checked="" type="checkbox"/> Gas	Wellbore Conditioning: See Attached
Well Orientation <input type="checkbox"/> Vertical <input checked="" type="checkbox"/> Deviated from Vertical (Top & Side views & Deviation Survey must be attached)	
Drill Method(s) <input checked="" type="checkbox"/> Rotary - Air 6148' <input checked="" type="checkbox"/> Rotary - Mud 22279' <input type="checkbox"/> Cable Tool <input type="checkbox"/> Other	
Drilling Started 02/06/2025	Surface Elev. 1261 ft.
Drilling Complete 04/27/2025	True Vertical Depth 6727 ft.
Date Well Completed 05/01/2025	Total Measured Depth 22279 ft.
	GW Depth - None observed
	Depth of DFGW - None observed
	DFGW decided by: 6

**CEMENT**

Cement returned on surface casing?  Yes  No  
 Cement returned on coal protective casing?  Yes  No  
 Cement returned on intermediate casing?  Yes  No

If No, provide depth to top of cement and method used to determine:  NA

Casing String	Type/Class of Cement (Lead/Tail)	Slurry Temp F°	Amount of Cement (sacks) (Lead/Tail/Total)	WOC hrs	Wt ppg	Yield #ft <sup>3</sup> /sacks	Gas Migration Controls Used
Conductor	Portland	-	108 / 0 / 108	24			What controls were used if any (additives/ hardware. Specify type and depth applicable). See Attached - page 6
Surface	Class L	73°	460 / 0 / 460	8	15.6	1.15	
Coal Protective	Class L	67°	290 / 0 / 290	8	15.7	1.24	
Intermediate	Class L	63°	605 / 0 / 605	8	15.7	1.23	
Production	Class A	78°	0 / 3625 / 3625	8	15.0	1.29	
If additional strings attach form(s)			Total: 5088				

**CASING AND TUBING**

Hole Size	Pipe Size	Wt. #/ft.	Grade Casing / Tubing Type	Thread / Weld - New/Used	Amount in Well (ft.)	CO	R	Hardware - Baskets / Packer / Centralizers (Total/String)	Date Run	
								Type	Size	Depth
32"	26"	85.68#	Line Pipe	W/N	41	US	Y			02/06/2025
24"	18.625"	87.5#	J-55	T (BTC) - N	202	UK	Y	See Attached		03/12/2025
17.5"	13.375"	54.5#	J-55	T (BTC) - N	282	KR	Y	See Attached		03/12/2025
12.25"	9.625"	40.0#	J-55	T (LTC) - N	1654	CA	Y	See Attached		03/14/2025
8.75" & 8.625" & 8.5"	5.5"	20.0#	HP P-110	T (GBCD) - N	22265	US	Y	See Attached		05/01/2025

**PLUG-BACK/WELLBORE ALTERATION**

Fill Material & Plugs	Depth		Date	Casing & Tubing		
	From	To		Size	Pulled	Left

**LOG OF FORMATIONS**

US Well No. (API No.): 37-125-29188-00-00

(If you will need more space than this page, please photocopy the blank form before filling it in.)

Formation Name or Lithology	Top (feet)	Bottom (feet)	Gas at (feet)	Oil at (feet)	Water at (fresh / brine; ft.)	Source of Data
Fill	0	49				Mudlog
Silt/Lime/Sand	49	109				Mudlog
Silt/Sand	109	234				Mudlog
Pittsburgh Coal (open mine)	234	240				Mudlog
Siltstone/Shale	240	419				Mudlog
Murphy Sand	419	539				Mudlog
Red Rock	539	540				Mudlog
Siltstone/Shale	540	602				Mudlog
Bakerstown	602	731				Mudlog
Big Dunkard	731	769				Mudlog
Siltstone/Shale	769	804				Mudlog
Upper Freeport	804	805				Mudlog
Silt/Sand	805	871				Mudlog
Lower Freeport	871	872				Mudlog
Silt/Sand	872	911				Mudlog
1st Gas Sand	911	939				Mudlog
Silt/Sand	939	982				Mudlog
Middle Kittanning	982	983				Mudlog
Silt/Sand	983	1023				Mudlog
Lower Kittanning	1023	1024				Mudlog
Silt/Sand	1024	1031				Mudlog
1st Salt Sand	1031	1089	1080			Mudlog
Silt/Sand	1089	1101				Mudlog
Clarion	1101	1102				Mudlog
Silt/Sand	1102	1175				Mudlog
2nd Salt Sand	1175	1199				Mudlog
Silt/Sand/Lime	1199	1339				Mudlog


Continued on next page

If no show of oil, gas or water, explain why: No show of water on Mudlog or MWD log

**WELL SERVICE COMPANIES** (Provide the name, address, and telephone number of all well service companies involved.)

Casing Source	Cementing Company	Hardware Supplier	Logging Company
See Attachment	Name See Attachment	See Attachment	See Attachment
	Address		
	City - State - Zip		
	Phone		

I do hereby certify to the best of my knowledge, information and belief that the well identified on this Well Record has been properly cased and cemented in accordance with the requirements of 25 Pa. Code Chapter 78a and any conditions contained in the permit for this well. In addition, I do hereby certify that any casing which is attached to a blow-out preventer with a pressure rating greater than 3,000 psi has passed a pressure test in accordance with 25 Pa. Code §78a.84(f). I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Driller		Well Operator's Signature		DEP USE ONLY		
Name See Attachment	Rig	 Printed Name / Title: Jon Hinson / Sr. Drilling Engineer		Reviewed by:		
Address				Comments:		
City - State- Zip				Date: 05/27/2025		
Phone						

**LOG OF FORMATIONS**

US Well No. (API No.): 37-125-29188-00-00

*(If you will need more space than this page, please photocopy the blank form before filling it in.)*

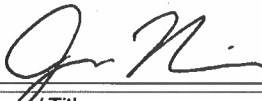
Formation Name or Lithology	Top (feet)	Bottom (feet)	Gas at (feet)	Oil at (feet)	Water at (fresh / brine; ft.)	Source of Data
Big Lime	1339	1380				Mudlog
Big Injun	1380	1544				Mudlog
Silt	1544	1609				Mudlog
Squaw Sand	1609	1671				Mudlog
Silt/Sand	1671	1853				Mudlog
Murrysville	1853	1912				Mudlog
Silt/Sand	1912	2018				Mudlog
Gantz	2018	2041				Mudlog
100 Ft Sand	2041	2089				Mudlog
Sand/Silt	2089	2174				Mudlog
Nineveh	2174	2232				Mudlog
Gordon Stray	2232	2245				Mudlog
Gordon	2245	2283				Mudlog
Upper Fifth Sand	2283	2299				Mudlog
Silt/Sand	2299	2329				Mudlog
Lower Fifth Sand	2329	2396				Mudlog
Bayard	2396	2419				Mudlog
Silt/Sand	2419	2426				Mudlog
Bayard Stray	2426	2444				Mudlog
Silt/Sand	2444	2872				Mudlog
Lower Warren	2872	2974				Mudlog
Siltstone/Shale	2974	3170				Mudlog
Upper Speechley	3170	3272				Mudlog
Silt/Shale	3272	4594				Mudlog
5th Elk	4594	4599				Mudlog
Silt/Sand/Shale	4599	4932				Mudlog
Lower Huron	4932	5199				Mudlog

If no show of oil, gas or water, explain why: No show of water on Mudlog or MWD log

**WELL SERVICE COMPANIES** (Provide the name, address, and telephone number of all well service companies involved.)

Casing Source	Cementing Company	Hardware Supplier	Logging Company
See Attachment	Name See Attachment	See Attachment	See Attachment
	Address		
	City - State - Zip		
	Phone		

*I do hereby certify to the best of my knowledge, information and belief that the well identified on this Well Record has been properly cased and cemented in accordance with the requirements of 25 Pa. Code Chapter 78a and any conditions contained in the permit for this well. In addition, I do hereby certify that any casing which is attached to a blow-out preventer with a pressure rating greater than 3,000 psi has passed a pressure test in accordance with 25 Pa. Code §78a.84(f). I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.*

Driller		Well Operator's Signature		DEP USE ONLY	
Name See Attachment	Rig	 Printed Name / Title: Jon Hinson / Sr. Drilling Engineer      Date: 05/27/2025		Reviewed by:	
Address				Comments:	
City - State - Zip					
Phone					

**LOG OF FORMATIONS**

US Well No. (API No.): 37-125-29188-00-00

*(If you will need more space than this page, please photocopy the blank form before filling it in.)*


Formation Name or Lithology	Top (feet)	Bottom (feet)	Gas at (feet)	Oil at (feet)	Water at (fresh / brine; ft.)	Source of Data
Silt/Shale	5199	6036				Mudlog
Rhinestreet	6036	6194	6036			Mudlog
Cashaqua	6194	6315				Mudlog
Middlesex	6315	6374	6315			Mudlog
Genesee	6374	6445				MWD
Burket	6445	6479	6445			MWD
Tully	6479	6540				MWD
Mahantango	6540	6636	6540			MWD
Marcellus	6636	22279	6636			MWD
Driller's TD		22279				Driller's Log

If no show of oil, gas or water, explain why: No show of water on Mudlog or MWD log

**WELL SERVICE COMPANIES** (Provide the name, address, and telephone number of all well service companies involved.)

Casing Source	Cementing Company	Hardware Supplier	Logging Company
See Attachment	Name See Attachment	See Attachment	See Attachment
	Address		
	City - State - Zip		
	Phone		

*I do hereby certify to the best of my knowledge, information and belief that the well identified on this Well Record has been properly cased and cemented in accordance with the requirements of 25 Pa. Code Chapter 78a and any conditions contained in the permit for this well. In addition, I do hereby certify that any casing which is attached to a blow-out preventer with a pressure rating greater than 3,000 psi has passed a pressure test in accordance with 25 Pa. Code §78a.84(f). I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.*

Driller		Well Operator's Signature		DEP USE ONLY	
Name See Attachment	Rig	 Printed Name / Title: Jon Hinson / Sr. Drilling Engineer		Reviewed by:	
Address				Comments:	
City - State- Zip					
Phone					
		Date:	05/27/2025		



**API# 37-125-29188-00-00**

## Well Service Companies

### CASING SOURCE:

B&L Pipeco  
20465 State Highway 249, Suite 200  
Houston, TX 77070  
1-800-927-4732  
*Surface, Coal Protective, Intermediate, and Production*

