

TABLE 1
FORMER HOWARD 14-18 WELLHEAD AND TANK BATTERY COMBINED
SOIL ANALYTICAL RESULTS SUMMARY TABLE
ORGANIC COMPOUNDS

Sample ID	Date Sampled	Depth	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	1, 2, 4-TMB (mg/kg)	1, 3, 5-TMB (mg/kg)	Naphthalene (mg/kg)	TPH ⁽⁴⁾ (mg/kg)
Residential SSL^(1,2)			1.2	490	5.8	58	30	27	2	500
Protection of Groundwater SSL^(1,2,3)			0.0026	0.69	0.78	9.9	0.0081	0.0087	0.0038	500
WH01-B @ 8'	3/15/2023	8 ft. bgs	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<50
WH01-N @ 4'	3/15/2023	4 ft. bgs	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<50
PWV01-B @ 4'	3/15/2023	4 ft. bgs	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<50
PWV01-N @ 2.5'	3/15/2023	2.5 ft. bgs	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<50
SEP01-FL @ 4'	3/15/2023	4 ft. bgs	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<50
SEP01-DL @ 4'	3/15/2023	4 ft. bgs	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<50
AST01 @ 0-6"	3/15/2023	0-6 in. bgs	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<50

Notes:

1. Compounds referenced from the ECMC 2 CCR 404-1, Table 915-1, effective January 15, 2021.
2. Soil Screening Levels (SSL) referenced from EPA Regional Screening Levels (EPA RSLs) for Chemical Contaminants at Superfund Sites, effective November 2020.
3. SSLs are applicable if a pathway for communication with groundwater is present.
4. Value calculated by adding TVPH-GRO, TEPH-DRO, and TEPH-ORO concentrations.

ECMC = Colorado Energy & Carbon Management Commission

(<) = Analytical result is less than the indicated laboratory reporting limit.

TVPH-GRO = Total volatile petroleum hydrocarbons - gasoline range organics

TEPH-DRO = Total extractable petroleum hydrocarbons - diesel range organics

TEPH-ORO = Total extractable petroleum hydrocarbons - oil range organics

mg/kg = Milligrams per kilogram

TMB = Trimethylbenzene

ft. = Feet

in. = Inches

bgs = Below ground surface

TABLE 2
FORMER HOWARD 14-18 WELLHEAD AND TANK BATTERY COMBINED
SOIL ANALYTICAL RESULTS SUMMARY TABLE
INORGANIC COMPOUNDS

Sample ID	Date Sampled	Depth	pH (units)	EC (mmhos/cm)	SAR (units)	Boron (mg/L)
Soil Suitability for Reclamation Standard ⁽¹⁾			6-8.3	<4	<6	2
WH01-B @ 8'	3/15/2023	8 ft. bgs	8.06	0.314	0.910	0.0789
WH01-N @ 4'	3/15/2023	4 ft. bgs	7.71	0.482	1.12	0.126
WH01-N @ 2.5'	3/15/2023	2.5 ft. bgs	7.71	0.0797	0.362	0.0206
PWV01-B @ 4'	3/15/2023	4 ft. bgs	7.96	0.160	0.285	0.0500
PWV01-N @ 2.5'	3/15/2023	2.5 ft. bgs	7.65	0.154	0.176	0.0321

Notes:

1. Compounds referenced from the ECMC 2 CCR 404-1, Table 915-1, effective January 15, 2021.

ECMC = Colorado Energy & Carbon Management Commission

EC = Electrical conductivity

SAR = Sodium adsorption ratio

mmhos/cm = millimhos per centimeter

mg/L = milligram per liter

ft. = Feet

bgs = Below ground surface

TABLE 3
FORMER HOWARD 14-18 WELLHEAD AND TANK BATTERY COMBINED
SOIL ANALYTICAL RESULTS SUMMARY TABLE
ORGANIC COMPOUNDS - PAHs