### CEMENTING COMPANY:

NexTier Completion Solutions  
3990 Rogerdale Road  
Houston, TX 77042  
713-325-6000  
*Surface, Coal Protective, Intermediate*

Schlumberger Technology Corporation  
PO Box 732149  
Dallas, TX 75373-2149  
NAMremittance@slb.com  
*Production*

### DRILLER:

Falcon Drilling – Falcon Rig 26  
102 Broadway Street Suite 300  
Carnegie, PA 15106  
740-349-8131  
*From 0' to 6,148'*

Patterson UTI Drilling Co. LLC - 876  
10713 W. Sam Houston Parkway N, Suite 800  
Houston, Texas 77064  
Fax: 281-766-7176  
*From 6,148' to 22,279'*

### LOGGING COMPANY:

Schlumberger Technology Corporation  
PO Box 732149  
Dallas, TX 75373-2149  
NAMremittance@slb.com

Total Directional Services, LLC  
PO Box 831  
Windsor, CO 80550  
970-686-8893

Baker Hughes  
PO Box 30105  
Dallas, TX 75303-1057  
724-743-9212

Computerized Mudlogging Service, LLC  
324 Deer Creek Drive  
Struthers, OH 44471  
330-397-5710

Edge Finance, LLC  
33502 TX-249  
Pinehurst, TX 77362  
713-504-1094



API# 37-125-29188-00-00

## Hardware Supplier Company List

### **CENTRALIZERS:**

Summit Casing Equipment  
6575 Corporation Parkway  
Fort Worth, TX 76126  
(877) 860-0969  
www.summitcasing.com  
*Surface, Coal Protective, Intermediate, Production*

### **CENTRALIZER TYPES:**

18-5/8" x 22" – Welded Steel Bow Spring  
13-3/8" x 17 1/2" – Welded Steel Bow Spring  
9-5/8" x 12 1/4" – Welded Steel Bow Spring  
5 1/2" x 8.0" – Solid Body Composite

### **TOE SLEEVES:**

RSI CT HPHT Toe/Frac Sleeve  
Halliburton  
1000 Noble Energy Drive, Suite 400  
Canonsburg, PA 15317-5817  
724-743-8188  
[halliburton.com](http://halliburton.com)

### **FLOAT SHOE/LANDING COLLAR:**

Hybrid Double Valve Float Shoe & Landing Collar  
Innovex Downhole Solutions  
1848 Old Route 33  
Weston, WV 26452  
304-841-0821  
www.InnovexDownhole.com

### **FLOTATION DEVICE:**

NCS AirLock Flotation Sub  
NCS Multistage  
19450 State Highway 249 Suite 200  
Houston, TX 77070  
281-453-2222



**API# 37-125-29188-00-00**

**DFGW decided by:** 6 – Geologist’s determination – none observed

**Wellbore Conditioning Attachment**

**Surface:**

Pump 80 bbl of fresh water to gain circulation. Pumped 25 bbl gel with 40# Baroseal.

**Coal Protective:**

Pump 68 bbl of fresh water to gain circulation, 25 bbl of Gel Spacer with 40# Baroseal.

**Intermediate:**

Pump 136 bbl of fresh water, 25 bbl Gel bentonite with Baroseal.

**Production:**

Circulate 2 bottoms up at 8.0 bpm. *Spacer details in Cement and Gas Migration Controls Attachment below.*

**Cement and Gas Migration Controls Attachment**

**Surface:**

Mix and pump 94 bbl (460 sacks) of Class L cement. Displaced cement with 45 bbl of fresh water. Circulated 21 bbl of cement to surface. Water temperature 61°F, slurry temperature 73°F. Float held with 0.5 bbl flow back to truck.

**Coal Protective:**

Mix and pump 64 bbl (290 sacks) of Class L cement. Displace with 38 bbl of fresh water. Circulated 20 bbl of cement to surface. Mix water temperature 56°F, slurry temperature 67°F, pH 7.

**Intermediate:**

Mix and pump 132 bbl (605 sacks) of Class L gas block cement. Drop plug and displace with 119 bbl of fresh water. Plug landed at 750 psi, bumped to 1,400 psi. Released pressure, floats held with 1 bbl back to truck. 30 bbl of cement returned to surface. Water temperature 54°F, slurry temperature 63°F, pH 7.

**Production:**

Schlumberger pumped 100 bbl of 13.5 ppg MudPush Express with Surfactant, 154 bbl of 13.5 ppg MudPush Express without surfactant, and 833 bbl 15.0 ppg Tail Cement 3,625 sacks. Displaced plug with 495 bbl of fresh water. Landed plug at 4 bpm and 2,700 psi, bumped pressure to 3,317 psi. Held pressure for 5 minutes, checked floats, released pressure, 6 bbl returned to truck. Floats held. Maintained circulation throughout job, 95 bbl spacer returned to surface. Mix water temperature 68° F, slurry temperature 78° F.



API# 37-125-29188-00-00

**Casing and Tubing Attachment: Hardware**

**Surface:**

Run 5 joints of 18 5/8" 87.5# J-55 BTC casing set at 202'. Top of float shoe set at 199'. Ran 5 bow spring centralizers every joint from 158' to 26'.

**Coal Protective:**

Run 7 full joints 13 3/8" 54.5# J-55 BTC casing set at 282'. Top of float shoe set at 279'. Cement baskets set at 230' and 225'. Ran 6 bow spring centralizers every joint from 237' to 27'.

**Intermediate:**

Run 39 joints of 9 5/8" 40.0# J-55 LTC casing set at 1,654'. Top of float shoe set at 1,651'. Float collar set at 1,564'. Ran 20 bow spring centralizers every other joint from 1,609 to 26'.

**Production:**

Run 502 joints of 5 1/2" 20.0# HP P-110 GBCD casing set at 22,265'. Top of float shoe set at 22,261'. (2) centralized pup joints set at 22,230 and 22,194'. Toe sleeves set at 22,226' and 22,190'. Marker joints set at 20,274', and 6,143. Floatation device set at 7,257'. Ran 396 – 8.0" Solid Body Composite centralizer every full-length joint from 22,146' to 4,694'. Ran a total of 398 centralizers.





# Actual Wellpath Report

BIRD RUN 10938 4H AWP Proj: 22305'  
Page 1 of 12



## REFERENCE WELLPATH IDENTIFICATION

Operator	RANGE RESOURCES APPALACHIA, LLC	Well	BIRD RUN 10938 4H
Field	Washington	API	37-125-29188-0000
Facility	BIRD RUN 10938 Pad	Wellbore	BIRD RUN 10938 4H AWB
Slot	Slot #04		

## REPORT SETUP INFORMATION

Projection System	NAD83 / Lambert Pennsylvania SP, Southern Zone (3702), US feet	Software System	WellA rchitect® 6.0
North Reference	Grid	User	Edsaryar
Scale	0.999966	Report Generated	4/29/2025 at 3:27:30 PM
Convergence at slot	1.61° West	Database	WA_MPL_EASTERNUS_Defn

## WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	-1.90	-40.19	1274860.84	341294.88	40°14'36.3400"N	80°14'6.3574"W
Facility Reference Pt			1274901.03	341296.78	40°14'36.3700"N	80°14'5.8400"W
Field Reference Pt			0.00	0.00	39°07'14.8609"N	84°41'37.2884"W

## WELLPATH DATUM

Calculation method	Minimum curvature	Patterson 876 (RKB) to Facility Vertical Datum	1287.00ft
Horizontal Reference Pt	Slot	Patterson 876 (RKB) to Mean Sea Level	1287.00ft
Vertical Reference Pt	Patterson 876 (RKB)	Patterson 876 (RKB) to Ground Level at Slot (Slot #04)	26.00ft
MD Reference Pt	Patterson 876 (RKB)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	322.01°



# Actual Wellpath Report

BIRD RUN 10938 4H AWP Proj: 22305'  
Page 2 of 12



## REFERENCE WELLPATH IDENTIFICATION

Operator	RANGE RESOURCES APPALACHIA, LLC	Well	BIRD RUN 10938 4H
Field	Washington	API	37-125-29188-0000
Facility	BIRD RUN 10938 Pad	Wellbore	BIRD RUN 10938 4H AWB
Slot	Slot #04		

## WELLPATH DATA (247 stations) † = interpolated, ‡ = extrapolated station

MD (ft)	Inclination (°)	Azimuth (°)	TVD (ft)	Vert Sect (ft)	North (ft)	East (ft)	Grid East (ft)	Grid North (ft)	Latitude	Longitude	Closure Dist. (ft)	Closure Dir (°)	DLS (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00†	0.000	130.100	0.00	0.00	0.00	0.00	1274860.84	341294.88	40°14'36.3400"N	80°14'6.3574"W	0.00	0.000	0.00	0.00	0.00
26.00	0.000	130.100	26.00	0.00	0.00	0.00	1274860.84	341294.88	40°14'36.3400"N	80°14'6.3574"W	0.00	0.000	0.00	0.00	0.00
65.00	0.450	130.100	65.00	-0.15	-0.10	0.12	1274860.96	341294.78	40°14'36.3391"N	80°14'6.3559"W	0.15	130.100	1.15	1.15	0.00
115.00	0.420	154.670	115.00	-0.52	-0.39	0.35	1274861.19	341294.49	40°14'36.3363"N	80°14'6.3528"W	0.52	138.498	0.37	-0.06	49.14
165.00	0.540	155.120	165.00	-0.93	-0.77	0.52	1274861.36	341294.11	40°14'36.3326"N	80°14'6.3504"W	0.93	145.806	0.24	0.24	0.90
215.00	0.530	160.110	214.99	-1.38	-1.20	0.70	1274861.54	341293.68	40°14'36.3284"N	80°14'6.3479"W	1.39	149.733	0.10	-0.02	9.98
252.00	0.500	170.060	251.99	-1.68	-1.52	0.79	1274861.63	341293.36	40°14'36.3252"N	80°14'6.3467"W	1.71	152.641	0.25	-0.08	26.89
324.00	0.480	178.750	323.99	-2.27	-2.22	0.86	1274861.70	341292.66	40°14'36.3184"N	80°14'6.3456"W	2.38	158.880	0.09	-0.02	10.60
432.00	0.690	173.960	421.99	-3.02	-3.11	0.92	1274861.76	341291.77	40°14'36.3095"N	80°14'6.3444"W	3.25	163.530	0.24	0.24	-5.44
510.00	0.710	168.290	509.98	-3.96	-4.17	1.09	1274861.93	341290.71	40°14'36.2991"N	80°14'6.3419"W	4.31	165.406	0.08	0.02	-6.44
598.00	0.740	190.910	597.97	-4.82	-5.27	1.09	1274861.93	341289.61	40°14'36.2883"N	80°14'6.3414"W	5.38	168.307	0.32	0.03	-23.70
686.00	0.700	178.870	685.96	-5.62	-6.36	0.99	1274861.83	341288.52	40°14'36.2775"N	80°14'6.3423"W	6.44	171.129	0.18	-0.05	15.68
775.00	0.680	172.000	774.96	-6.52	-7.43	1.08	1274861.92	341287.45	40°14'36.2670"N	80°14'6.3408"W	7.50	171.749	0.10	-0.02	-7.72
863.00	0.870	170.230	862.95	-7.56	-8.60	1.26	1274862.10	341286.28	40°14'36.2554"N	80°14'6.3380"W	8.69	171.648	0.22	0.22	-2.01
951.00	0.860	170.470	950.94	-8.73	-9.91	1.49	1274862.33	341284.97	40°14'36.2425"N	80°14'6.3347"W	10.02	171.475	0.01	-0.01	0.27
1039.00	0.700	180.820	1038.93	-9.73	-11.10	1.59	1274862.44	341283.78	40°14'36.2308"N	80°14'6.3329"W	11.21	171.862	0.24	-0.18	11.76
1127.00	0.690	177.840	1126.93	-10.58	-12.17	1.60	1274862.44	341282.71	40°14'36.2203"N	80°14'6.3323"W	12.27	172.502	0.05	-0.01	-3.61
1214.00	0.510	151.520	1213.92	-11.38	-13.03	1.81	1274862.65	341281.85	40°14'36.2118"N	80°14'6.3294"W	13.16	172.103	0.37	-0.21	-30.02
1302.00	1.680	3.240	1301.91	-10.80	-12.09	2.07	1274862.91	341282.79	40°14'36.2212"N	80°14'6.3264"W	12.26	170.295	2.42	1.33	-168.50
1390.00	2.620	7.960	1389.85	-8.43	-8.81	2.42	1274863.26	341286.07	40°14'36.2537"N	80°14'6.3230"W	9.13	164.644	1.09	1.07	5.36
1479.00	2.170	4.480	1478.77	-5.77	-5.11	2.83	1274863.67	341289.77	40°14'36.2903"N	80°14'6.3190"W	5.85	151.021	0.53	-0.51	-3.91
1567.00	1.490	344.360	1566.73	-3.49	-2.35	2.65	1274863.49	341292.53	40°14'36.3175"N	80°14'6.3223"W	3.55	131.537	1.05	-0.77	-22.86
1627.00	1.760	311.420	1626.70	-1.86	-0.99	1.75	1274862.59	341293.89	40°14'36.3307"N	80°14'6.3345"W	2.01	119.466	1.59	0.45	-54.90
1721.00	2.170	289.650	1720.65	1.06	0.56	-1.01	1274862.83	341295.44	40°14'36.3453"N	80°14'6.3706"W	1.15	299.247	0.90	0.44	-23.16
1809.00	1.770	288.250	1808.60	3.60	1.55	-3.87	1274866.97	341296.43	40°14'36.3543"N	80°14'6.4078"W	4.16	291.838	0.46	-0.45	-1.59
1897.00	0.430	204.690	1896.58	4.58	1.67	-5.29	1274865.55	341296.55	40°14'36.3551"N	80°14'6.4263"W	5.55	287.553	2.02	-1.52	-94.95
1985.00	0.450	229.620	1984.58	4.41	1.15	-5.70	1274865.14	341296.03	40°14'36.3498"N	80°14'6.4312"W	5.81	281.423	0.22	0.02	28.33
2073.00	0.330	215.020	2072.58	4.32	0.72	-6.10	1274864.74	341295.60	40°14'36.3454"N	80°14'6.4364"W	6.15	276.721	0.18	-0.14	-16.59
2161.00	0.340	237.430	2160.57	4.27	0.37	-6.47	1274864.37	341295.25	40°14'36.3419"N	80°14'6.4409"W	6.48	273.284	0.15	0.01	25.47
2249.00	0.290	249.280	2248.57	4.37	0.15	-6.90	1274863.94	341295.03	40°14'36.3396"N	80°14'6.4464"W	6.90	271.262	0.09	-0.06	13.47



# Actual Wellpath Report

BIRD RUN 10938 4H AWP Proj: 22305'  
Page 3 of 12



## REFERENCE WELLPATH IDENTIFICATION

Operator	RANGE RESOURCES APPALACHIA, LLC	Well	BIRD RUN 10938 4H
Field	Washington	API	37-125-29188-0000
Facility	BIRD RUN 10938 Pad	Wellbore	BIRD RUN 10938 4H AWB
Slot	Slot #04		

## WELLPATH DATA (247 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
2338.00	0.320	245.230	2337.57	4.49	-0.03	-7.33	1274853.51	341294.85	40°14'36.3377"N	80°14'6.4519"W	7.33	269.751	0.04	0.03	-4.55
2416.00	0.280	227.860	2415.57	4.53	-0.25	-7.67	1274853.17	341294.63	40°14'36.3354"N	80°14'6.4562"W	7.68	268.126	0.13	-0.05	-22.27
2505.00	0.210	207.100	2504.57	4.44	-0.54	-7.91	1274852.93	341294.34	40°14'36.3325"N	80°14'6.4592"W	7.93	266.079	0.13	-0.08	-23.33
2593.00	0.240	179.530	2592.57	4.23	-0.87	-7.98	1274852.86	341294.01	40°14'36.3292"N	80°14'6.4600"W	8.03	263.779	0.13	0.03	-31.33
2681.00	0.270	187.980	2680.57	3.94	-1.26	-8.01	1274852.83	341293.62	40°14'36.3254"N	80°14'6.4602"W	8.11	261.061	0.05	0.03	9.60
2769.00	0.260	174.170	2768.57	3.62	-1.66	-8.02	1274852.82	341293.22	40°14'36.3214"N	80°14'6.4601"W	8.19	258.277	0.07	-0.01	-15.69
2858.00	0.370	129.160	2857.57	3.17	-2.05	-7.77	1274853.07	341292.83	40°14'36.3177"N	80°14'6.4569"W	8.04	255.254	0.29	0.12	-50.57
2946.00	0.460	123.370	2945.56	2.56	-2.42	-7.26	1274853.58	341292.46	40°14'36.3141"N	80°14'6.4501"W	7.65	251.563	0.11	0.10	-6.58
3034.00	0.580	107.730	3033.56	1.86	-2.75	-6.54	1274854.30	341292.13	40°14'36.3110"N	80°14'6.4407"W	7.09	247.193	0.21	0.14	-17.77
3122.00	0.630	96.050	3121.56	1.15	-2.94	-5.63	1274855.21	341291.94	40°14'36.3095"N	80°14'6.4290"W	6.35	242.470	0.15	0.06	-13.27
3210.00	0.770	98.960	3209.55	0.38	-3.08	-4.57	1274856.27	341291.80	40°14'36.3083"N	80°14'6.4152"W	5.51	236.017	0.16	0.16	3.31
3298.00	0.620	101.280	3297.54	-0.41	-3.26	-3.52	1274857.32	341291.62	40°14'36.3068"N	80°14'6.4016"W	4.80	227.134	0.17	-0.17	2.64
3386.00	0.480	72.910	3385.54	-0.90	-3.25	-2.70	1274858.14	341291.63	40°14'36.3072"N	80°14'6.3910"W	4.22	219.703	0.34	-0.16	-32.24
3474.00	0.460	69.770	3473.54	-1.14	-3.02	-2.01	1274858.83	341291.86	40°14'36.3096"N	80°14'6.3823"W	3.63	213.711	0.04	-0.02	-3.57
3562.00	0.460	65.370	3561.53	-1.33	-2.75	-1.36	1274859.48	341292.13	40°14'36.3125"N	80°14'6.3740"W	3.07	206.346	0.04	0.00	-5.00
3650.00	0.540	59.630	3649.53	-1.47	-2.39	-0.68	1274860.16	341292.49	40°14'36.3162"N	80°14'6.3653"W	2.49	195.926	0.11	0.09	-6.52
3738.00	0.610	60.860	3737.53	-1.59	-1.95	0.08	1274860.92	341292.93	40°14'36.3207"N	80°14'6.3556"W	1.96	177.534	0.08	0.08	1.40
3827.00	0.460	68.080	3826.52	-1.76	-1.59	0.83	1274861.67	341293.29	40°14'36.3245"N	80°14'6.3461"W	1.79	152.463	0.18	-0.17	8.11
3915.00	0.550	60.110	3914.52	-1.92	-1.25	1.52	1274862.36	341293.63	40°14'36.3281"N	80°14'6.3373"W	1.97	129.337	0.13	0.10	-9.06
3993.00	0.560	49.970	3992.51	-1.96	-0.82	2.14	1274862.98	341294.06	40°14'36.3326"N	80°14'6.3295"W	2.29	110.892	0.13	0.01	-13.00
4082.00	0.450	52.000	4081.51	-1.95	-0.32	2.75	1274863.59	341294.56	40°14'36.3376"N	80°14'6.3219"W	2.77	96.679	0.13	-0.12	2.28
4170.00	0.540	47.250	4169.51	-1.91	0.17	3.33	1274864.16	341295.05	40°14'36.3427"N	80°14'6.3146"W	3.33	87.032	0.11	0.10	-5.40
4258.00	0.480	23.260	4257.50	-1.70	0.79	3.78	1274864.61	341295.67	40°14'36.3489"N	80°14'6.3090"W	3.86	78.144	0.25	-0.07	-27.26
4346.00	0.370	8.950	4345.50	-1.33	1.41	3.96	1274864.80	341296.29	40°14'36.3551"N	80°14'6.3068"W	4.21	70.399	0.17	-0.12	-16.26
4434.00	0.480	52.080	4433.50	-1.13	1.92	4.30	1274865.14	341296.80	40°14'36.3602"N	80°14'6.3027"W	4.71	65.948	0.37	0.13	49.01
4523.00	0.540	34.420	4522.50	-1.01	2.49	4.83	1274865.67	341297.37	40°14'36.3660"N	80°14'6.2960"W	5.44	62.694	0.19	0.07	-19.84
4611.00	0.610	36.420	4610.49	-0.76	3.21	5.34	1274866.18	341298.09	40°14'36.3733"N	80°14'6.2897"W	6.24	58.981	0.08	0.08	2.27
4699.00	0.430	28.380	4698.49	-0.50	3.88	5.78	1274866.62	341298.76	40°14'36.3800"N	80°14'6.2843"W	6.96	56.116	0.22	-0.20	-9.14
4787.00	0.370	348.650	4786.49	-0.11	4.45	5.88	1274866.72	341299.33	40°14'36.3856"N	80°14'6.2832"W	7.37	52.881	0.32	-0.07	-45.15
4875.00	0.970	277.500	4874.48	0.67	4.83	5.09	1274865.93	341299.71	40°14'36.3891"N	80°14'6.2936"W	7.01	46.501	1.05	0.68	-80.85