Sample ID	Date Sampled	Depth	Acenaphthene (mg/kg)	Anthracene (mg/kg)	Benz(a) (mg/kg)	Benzo(a) (mg/kg)	Benzo(b) (mg/kg)	Benzo(k) (mg/kg)	Chrysene (mg/kg)	A,H (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	1,2,3-CD (mg/kg)	Pyrene (mg/kg)	1-M (mg/kg)	2-M (mg/kg)
Residential SSL ^(1,2)			360	1,800	1.1	0.11	1.1	11	110	0.11	240	240	1.1	180	18	24
Protection of Groundwater SSL ^(1,2,3)			0.55	5.8	0.011	0.24	0.3	2.9	9	0.096	8.9	0.54	0.98	1.3	0.006	0.019
WH01-B @ 8'	3/15/2023	8 ft. bgs	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	0.00783	<0.00500	<0.00500	0.00616	<0.00500	<0.00500
WH01-N @ 4'	3/15/2023	4 ft. bgs	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500

Notes:

1. Compounds referenced from the ECOM 2 CCR 404-1, Table 915-1, effective January 15, 2021.
2. Soil Screening Levels (SSL) referenced from EPA Regional Screening Levels (EPA RSLs) for Chemical Contaminants at Superfund Sites, effective November 2020.
3. SSLs are applicable if a pathway for communication with groundwater is present.

ECMC = Colorado Energy & Carbon Management Commission

(<) = Analytical result is less than the indicated laboratory reporting limit.