# Actual Wellpath Report

BIRD RUN 10938 4H AWP Proj: 22305'

Page 4 of 12



## REFERENCE WELLPATH IDENTIFICATION

Operator	RANGE RESOURCES APPALACHIA, LLC	Well	BIRD RUN 10938 4H
Field	Washington	API	37-125-29188-0000
Facility	BIRD RUN 10938 Pad	Wellbore	BIRD RUN 10938 4H AWB
Slot	Slot #04		

## WELLPATH DATA (247 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
4963.00	1.410	262.830	4962.46	1.76	4.79	3.27	1274864.11	341299.67	40°14'36.3882"N	80°14'16.3170"W	5.80	34.353	0.60	0.50	-16.67
5051.00	1.900	262.370	5050.42	3.05	4.46	0.75	1274861.59	341299.34	40°14'36.3843"N	80°14'16.3493"W	4.52	9.577	0.56	0.56	-0.52
5139.00	2.840	254.310	5138.35	4.62	3.68	-2.79	1274858.05	341298.56	40°14'36.3756"N	80°14'16.3947"W	4.62	322.774	1.13	1.07	-9.16
5227.00	2.660	252.400	5226.25	6.15	2.47	-6.84	1274854.00	341297.35	40°14'36.3625"N	80°14'16.4464"W	7.27	289.850	0.23	-0.20	-2.17
5315.00	2.590	252.520	5314.15	7.56	1.25	-10.68	1274850.16	341296.13	40°14'36.3494"N	80°14'16.4955"W	10.75	276.696	0.08	-0.08	0.14
5404.00	3.120	242.410	5403.04	8.70	-0.47	-14.75	1274846.10	341294.41	40°14'36.3313"N	80°14'16.5473"W	14.75	268.167	0.82	0.60	-11.36
5483.00	3.080	229.760	5481.93	9.01	-2.84	-18.27	1274839.14	341288.71	40°14'36.3069"N	80°14'16.5919"W	18.49	261.169	0.87	-0.05	-16.01
5571.00	3.170	222.000	5569.80	8.49	-6.17	-21.70	1274832.33	341282.04	40°14'36.2730"N	80°14'16.6349"W	22.56	254.121	0.49	0.10	-8.82
5659.00	3.360	225.620	5657.66	7.78	-9.79	-25.17	1274825.67	341285.09	40°14'36.2364"N	80°14'16.6784"W	27.01	248.758	0.32	0.22	4.11
5747.00	3.240	217.020	5745.51	6.85	-13.58	-28.52	1274832.33	341281.31	40°14'36.1980"N	80°14'16.7201"W	31.58	244.543	0.58	-0.14	-9.77
5835.00	3.060	225.380	5833.38	5.94	-17.21	-31.68	1274829.16	341277.67	40°14'36.1612"N	80°14'16.7596"W	36.06	241.490	0.56	-0.20	9.50
5922.00	4.520	255.900	5920.19	7.06	-19.68	-36.66	1274824.18	341275.20	40°14'36.1355"N	80°14'16.8229"W	41.61	241.777	2.81	1.68	35.08
6011.00	6.670	286.580	6008.78	12.69	-19.06	-45.02	1274815.82	341275.82	40°14'36.1393"N	80°14'16.9308"W	48.89	247.058	4.06	2.42	34.47
6099.00	9.320	301.170	6095.93	23.52	-13.91	-56.02	1274804.82	341280.97	40°14'36.1871"N	80°14'17.0745"W	57.72	256.057	3.77	3.01	16.58
6120.00	9.830	304.450	6116.64	26.82	-12.01	-58.95	1274801.89	341282.87	40°14'36.2050"N	80°14'17.1130"W	60.16	258.481	3.56	2.43	15.62
6215.00	14.590	320.120	6209.49	46.52	1.77	-73.32	1274787.52	341296.65	40°14'36.3371"N	80°14'17.3032"W	73.34	271.380	6.06	5.01	16.49
6311.00	20.590	316.380	6300.98	75.36	23.23	-92.69	1274768.15	341318.11	40°14'36.5438"N	80°14'17.5607"W	95.56	284.072	6.26	6.16	-3.90
6406.00	26.520	319.710	6388.06	113.15	51.48	-117.91	1274742.94	341346.36	40°14'36.8158"N	80°14'17.8959"W	128.66	293.588	6.49	6.34	3.51
6501.00	34.600	318.340	6469.80	161.34	87.87	-149.60	1274711.24	341382.75	40°14'37.1664"N	80°14'18.3177"W	173.50	300.429	8.54	8.51	-1.44
6596.00	45.170	318.120	6542.59	222.04	133.23	-190.14	1274670.71	341428.11	40°14'37.6032"N	80°14'18.8567"W	232.17	305.020	11.13	11.13	-0.23
6691.00	55.870	319.550	6602.91	295.14	188.40	-238.27	1274622.57	341463.27	40°14'38.1348"N	80°14'19.4973"W	303.76	308.333	11.32	11.26	1.51
6786.00	61.130	320.560	6652.53	376.07	250.49	-290.25	1274570.60	341545.36	40°14'38.7336"N	80°14'10.1897"W	383.39	310.795	5.61	5.54	1.06
6881.00	69.210	321.740	6692.39	462.20	317.59	-344.26	1274516.59	341612.46	40°14'39.3815"N	80°14'10.9104"W	468.38	312.693	8.58	8.51	1.24
6976.00	76.810	323.260	6720.13	552.98	389.63	-399.51	1274461.35	341684.50	40°14'40.0777"N	80°14'11.6487"W	558.05	314.283	8.14	8.00	1.60
7070.00	85.540	325.540	6734.54	645.69	465.09	-453.51	1274407.35	341759.96	40°14'40.8081"N	80°14'12.3722"W	649.60	315.723	9.59	9.28	2.43
7165.00	88.810	324.350	6739.22	740.44	542.75	-508.00	1274352.86	341837.62	40°14'41.5601"N	80°14'13.1028"W	743.40	316.895	3.66	3.44	-1.25
7260.00	88.810	324.730	6741.19	835.33	620.12	-563.10	1274297.76	341914.97	40°14'42.3089"N	80°14'13.8412"W	837.63	317.759	0.40	0.00	0.40
7355.00	88.870	324.600	6743.12	930.20	697.60	-618.03	1274242.83	341992.46	40°14'43.0590"N	80°14'14.5774"W	931.99	318.461	0.15	0.06	-0.14
7450.00	88.750	321.670	6745.09	1025.16	773.58	-675.00	1274185.86	342068.43	40°14'43.7937"N	80°14'15.3395"W	1026.67	318.893	3.09	-0.13	-3.08
7545.00	88.760	321.310	6747.15	1120.13	847.90	-734.14	1274126.72	342142.75	40°14'44.5113"N	80°14'16.1288"W	1121.56	319.113	0.38	0.01	-0.38



# Actual Wellpath Report

BIRD RUN 10938 4H AWP Proj: 22305'

Page 5 of 12



## REFERENCE WELLPATH IDENTIFICATION

Operator	RANGE RESOURCES APPALACHIA, LLC	Well	BIRD RUN 10938 4H
Field	Washington	API	37-125-29188-0000
Facility	BIRD RUN 10938 Pad	Wellbore	BIRD RUN 10938 4H AWB
Slot	Slot #04		