PAHs = Polycyclic aromatic hydrocarbons

Benzo(a) = Benzoanthracene

Benzo(a) = Benzopyrene

Benzo(b) = Benzo(a)fluoranthene

Benzo(k) = Benzo(a)fluoranthene

A,H = Dibenzoanthracene

1,2,3-CD = Indeno(1,2,3-cd)pyrene

M = Methylanthracene

mg/kg = Milligrams per kilogram

ft. = Feet

in. = Inches

bgs = Below ground surface

**TABLE 4
FORMER HOWARD 14-18 WELLHEAD AND TANK BATTERY COMBINED
SOIL ANALYTICAL RESULTS SUMMARY TABLE
METALS**

Sample ID	Date Sampled	Depth	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium (VI) (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Zinc (mg/kg)
Residential SSL^(1,2)			0.68	15,000	71	0.3	3,100	400	1,500	390	390	23,000
Protection of Groundwater SSL^(1,2,3)			0.29	82	0.38	0.00067	46	14	26	0.26	0.8	370
WH01-B @ 8'	3/15/2023	8 ft. bgs	0.987	22.0	0.0903	<0.30 ⁽⁴⁾	2.76	3.30	1.84	<0.175	0.0253	9.06
WH01-N @ 4'	3/15/2023	4 ft. bgs	2.64	57.3	0.297	<0.30 ⁽⁴⁾	7.16	10.9	3.61	<0.175	0.0874	23.4
WH01-S @ 4'	3/15/2023	4 ft. bgs	2.26	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB01 @ 8.5'	10/10/2023	8.5 ft. bgs	0.494	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB02 @ 5'	10/10/2023	5 ft. bgs	0.707	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB02 @ 6'	10/10/2023	6 ft. bgs	0.690	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB02 @ 7'	10/10/2023	7 ft. bgs	0.498	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB03 @ 5'	10/10/2023	5 ft. bgs	1.77	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB03 @ 6'	10/10/2023	6 ft. bgs	1.54	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB03 @ 7'	10/10/2023	7 ft. bgs	0.674	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB04 @ 5'	10/10/2023	5 ft. bgs	0.737	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB04 @ 6'	10/10/2023	6 ft. bgs	0.629	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB04 @ 8'	10/10/2023	8 ft. bgs	0.309	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB04 @ 9'	10/10/2023	9 ft. bgs	0.255	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB05 @ 5'	10/10/2023	5 ft. bgs	0.999	NA	NA	NA	NA	NA	NA	NA	NA	NA
BKG01 @ 2.5'	3/15/2023	2.5 ft. bgs	0.600	45.4	0.114	<0.30 ⁽⁴⁾	1.97	1.75	2.53	<0.175	0.0191	6.39
BKG01 @ 4'	3/15/2023	4 ft. bgs	0.976	44.2	0.0817	<0.30 ⁽⁴⁾	1.48	1.76	1.46	<0.175	0.00691	5.59
BKG01 @ 8'	3/15/2023	8 ft. bgs	0.709	37.9	0.0682	<0.30 ⁽⁴⁾	1.48	1.47	1.26	<0.175	0.00694	4.81
BKG02 @ 2.5'	10/10/2023	2.5 ft. bgs	1.10	NA	NA	NA	NA	NA	NA	NA	NA	NA
BKG02 @ 5'	10/10/2023	5 ft. bgs	0.391	NA	NA	NA	NA	NA	NA	NA	NA	NA
BKG02 @ 6'	10/10/2023	6 ft. bgs	0.238	NA	NA	NA	NA	NA	NA	NA	NA	NA
BKG02 @ 8'	10/10/2023	8 ft. bgs	0.329	NA	NA	NA	NA	NA	NA	NA	NA	NA
BKG02 @ 9'	10/10/2023	9 ft. bgs	0.362	NA	NA	NA	NA	NA	NA	NA	NA	NA
BKG02 @ 10'	10/10/2023	10 ft. bgs	0.495	NA	NA	NA	NA	NA	NA	NA	NA	NA
BKG03 @ 2.5'	10/10/2023	2.5 ft. bgs	<0.200	NA	NA	NA	NA	NA	NA	NA	NA	NA
BKG03 @ 5'	10/10/2023	5 ft. bgs	0.310	NA	NA	NA	NA	NA	NA	NA	NA	NA
BKG03 @ 6'	10/10/2023	6 ft. bgs	0.347	NA	NA	NA	NA	NA	NA	NA	NA	NA
BKG03 @ 8'	10/10/2023	8 ft. bgs	0.328	NA	NA	NA	NA	NA	NA	NA	NA	NA
BKG03 @ 9'	10/10/2023	9 ft. bgs	0.244	NA	NA	NA	NA	NA	NA	NA	NA	NA
BKG03 @ 10'	10/10/2023	10 ft. bgs	0.326	NA	NA	NA	NA	NA	NA	NA	NA	NA
BKG04 @ 2.5'	10/10/2023	2.5 ft. bgs	0.369	NA	NA	NA	NA	NA	NA	NA	NA	NA
BKG04 @ 5'	10/10/2023	5 ft. bgs	0.214	NA	NA	NA	NA	NA	NA	NA	NA	NA
BKG04 @ 6'	10/10/2023	6 ft. bgs	0.268	NA	NA	NA	NA	NA	NA	NA	NA	NA
BKG04 @ 8'	10/10/2023	8 ft. bgs	<0.200	NA	NA	NA	NA	NA	NA	NA	NA	NA
BKG04 @ 9'	10/10/2023	9 ft. bgs	<0.200	NA	NA	NA	NA	NA	NA	NA	NA	NA
BKG04 @ 10'	10/10/2023	10 ft. bgs	0.213	NA	NA	NA	NA	NA	NA	NA	NA	NA
BKG05 @ 2.5'	10/10/2023	2.5 ft. bgs	0.549	NA	NA	NA	NA	NA	NA	NA	NA	NA
BKG05 @ 5'	10/10/2023	5 ft. bgs	0.280	NA	NA	NA	NA	NA	NA	NA	NA	NA
BKG05 @ 6'	10/10/2023	6 ft. bgs	<0.200	NA	NA	NA	NA	NA	NA	NA	NA	NA
BKG05 @ 8'	10/10/2023	8 ft. bgs	0.915	NA	NA	NA	NA	NA	NA	NA	NA	NA
BKG05 @ 9'	10/10/2023	9 ft. bgs	1.36	NA	NA	NA	NA	NA	NA	NA	NA	NA
BKG05 @ 10'	10/10/2023	10 ft. bgs	0.561	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mean Background Concentration⁽⁵⁾			0.455	42.5	0.0880	0.30	1.64	1.66	1.75	0.175	0.01098	5.60
1.25x Mean Background Concentration			0.569	53.1	0.1100	0.38	2.05	2.08	2.19	0.219	0.01373	7.00
Mean Background Concentration at 5 ft. bgs⁽⁵⁾			0.299	-	-	-	-	-	-	-	-	-
1.25x Mean Background Concentration at 5 ft. bgs			0.373	-	-	-	-	-	-	-	-	-
Mean Background Concentration at 6 ft. bgs⁽⁵⁾			0.263	-	-	-	-	-	-	-	-	-
1.25x Mean Background Concentration at 6 ft. bgs			0.329	-	-	-	-	-	-	-	-	-
Peak Background Concentration 2.5 ft. bgs - 9 ft. bgs⁽⁶⁾			1.36	-	-	-	-	-	-	-	-	-
1.25x Peak Background Concentration 2.5 ft bgs - 9 ft. bgs			1.70	-	-	-	-	-	-	-	-	-