## WELLPATH DATA (247 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [P/100ft]	Build Rate [P/100ft]	Turn Rate [P/100ft]
7639.00	89.020	321.580	1214.11	6748.98	921.40	-792.72	1274068.15	342216.24	40°14'45.2210"N	80°14'16.9106"W	1215.47	319.293	0.40	0.28	0.29
7733.00	88.840	321.440	6750.73	1308.09	994.96	-851.21	1274009.66	342289.80	40°14'45.9314"N	80°14'17.6914"W	1309.39	319.452	0.24	-0.19	-0.15
7828.00	89.020	321.820	6752.51	1403.07	1069.43	-910.17	1273950.70	342364.27	40°14'46.5506"N	80°14'18.4785"W	1404.31	319.599	0.44	0.19	0.40
7921.00	90.320	321.970	6753.04	1496.06	1142.60	-967.56	1273893.31	342437.44	40°14'47.3574"N	80°14'19.2448"W	1497.24	319.742	1.41	1.40	0.16
8016.00	91.580	322.790	6751.47	1591.05	1217.84	-1025.54	1273835.34	342512.68	40°14'48.0845"N	80°14'20.0196"W	1592.13	319.899	1.58	1.33	0.86
8111.00	91.090	322.240	6749.25	1686.02	1293.20	-1083.34	1273777.54	342588.04	40°14'48.8128"N	80°14'20.7921"W	1687.01	320.047	0.78	-0.52	-0.58
8206.00	91.090	322.500	6747.45	1781.00	1368.43	-1141.33	1273719.55	342663.26	40°14'49.5397"N	80°14'21.5670"W	1781.91	320.170	0.27	0.00	0.27
8301.00	91.060	324.130	6745.66	1875.95	1444.59	-1198.07	1273662.81	342739.42	40°14'50.2763"N	80°14'22.3261"W	1876.76	320.329	1.72	-0.03	1.72
8395.00	91.150	326.140	6743.85	1969.79	1521.70	-1251.79	1273609.09	342816.53	40°14'51.0230"N	80°14'23.0467"W	1970.42	320.558	2.14	0.10	2.14
8490.00	91.980	327.450	6741.26	2064.42	1601.16	-1303.80	1273557.09	342895.98	40°14'51.7934"N	80°14'23.7460"W	2064.85	320.845	1.63	0.87	1.38
8586.00	90.780	324.160	6738.94	2160.17	1680.53	-1357.73	1273503.16	342975.35	40°14'52.5623"N	80°14'24.4701"W	2160.46	321.065	3.65	-1.25	-3.43
8681.00	90.970	321.180	6737.49	2255.14	1756.05	-1415.32	1273445.57	343050.87	40°14'53.2923"N	80°14'25.2400"W	2255.40	321.132	3.14	0.20	-3.14
8775.00	90.780	320.520	6736.06	2349.11	1828.94	-1474.66	1273386.23	343123.75	40°14'53.9958"N	80°14'26.0315"W	2349.39	321.121	0.73	-0.20	-0.70
8870.00	90.810	320.580	6734.74	2444.07	1902.29	-1535.02	1273325.87	343197.10	40°14'54.7035"N	80°14'26.8363"W	2444.38	321.099	0.07	0.03	0.06
8965.00	91.150	321.230	6733.11	2539.04	1976.00	-1594.92	1273265.98	343270.81	40°14'55.4150"N	80°14'27.6353"W	2539.36	321.091	0.77	0.36	0.66
9060.00	91.180	320.650	6731.18	2634.00	2049.76	-1654.77	1273206.13	343344.56	40°14'56.1268"N	80°14'28.4336"W	2634.34	321.086	0.61	0.03	-0.61
9155.00	91.430	321.300	6729.02	2728.96	2123.54	-1714.57	1273146.33	343418.34	40°14'56.8390"N	80°14'29.2314"W	2729.32	321.082	0.73	0.26	0.68
9250.00	91.120	320.160	6726.90	2823.91	2197.06	-1774.69	1273086.22	343491.87	40°14'57.5485"N	80°14'30.0332"W	2824.29	321.070	1.24	-0.33	-1.20
9345.00	92.140	320.740	6724.20	2918.83	2270.29	-1835.15	1273025.75	343565.08	40°14'58.2549"N	80°14'30.8393"W	2919.24	321.050	1.24	1.07	0.61
9440.00	91.900	320.530	6720.85	3013.75	2343.69	-1895.37	1272965.54	343638.48	40°14'58.9632"N	80°14'31.6423"W	3014.18	321.037	0.34	-0.25	-0.22
9535.00	92.640	321.280	6717.09	3108.65	2417.36	-1955.23	1272905.68	343712.15	40°14'59.6742"N	80°14'32.4408"W	3109.11	321.033	1.11	0.78	0.79
9629.00	92.880	320.840	6712.56	3202.53	2490.39	-2014.24	1272846.67	343785.18	40°15'0.3791"N	80°14'33.2281"W	3203.00	321.034	0.53	0.26	-0.47
9724.00	93.010	320.850	6707.68	3297.39	2563.96	-2074.15	1272786.77	343858.74	40°15'1.0891"N	80°14'34.0272"W	3297.87	321.028	0.14	0.14	0.01
9819.00	91.710	317.980	6703.77	3392.20	2636.03	-2135.89	1272725.02	343930.82	40°15'1.7839"N	80°14'34.8494"W	3392.74	320.983	3.31	-1.37	-3.02
9913.00	92.880	321.200	6700.01	3486.02	2707.54	-2196.77	1272664.15	344002.32	40°15'2.4732"N	80°14'35.6603"W	3486.63	320.946	3.64	1.24	3.43
10008.00	92.390	319.960	6695.64	3580.89	2780.85	-2257.03	1272603.89	344075.63	40°15'3.1805"N	80°14'36.4638"W	3581.52	320.936	1.40	-0.52	-1.31
10103.00	93.040	320.810	6691.14	3675.75	2853.95	-2317.54	1272543.39	344148.72	40°15'3.8857"N	80°14'37.2705"W	3676.41	320.922	1.13	0.68	0.89
10198.00	92.580	318.840	6686.48	3770.56	2926.44	-2378.75	1272482.18	344221.22	40°15'4.5848"N	80°14'38.0860"W	3771.27	320.894	2.13	-0.48	-2.07
10293.00	91.780	320.660	6682.87	3865.41	2998.89	-2440.08	1272420.85	344293.66	40°15'5.2833"N	80°14'38.9031"W	3866.18	320.866	2.09	-0.84	1.92
10388.00	90.980	319.850	6680.58	3960.34	3071.92	-2500.80	1272360.13	344366.68	40°15'5.9877"N	80°14'39.7125"W	3961.15	320.851	1.20	-0.84	-0.95



# Actual Wellpath Report

BIRD RUN 10938 4H AWP Proj: 22305'  
Page 6 of 12



## REFERENCE WELLPATH IDENTIFICATION

Operator	RANGE RESOURCES APPALACHIA, LLC	Well	BIRD RUN 10938 4H
Field	Washington	API	37-125-29188-0000
Facility	BIRD RUN 10938 Pad	Wellbore	BIRD RUN 10938 4H AWB
Slot	Slot #04		

## WELLPATH DATA (247 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
10483.00	90.580	315.890	6678.28	4055.06	3142.35	-2564.51	1272296.42	344437.12	40°15'9.6657"N	80°14'40.5595"W	4055.99	320.782	4.19	-0.42	-4.17
10578.00	90.760	319.170	6678.17	4149.75	3212.41	-2628.64	1272232.29	344507.17	40°15'7.3398"N	80°14'41.4118"W	4150.82	320.707	3.46	0.19	3.45
10672.00	90.730	321.610	6676.95	4243.70	3284.82	-2688.56	1272172.37	344579.58	40°15'9.0383"N	80°14'42.2107"W	4244.81	320.700	2.60	-0.03	2.60
10767.00	90.850	322.830	6675.64	4338.69	3359.89	-2746.76	1272114.18	344654.65	40°15'8.7637"N	80°14'42.9883"W	4339.76	320.734	1.29	0.13	1.28
10862.00	90.510	318.910	6674.51	4433.64	3433.57	-2806.69	1272054.25	344728.32	40°15'9.4747"N	80°14'43.7878"W	4434.74	320.736	4.14	-0.36	-4.13
10957.00	90.670	321.260	6673.53	4528.58	3506.42	-2867.64	1271993.30	344801.17	40°15'10.1773"N	80°14'44.6002"W	4529.72	320.723	2.48	0.17	2.47
11052.00	90.520	321.770	6672.55	4623.57	3580.78	-2926.76	1271934.19	344875.53	40°15'10.8953"N	80°14'45.3894"W	4624.71	320.739	0.56	-0.16	0.54
11147.00	90.820	323.860	6671.44	4718.55	3656.46	-2984.17	1271876.78	344951.20	40°15'11.6268"N	80°14'46.1571"W	4719.63	320.781	2.22	0.32	2.20
11242.00	90.330	323.940	6670.48	4813.49	3733.21	-3040.14	1271820.81	345027.96	40°15'12.3694"N	80°14'46.9067"W	4814.49	320.842	0.52	-0.52	0.08
11337.00	90.330	323.830	6669.94	4908.44	3809.95	-3096.13	1271764.82	345104.70	40°15'13.1118"N	80°14'47.6565"W	4909.36	320.901	0.12	0.00	-0.12
11432.00	90.300	323.730	6669.41	5003.39	3886.59	-3152.27	1271708.69	345181.33	40°15'13.8532"N	80°14'48.4082"W	5004.24	320.956	0.11	-0.03	-0.11
11527.00	90.080	322.760	6668.10	5098.37	3962.71	-3209.11	1271651.84	345257.44	40°15'14.5891"N	80°14'49.1688"W	5099.16	320.998	1.05	-0.23	-1.02
11622.00	90.360	323.770	6666.73	5193.34	4038.84	-3265.93	1271595.02	345333.57	40°15'15.3253"N	80°14'49.9291"W	5194.09	321.040	1.10	0.29	1.06
11717.00	90.390	323.720	6668.11	5288.30	4115.45	-3322.11	1271538.85	345410.18	40°15'16.0663"N	80°14'50.6814"W	5288.98	321.088	0.06	0.03	-0.05
11812.00	90.330	323.660	6667.52	5383.25	4192.00	-3378.37	1271482.50	345486.73	40°15'16.8067"N	80°14'51.4345"W	5383.88	321.134	0.09	-0.06	-0.06
11907.00	90.300	323.670	6666.99	5478.21	4268.52	-3434.65	1271426.31	345563.25	40°15'17.5469"N	80°14'52.1881"W	5478.79	321.178	0.03	-0.03	0.01
12002.00	90.450	324.340	6666.37	5573.15	4345.38	-3490.48	1271370.48	345640.11	40°15'18.2906"N	80°14'52.9360"W	5573.67	321.226	0.72	0.16	0.71
12097.00	90.420	323.680	6665.65	5668.09	4422.25	-3546.31	1271314.66	345716.97	40°15'19.0342"N	80°14'53.6837"W	5668.56	321.273	0.70	-0.03	-0.69
12192.00	90.640	323.950	6664.77	5763.04	4498.92	-3602.39	1271258.58	345793.64	40°15'19.7759"N	80°14'54.4348"W	5763.46	321.315	0.37	0.23	0.28
12287.00	90.550	323.650	6663.79	5857.98	4575.68	-3658.36	1271202.61	345870.39	40°15'20.5184"N	80°14'55.1844"W	5858.36	321.357	0.14	-0.09	-0.11
12382.00	90.550	324.470	6662.87	5952.91	4652.68	-3713.99	1271146.99	345947.40	40°15'21.2636"N	80°14'55.9296"W	5953.25	321.402	0.65	0.00	0.65
12476.00	89.900	321.390	6662.50	6046.89	4727.68	-3770.64	1271090.33	346022.39	40°15'21.9885"N	80°14'56.6874"W	6047.20	321.425	3.35	-0.69	-3.28
12571.00	90.270	321.480	6662.36	6141.88	4801.96	-3829.86	1271031.11	346096.66	40°15'22.7057"N	80°14'57.4781"W	6142.20	321.425	0.40	0.39	0.09
12666.00	90.450	322.640	6661.77	6236.88	4876.88	-3888.27	1270972.71	346171.58	40°15'23.4294"N	80°14'58.2585"W	6237.19	321.435	1.24	0.19	1.22
12761.00	90.150	321.490	6661.27	6331.88	4951.80	-3946.67	1270914.31	346246.50	40°15'24.1532"N	80°14'59.0388"W	6332.18	321.445	1.25	-0.32	-1.21
12856.00	90.390	321.490	6660.82	6426.87	5026.14	-4005.82	1270855.16	346320.84	40°15'24.8709"N	80°14'59.8286"W	6427.18	321.445	0.25	0.25	0.00
12951.00	90.450	322.200	6660.12	6521.87	5100.84	-4064.51	1270796.47	346395.53	40°15'25.5924"N	80°15'0.6125"W	6522.18	321.451	0.75	0.06	0.75
13046.00	90.270	321.550	6659.53	6616.86	5175.57	-4123.16	1270737.83	346470.26	40°15'26.3142"N	80°15'1.3959"W	6617.17	321.457	0.71	-0.19	-0.68
13141.00	90.240	321.000	6659.11	6711.86	5249.68	-4182.59	1270678.40	346544.37	40°15'27.0296"N	80°15'2.1892"W	6712.17	321.455	0.58	-0.03	-0.58
13236.00	90.140	321.090	6658.79	6806.84	5323.56	-4242.32	1270618.67	346618.25	40°15'27.7426"N	80°15'2.9863"W	6807.17	321.449	0.14	-0.11	0.09



# Actual Wellpath Report

BIRD RUN 10938 4H AWP Proj: 22305  
Page 7 of 12



## REFERENCE WELLPATH IDENTIFICATION

Operator	RANGE RESOURCES APPALACHIA, LLC	Well	BIRD RUN 10938 4H
Field	Washington	API	37-125-29188-0000
Facility	BIRD RUN 10938 Pad	Wellbore	BIRD RUN 10938 4H AWB
Slot	Slot #04		

## WELLPATH DATA (247 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
13331.00	90.420	322.090	6658.33	6901.84	5398.00	-4301.34	1270559.66	346692.68	40°15'28.4614"N	80°15'3.7744"W	6902.17	321.451	1.09	0.29	1.05
13426.00	90.450	321.610	6657.60	6996.83	5472.70	-4360.02	1270500.98	346767.39	40°15'29.1829"N	80°15'4.5583"W	6997.16	321.456	0.51	0.03	-0.51
13521.00	90.480	321.930	6656.83	7091.83	5547.33	-4418.81	1270442.19	346842.01	40°15'29.9036"N	80°15'5.3435"W	7092.16	321.460	0.34	0.03	0.34
13616.00	90.390	321.960	6656.11	7186.83	5622.13	-4477.36	1270383.64	346916.81	40°15'30.8261"N	80°15'6.1258"W	7187.15	321.467	0.10	-0.09	0.03
13710.00	90.480	321.980	6655.40	7280.82	5696.17	-4535.27	1270325.73	346990.84	40°15'31.3413"N	80°15'6.8995"W	7281.14	321.473	0.10	0.10	0.02
13805.00	90.330	322.010	6654.73	7375.82	5771.02	-4593.77	1270267.24	347065.69	40°15'32.0643"N	80°15'7.6810"W	7376.14	321.480	0.16	-0.16	0.03
13900.00	90.240	321.140	6654.25	7470.82	5845.45	-4652.81	1270208.20	347140.12	40°15'32.7829"N	80°15'8.4695"W	7471.13	321.481	0.92	-0.09	-0.92
13995.00	90.180	320.960	6653.91	7565.80	5919.33	-4712.53	1270148.48	347213.99	40°15'33.4960"N	80°15'9.2665"W	7566.13	321.476	0.20	-0.06	-0.19
14090.00	90.510	321.920	6653.33	7660.79	5993.61	-4771.74	1270089.27	347288.27	40°15'34.2132"N	80°15'10.0571"W	7661.13	321.475	1.07	0.35	1.01
14185.00	90.270	321.650	6652.69	7755.79	6068.25	-4830.51	1270030.50	347362.91	40°15'34.9340"N	80°15'10.8421"W	7756.12	321.479	0.38	-0.25	-0.28
14280.00	90.730	322.160	6651.86	7850.79	6143.01	-4889.12	1269971.90	347437.67	40°15'35.6561"N	80°15'11.6251"W	7851.12	321.484	0.72	0.48	0.54
14375.00	90.510	322.070	6650.83	7945.78	6217.98	-4947.45	1269913.57	347512.64	40°15'36.3803"N	80°15'12.4046"W	7946.11	321.492	0.25	-0.23	-0.05
14470.00	90.820	322.040	6649.73	8040.77	6292.90	-5005.86	1269855.16	347587.55	40°15'37.1039"N	80°15'13.1852"W	8041.10	321.498	0.33	0.33	-0.03
14565.00	90.750	321.680	6648.42	8135.77	6367.61	-5064.53	1269796.49	347662.26	40°15'37.8255"N	80°15'13.9689"W	8136.08	321.503	0.38	-0.06	-0.38
14660.00	90.790	321.310	6647.13	8230.75	6441.94	-5123.67	1269737.36	347736.59	40°15'38.5432"N	80°15'14.7586"W	8231.08	321.503	0.39	0.03	-0.39
14755.00	90.420	321.420	6645.87	8325.73	6515.93	-5183.24	1269677.78	347810.58	40°15'39.2574"N	80°15'15.5538"W	8326.07	321.499	0.32	-0.06	-0.32
14851.00	90.420	321.420	6644.91	8421.72	6590.76	-5243.37	1269617.65	347885.40	40°15'39.9797"N	80°15'16.3564"W	8422.06	321.495	0.54	-0.32	0.43
14946.00	91.010	322.170	6643.72	8516.71	6665.40	-5302.12	1269558.91	347960.04	40°15'40.7005"N	80°15'17.1413"W	8517.05	321.499	1.00	0.62	0.73
15041.00	90.850	321.830	6642.18	8611.70	6740.25	-5360.60	1269500.43	348034.89	40°15'41.4235"N	80°15'17.9227"W	8612.03	321.504	0.40	-0.17	-0.36
15136.00	90.910	322.180	6640.72	8706.69	6815.11	-5419.08	1269441.96	348109.75	40°15'42.1465"N	80°15'18.7040"W	8707.02	321.510	0.37	0.06	0.37
15231.00	90.980	322.020	6639.16	8801.67	6890.06	-5477.43	1269383.61	348184.70	40°15'42.8706"N	80°15'19.4838"W	8802.00	321.516	0.18	0.07	-0.17
15326.00	90.910	321.770	6637.59	8896.66	6964.81	-5536.04	1269324.99	348259.44	40°15'43.5924"N	80°15'20.2669"W	8896.98	321.520	0.27	-0.07	-0.26
15421.00	90.950	321.690	6636.05	8991.65	7039.38	-5594.88	1269266.16	348334.01	40°15'44.3126"N	80°15'21.0528"W	8991.97	321.522	0.09	0.04	-0.08
15516.00	90.820	321.840	6634.58	9086.63	7113.99	-5653.66	1269207.38	348408.62	40°15'45.0331"N	80°15'21.8381"W	9086.96	321.525	0.21	-0.14	0.16
15611.00	90.880	321.740	6633.17	9181.62	7188.63	-5712.42	1269148.63	348483.25	40°15'45.7539"N	80°15'22.6230"W	9181.95	321.528	0.12	0.06	-0.11
15706.00	90.880	321.800	6631.71	9276.61	7263.25	-5771.20	1269089.85	348557.87	40°15'46.4745"N	80°15'23.4083"W	9276.94	321.530	0.06	0.00	0.06
15801.00	90.980	322.170	6630.17	9371.60	7338.08	-5829.70	1269031.35	348632.70	40°15'47.1973"N	80°15'24.1900"W	9371.92	321.535	0.40	0.11	0.39
15896.00	91.010	322.200	6628.52	9466.58	7413.12	-5887.94	1268973.11	348707.74	40°15'47.9222"N	80°15'24.9683"W	9466.90	321.541	0.04	0.03	0.03
15991.00	90.820	321.740	6627.00	9561.57	7487.94	-5946.46	1268914.60	348782.55	40°15'48.6448"N	80°15'25.7503"W	9561.88	321.546	0.52	-0.20	-0.48
16086.00	90.850	321.940	6625.62	9656.56	7562.63	-6005.15	1268855.91	348857.24	40°15'49.3661"N	80°15'26.5344"W	9656.97	321.548	0.21	0.03	0.21

## REFERENCE WELLPATH IDENTIFICATION

Operator	RANGE RESOURCES APPALACHIA, LLC	Well	BIRD RUN 10938 4H
Field	Washington	API	37-125-29188-0000
Facility	BIRD RUN 10938 Pad	Wellbore	BIRD RUN 10938 4H AWB
Slot	Slot #04		

## WELLPATH DATA (247 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist. [ft]	Closure Dir [°]	DLS ["/100ft]	Build Rate ["/100ft]	Turn Rate ["/100ft]
16181.00	90.980	322.010	6624.10	9751.55	7637.46	-6063.66	1268797.40	348932.06	40°15'50.0889"N	80°15'27.3163"W	9751.86	321.553	0.16	0.14	0.07
16276.00	91.130	321.680	6622.35	9846.53	7712.15	-6122.34	1268738.72	349006.75	40°15'50.8102"N	80°15'28.1003"W	9846.84	321.555	0.38	0.16	-0.35
16371.00	90.980	321.520	6620.60	9941.51	7786.59	-6181.34	1268679.72	349081.19	40°15'51.5289"N	80°15'28.8883"W	9941.83	321.556	0.23	-0.16	-0.17
16465.00	91.130	321.950	6618.87	10035.50	7860.38	-6239.54	1268621.52	349154.98	40°15'52.2415"N	80°15'29.6658"W	10035.81	321.558	0.48	0.16	0.46
16560.00	91.040	321.990	6617.07	10130.48	7935.20	-6298.06	1268583.01	349229.79	40°15'52.9641"N	80°15'30.4478"W	10130.79	321.561	0.10	-0.09	0.04
16654.00	91.100	321.920	6615.32	10224.46	8009.21	-6355.98	1268505.09	349303.80	40°15'53.6789"N	80°15'31.2217"W	10224.77	321.565	0.10	0.06	-0.07
16749.00	91.040	321.600	6613.54	10319.44	8083.81	-6414.77	1268446.30	349378.40	40°15'54.3994"N	80°15'32.0072"W	10319.75	321.567	0.34	-0.06	-0.34
16844.00	90.790	321.550	6612.03	10414.43	8158.23	-6473.80	1268387.27	349452.81	40°15'55.1179"N	80°15'32.7956"W	10414.74	321.567	0.27	0.26	-0.05
16938.00	91.040	321.530	6610.53	10508.41	8231.82	-6532.26	1268328.81	349526.41	40°15'55.8284"N	80°15'33.5764"W	10508.73	321.567	0.27	0.27	-0.02
17033.00	91.040	321.620	6608.80	10603.40	8306.24	-6591.29	1268269.78	349600.82	40°15'56.5469"N	80°15'34.3649"W	10603.71	321.567	0.09	0.00	0.09
17127.00	91.070	321.920	6607.07	10697.38	8380.06	-6649.45	1268211.63	349674.64	40°15'57.2598"N	80°15'35.1419"W	10697.70	321.569	0.32	0.03	0.32
17222.00	91.130	321.810	6605.25	10792.36	8454.77	-6708.11	1268152.98	349749.35	40°15'57.9813"N	80°15'35.9255"W	10792.68	321.571	0.13	0.06	-0.12
17316.00	91.160	321.700	6603.37	10886.34	8528.58	-6766.28	1268094.80	349823.16	40°15'58.6941"N	80°15'36.7028"W	10886.66	321.573	0.12	0.03	-0.12
17411.00	91.040	321.870	6601.55	10981.32	8603.21	-6825.04	1268036.05	349897.78	40°15'59.4147"N	80°15'37.4878"W	10981.64	321.575	0.22	-0.13	0.18
17505.00	91.070	321.680	6599.81	11075.31	8677.04	-6883.19	1267977.89	349971.61	40°16'0.1277"N	80°15'38.2647"W	11075.62	321.576	0.20	0.03	-0.20
17600.00	91.100	321.830	6598.02	11170.29	8751.64	-6941.99	1267919.10	350046.21	40°16'0.8480"N	80°15'39.0503"W	11170.61	321.578	0.16	0.03	0.16
17695.00	91.070	321.940	6596.22	11265.27	8826.37	-7000.62	1267860.47	350120.93	40°16'1.5688"N	80°15'39.8337"W	11265.59	321.580	0.12	-0.03	0.12
17790.00	90.980	321.710	6594.52	11360.26	8901.04	-7059.32	1267801.77	350195.60	40°16'2.2908"N	80°15'40.6181"W	11360.57	321.582	0.26	-0.09	-0.24
17884.00	91.320	321.520	6592.63	11454.23	8974.71	-7117.68	1267743.42	350269.27	40°16'3.0021"N	80°15'41.3976"W	11454.55	321.583	0.41	0.36	-0.20
17979.00	91.260	320.730	6590.49	11549.20	9048.65	-7177.29	1267683.81	350343.20	40°16'3.7157"N	80°15'42.1934"W	11549.52	321.579	0.83	-0.06	-0.83
18074.00	91.320	320.570	6588.35	11644.15	9122.09	-7237.51	1267623.59	350416.64	40°16'4.4243"N	80°15'42.9968"W	11644.49	321.571	0.18	0.06	-0.17
18169.00	90.850	320.290	6586.55	11739.09	9195.31	-7298.02	1267563.09	350489.86	40°16'5.1305"N	80°15'43.8039"W	11739.45	321.562	0.58	-0.49	-0.29
18283.00	90.670	320.190	6585.04	11853.03	9282.94	-7370.92	1267490.18	350577.48	40°16'5.9756"N	80°15'44.7762"W	11853.41	321.549	0.18	-0.16	-0.09
18358.00	91.320	321.620	6583.74	11928.00	9341.13	-7418.21	1267442.90	350635.68	40°16'6.5372"N	80°15'45.4073"W	11928.39	321.545	2.09	0.87	1.91
18453.00	91.290	322.890	6581.58	12022.97	9416.23	-7476.35	1267384.76	350710.77	40°16'7.2626"N	80°15'46.1846"W	12023.36	321.551	1.34	-0.03	1.34
18548.00	91.380	323.000	6579.36	12117.94	9492.03	-7533.57	1267327.54	350786.57	40°16'7.9952"N	80°15'46.9504"W	12118.31	321.562	0.15	0.09	0.12
18643.00	90.730	322.750	6577.61	12212.91	9567.76	-7590.90	1267270.21	350862.30	40°16'8.7272"N	80°15'47.7174"W	12213.26	321.572	0.73	-0.68	-0.26
18737.00	90.850	322.930	6576.32	12306.89	9642.67	-7647.68	1267213.44	350937.20	40°16'9.4511"N	80°15'48.4771"W	12307.23	321.582	0.23	0.13	0.19
18832.00	90.730	322.430	6575.01	12401.87	9718.21	-7705.27	1267155.85	351012.74	40°16'10.1811"N	80°15'49.2474"W	12402.21	321.590	0.54	-0.13	-0.53
18927.00	90.270	322.690	6574.18	12496.86	9793.63	-7763.02	1267098.10	351088.16	40°16'10.9099"N	80°15'50.0198"W	12497.19	321.598	0.56	-0.48	0.27



# Actual Wellpath Report

BIRD RUN 10938 4H AWP Proj: 22305'

Page 9 of 12



## REFERENCE WELLPATH IDENTIFICATION

Operator	RANGE RESOURCES APPALACHIA, LLC	Well	BIRD RUN 10938 4H
Field	Washington	API	37-125-29188-0000
Facility	BIRD RUN 10938 Pad	Wellbore	BIRD RUN 10938 4H AWB
Slot	Slot #04		

## WELLPATH DATA (247 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
19022.00	90.330	322.540	6573.68	12591.86	9869.12	-7820.70	1267040.42	351163.64	40°16'11.6393"N	80°15'50.7914"W	12592.17	321.605	0.17	0.06	-0.16
19116.00	90.240	322.820	6573.21	12685.85	9943.77	-7877.82	1266983.31	351238.29	40°16'12.3607"N	80°15'51.5553"W	12686.16	321.612	0.13	-0.10	0.03
19211.00	89.810	322.650	6573.17	12780.85	10019.28	-7935.47	1266925.65	351313.80	40°16'13.0903"N	80°15'52.3265"W	12781.14	321.620	0.45	-0.45	0.03
19306.00	89.960	323.140	6573.36	12875.83	10095.04	-7992.78	1266868.35	351389.56	40°16'13.8226"N	80°15'53.0934"W	12876.12	321.629	0.54	0.16	0.52
19401.00	89.840	322.960	6573.53	12970.82	10170.96	-8049.89	1266811.24	351465.48	40°16'14.5564"N	80°15'53.8577"W	12971.09	321.640	0.23	-0.13	-0.19
19496.00	89.930	323.020	6573.72	13065.80	10246.82	-8107.07	1266754.06	351541.33	40°16'15.2897"N	80°15'54.6230"W	13066.06	321.650	0.11	0.09	0.06
19591.00	90.050	322.980	6573.74	13160.79	10322.69	-8164.25	1266696.89	351617.20	40°16'16.0230"N	80°15'55.3882"W	13161.04	321.659	0.13	0.13	-0.04
19686.00	89.750	322.670	6573.90	13255.78	10398.39	-8221.65	1266639.49	351692.89	40°16'16.7546"N	80°15'56.1562"W	13256.02	321.668	0.45	-0.32	-0.33
19780.00	90.150	323.400	6573.98	13349.76	10473.49	-8278.17	1266582.96	351768.00	40°16'17.4806"N	80°15'56.9128"W	13349.99	321.677	0.89	0.43	0.78
19875.00	89.960	322.840	6573.89	13444.75	10549.48	-8335.19	1266525.95	351843.98	40°16'18.2151"N	80°15'57.6759"W	13444.96	321.688	0.62	-0.20	-0.53
19970.00	90.090	322.540	6573.85	13539.74	10625.04	-8392.77	1266468.37	351919.54	40°16'18.9453"N	80°15'58.4462"W	13539.94	321.695	0.34	0.14	-0.32
20064.00	90.300	322.870	6573.53	13633.73	10699.82	-8449.73	1266411.42	351994.32	40°16'19.6679"N	80°15'59.2082"W	13633.93	321.702	0.42	0.22	0.35
20159.00	90.270	322.670	6573.06	13728.72	10775.46	-8507.20	1266353.95	352069.95	40°16'20.3989"N	80°15'59.9772"W	13728.91	321.709	0.21	-0.03	-0.21
20254.00	90.360	322.840	6572.54	13823.71	10851.08	-8564.70	1266296.45	352145.57	40°16'21.1297"N	80°16'0.7465"W	13823.89	321.716	0.20	0.09	0.18
20349.00	90.760	322.770	6571.61	13918.70	10926.76	-8622.12	1266239.03	352221.24	40°16'21.8610"N	80°16'1.5149"W	13918.87	321.724	0.43	0.42	-0.07
20444.00	90.670	322.690	6570.42	14013.68	11002.35	-8679.65	1266181.50	352296.83	40°16'22.5915"N	80°16'2.2845"W	14013.85	321.730	0.13	-0.09	-0.08
20538.00	90.520	322.790	6569.45	14107.67	11077.16	-8736.56	1266124.60	352371.64	40°16'23.3144"N	80°16'3.0459"W	14107.83	321.737	0.19	-0.16	0.11
20633.00	90.580	322.040	6568.53	14202.66	11152.44	-8794.50	1266066.66	352446.92	40°16'24.0417"N	80°16'3.8208"W	14202.82	321.742	0.79	0.06	-0.79
20728.00	90.730	322.210	6567.45	14297.66	11227.42	-8852.82	1266008.34	352521.90	40°16'24.7659"N	80°16'4.6005"W	14297.81	321.744	0.24	0.16	0.81
20823.00	91.040	322.980	6565.98	14392.64	11302.88	-8910.52	1265950.64	352597.35	40°16'25.4950"N	80°16'5.3723"W	14392.79	321.750	0.87	0.33	0.81
20918.00	91.130	322.790	6564.18	14487.61	11378.62	-8967.83	1265893.33	352673.09	40°16'26.2270"N	80°16'6.1393"W	14487.75	321.757	0.22	0.09	-0.20
21013.00	91.100	322.830	6562.33	14582.58	11454.29	-9025.24	1265835.92	352748.75	40°16'26.9583"N	80°16'6.9075"W	14582.72	321.764	0.05	-0.03	0.04
21108.00	90.980	322.550	6560.61	14677.56	11529.83	-9082.82	1265778.35	352824.30	40°16'27.6883"N	80°16'7.6778"W	14677.69	321.770	0.32	-0.13	-0.29
21203.00	90.790	322.570	6559.14	14772.55	11605.25	-9140.56	1265720.61	352899.72	40°16'28.4170"N	80°16'8.4503"W	14772.67	321.775	0.20	-0.20	0.02
21298.00	90.580	322.780	6558.01	14867.53	11680.79	-9198.16	1265663.01	352975.25	40°16'29.1469"N	80°16'9.2208"W	14867.65	321.781	0.31	-0.22	0.22
21393.00	90.610	322.830	6557.02	14962.52	11756.46	-9255.59	1265605.58	353050.92	40°16'29.8782"N	80°16'9.9893"W	14962.63	321.787	0.06	0.03	0.05
21488.00	90.580	322.820	6556.03	15057.50	11832.15	-9312.99	1265548.19	353126.61	40°16'30.6097"N	80°16'10.7574"W	15057.61	321.794	0.03	-0.03	-0.01
21583.00	90.580	321.700	6555.07	15152.50	11907.28	-9371.13	1265490.04	353201.73	40°16'31.3354"N	80°16'11.5349"W	15152.60	321.797	1.18	0.00	-1.18
21678.00	90.520	321.820	6554.16	15247.49	11981.89	-9429.93	1265431.25	353276.34	40°16'32.0558"N	80°16'12.3206"W	15247.60	321.797	0.14	-0.06	0.13
21773.00	90.790	322.040	6553.07	15342.49	12056.67	-9488.51	1265372.67	353351.12	40°16'32.7780"N	80°16'13.1036"W	15342.59	321.798	0.37	0.28	0.23



# Actual Wellpath Report

BIRD RUN 10938 4H AWP Proj: 22305'

Page 10 of 12



## REFERENCE WELLPATH IDENTIFICATION

Operator	RANGE RESOURCES APPALACHIA, LLC	Well	BIRD RUN 10938 4H
Field	Washington	API	37-125-29188-0000
Facility	BIRD RUN 10938 Pad	Wellbore	BIRD RUN 10938 4H AWB
Slot	Slot #04		

## WELLPATH DATA (247 stations) † = interpolated, ‡ = extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Closure Dist [ft]	Closure Dir [°]	DLS [°/100ft]	Build Rate [°/100ft]	Turn Rate [°/100ft]
21868.00	90.420	321.530	6552.07	15437.48	12131.31	-9547.27	1265313.91	353425.75	40°16'33.4987"N	80°16'13.8889"W	15437.59	321.797	0.66	-0.39	-0.54
21963.00	91.100	321.870	6550.81	15532.47	12205.85	-9606.14	1265255.04	353500.30	40°16'34.2184"N	80°16'14.6756"W	15532.58	321.797	0.80	0.72	0.36
22058.00	91.660	322.120	6548.52	15627.44	12280.69	-9664.62	1265196.57	353575.13	40°16'34.9411"N	80°16'15.4574"W	15627.55	321.798	0.65	0.59	0.26
22153.00	91.620	321.960	6545.80	15722.40	12355.56	-9723.03	1265138.16	353650.00	40°16'35.6642"N	80°16'16.2382"W	15722.51	321.800	0.17	-0.04	-0.17
22248.00	91.560	321.780	6543.17	15817.36	12430.26	-9781.67	1265079.52	353724.69	40°16'36.3855"N	80°16'17.0219"W	15817.47	321.800	0.20	-0.06	-0.19
22280.00	91.690	321.890	6542.26	15849.35	12455.41	-9801.43	1265059.76	353749.84	40°16'36.8284"N	80°16'17.2861"W	15849.46	321.800	0.53	0.41	0.34
22305.00‡	91.690	321.890	6541.52	15874.34	12475.07	-9816.86	1265044.34	353769.50	40°16'36.8182"N	80°16'17.4923"W	15874.45	321.800	0.00	0.00	0.00

## HOLE & CASING SECTIONS - Ref Wellbore: BIRD RUN 10938 4H AWB Ref Wellpath: BIRD RUN 10938 4H AWP Proj: 22305'

String/Diameter	Start MD [ft]	End MD [ft]	Interval [ft]	Start TVD [ft]	End TVD [ft]	Start N/S [ft]	End N/S [ft]	Start E/W [ft]	End E/W [ft]
26in Conductor	26.00	67.00	41.00	26.00	67.00	0.00	-0.11	0.00	0.13
24in Open Hole	67.00	240.00	173.00	67.00	239.99	-0.11	-1.42	0.13	0.77
18.625in Casing Surface	26.00	220.00	194.00	26.00	219.99	0.00	-1.24	0.00	0.72
17.5in Open Hole	240.00	319.00	79.00	239.99	318.99	-1.42	-2.09	0.77	0.85
13.375in Casing	26.00	308.00	282.00	26.00	307.99	0.00	-2.00	0.00	0.85
12.25in Open Hole	319.00	1700.00	1381.00	318.99	1699.66	-2.09	0.28	0.85	-0.29
9.625in Casing Intermediate	26.00	1680.00	1654.00	26.00	1679.67	0.00	-0.03	0.00	0.34
8.75in Open Hole	1700.00	6174.00	4474.00	1699.66	6169.62	0.28	-5.31	-0.29	-66.88
8.5in Open Hole	6174.00	22305.00	16131.00	6169.62	6541.52	-5.31	12475.07	-66.88	-9816.86
5.5in Casing Production	26.00	22305.00	22279.00	26.00	6541.52	0.00	12475.07	0.00	-9816.86



# Actual Wellpath Report

BIRD RUN 10938 4H AWP Proj: 22305'

Page 11 of 12



## REFERENCE WELLPATH IDENTIFICATION

Operator	RANGE RESOURCES APPALACHIA, LLC	Well	BIRD RUN 10938 4H
Field	Washington	API	37-125-29188-0000
Facility	BIRD RUN 10938 Pad	Wellbore	BIRD RUN 10938 4H AWB
Slot	Slot #04		

## TARGETS

Name	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
BIRD RUN 10938 4H BHL Rev-4	6513.05	12468.78	-9825.79	1265035.40	353763.21	40°16'36.7536"N	80°16'17.6052"W	point
BIRD RUN 10938 4H LP Rev-4	6725.30	459.90	-446.83	1274414.03	341754.76	40°14'40.7586"N	80°14'12.2842"W	point

## WELLPATH COMPOSITION - Ref Wellbore: BIRD RUN 10938 4H AWB Ref Wellpath: BIRD RUN 10938 4H AWP Proj: 22305'

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore	Survey Date
26.00	252.00	Gyrodata 2015 - CT+WIR+DPIPE	01_Gyrodata Cont. Gyro <17-1/2"> (50'-237')	BIRD RUN 10938 4H AWB	3/25/2025
252.00	1627.00	OWSG MWD rev2 + IFR1 + Sag Correction	02_Total MWD+SuperiorQC IFR1+Sag <12-1/4"> (237')(3'19'-1612')	BIRD RUN 10938 4H AWB	3/25/2025
1627.00	6099.00	OWSG MWD rev2 + IFR1 + Sag + Multi-Station Correction	03_Total MWD+SuperiorQC IFR1+Sag+FDIR <8-3/4"> (1612')(1706'-6084')	BIRD RUN 10938 4H AWB	3/25/2025
6099.00	22305.00	OWSG MWD rev2 + IFR1 + Sag + Multi-Station Correction	04_BH Lucida+SuperiorQC IFR1+Sag+FDIR <8-1/2"> (6099')(6120'-22280')	BIRD RUN 10938 4H AWB	4/21/2025



**Actual Wellpath Report**  
 BIRD RUN 10938 4H AWP Proj: 22305'  
 Page 12 of 12



REFERENCE WELLPATH IDENTIFICATION			
Operator	RANGE RESOURCES APPALACHIA, LLC	Well	BIRD RUN 10938 4H
Field	Washington	API	37-125-29188-0000
Facility	BIRD RUN 10938 Pad	Wellbore	BIRD RUN 10938 4H AWB
Slot	Slot #04		

COMMENTS
<p>Wellpath general comments            API: 37-125-29188-0000            BH Job #: 112639168            Rig: Patterson 876            Duration: 4/24/2025-4/27/2025            Gyrodata Cont. Gyro &lt;17-1/2"&gt; (50'-237')            Total MWD+SuperiorQC IFR1+Sag &lt;12-1/4"&gt; (237')(319'-1612')            Total MWD+SuperiorQC IFR1+Sag+FDIR &lt;8-3/4"&gt; (1612')(1706'-6084')            BH Lucida+SuperiorQC IFR1+Sag+FDIR &lt;8-1/2"&gt; (6099')(6120'-22280')            Projected MD at TD: 22305'</p>

## Teresa Matinko

---

**From:** Jason Hicks  
**Sent:** Tuesday, May 27, 2025 11:01 AM  
**To:** Teresa Matinko  
**Cc:** Laura Rusmisl; Melissa Shaughnessy; Leagha Courtney  
**Subject:** Well Record - BIRD RUN 4H  
**Attachments:** WR BIRD RUN 10938 4H Final.pdf

Good Morning,

The well record for the **BIRD RUN 4H** is attached and has been submitted to the DEP via Greenport today; eSubmission confirmation below:

 PA GOV OFFICIAL APP

Josh Shapiro, Governor

Jessica Shire

### eSubmission

---

*Submission details:*

**Submission:** Well Record (Unconventional - non-vertical well)  
**Submitted:** 5/27/2025 11:00:06 AM  
**Status:** Submitted  
**County:** Washington  
**Municipality:** Chartiers Township  
**Region:** EP DOGO SWDO Dstr Off  
**Primary\_Facility\_Id:** 880726  
**WellAPI:** 125-29188  
**User:** HICKSJN  
**Operator:** 60915 - RANGE RESOURCES APPALACHIA LLC

*Files attached:*

File	Document_Type	Description
<a href="#">WR BIRD RUN 10938 4H Final.pdf</a>	Well Record	(Unconventional)

Thank you,

**Jason Hicks**

Drilling Engineering Tech II

Office: 724.743.5232 -- Cell: 724.993.7173

Email: [jhicks@rangeresources.com](mailto:jhicks@rangeresources.com)

Range Resources-Appalachia, LLC

3000 Town Center Boulevard

Canonsburg, PA 15317

[www.rangeresources.com](http://www.rangeresources.com)

 RANGE RESOURCES®