Notes:

- Compounds referenced from the ECOM 2 CCR 404-1, Table 915-1, effective January 15, 2021.
 - Soil Screening Levels (SSL) referenced from EPA Regional Screening Levels (EPA RSLs) for Chemical Contaminants at Superfund Sites, effective November 2020.
 - SSLs are applicable if a pathway for communication with groundwater is present.
 - Compound falls within COGCC Table 915-1 Footnote 9.
 - Non-detect background results accounted for in the mean background concentration by using the detection limit, where applicable.
 - Excavation extent and site investigation samples collected from 4' - 9' bgs compared with peak native material soils collected between 2.5' - 9' bgs due to similar lithologies.
- ECMC = Colorado Energy & Carbon Management Commission
(<) = Analytical result is less than the indicated laboratory reporting limit.
mg/kg = Milligrams per kilogram
ft. = Feet
in. = Inches
NA = Constituent not analyzed
bgs = Below ground surface
BOLD = Analytical result is in exceedance of applicable standard.
BOLD = Analytical result is in exceedance of applicable standard, but within 1.25x mean background concentrations.

**TABLE 5
FORMER HOWARD 14-18 WELLHEAD AND TANK BATTERY COMBINED
FIELD DATA SUMMARY TABLE**

Sample ID	Date Sampled	Depth	GPS Data ⁽¹⁾		PDOP Value	VOC Concentration ⁽²⁾ (ppm)
			Latitude	Longitude		
WH01-B @ 8'	3/15/2023	8 ft. bgs	40.393496	-104.600117	NC	8.6
WH01-N @ 4'	3/15/2023	4 ft. bgs	40.393519	-104.600121	1.1	4.2
WH01-W @ 4'	3/15/2023	4 ft. bgs	40.393490	-104.600150	0.9	0.1
WH01-S @ 4'	3/15/2023	4 ft. bgs	40.393478	-104.600119	1.0	0.6
WH01-E @ 4'	3/15/2023	4 ft. bgs	40.393497	-104.600098	1.0	0.1
WH01-N @ 2.5'	3/15/2023	2.5 ft. bgs	40.393519	-104.600121	1.1	1.9
WHS01-N @ 0-6"	3/15/2023	0-6 in. bgs	40.393581	-104.600084	0.9	0.1
WHS01-W @ 0-6"	3/15/2023	0-6 in. bgs	40.393482	-104.600182	0.9	0.4
WHS01-S @ 0-6"	3/15/2023	0-6 in. bgs	40.393448	-104.600171	1.0	0.9
WHS01-E @ 0-6"	3/15/2023	0-6 in. bgs	40.393477	-104.600037	0.9	0.1
AST01 @ 0-6"	3/15/2023	0-6 in. bgs	40.393594	-104.600560	1.0	0.7
MH01 @ 0-6"	3/15/2023	0-6 in. bgs	40.393315	-104.600549	0.9	0.2
PWV01-B @ 4'	3/15/2023	4 ft. bgs	40.393548	-104.600533	1.0	0.4
PWV01-N @ 2.5'	3/15/2023	2.5 ft. bgs	40.393561	-104.600534	1.0	0.3
PWV01-W @ 2.5'	3/15/2023	2.5 ft. bgs	40.393537	-104.600558	1.0	0.3
PWV01-S @ 2.5'	3/15/2023	2.5 ft. bgs	40.393525	-104.600542	1.0	0.1
PWV01-E @ 2.5'	3/15/2023	2.5 ft. bgs	40.393539	-104.600510	1.0	0.2
WDL01 @ 3'	3/15/2023	3 ft. bgs	40.393560	-104.600536	1.0	0.2
SEP01-FL @ 4'	3/15/2023	4 ft. bgs	40.393322	-104.600495	1.0	0.4
SEP01-DL @ 4'	3/15/2023	4 ft. bgs	40.393367	-104.600527	1.0	0.1
SB01 @ 8.5'	10/10/2023	8.5 ft. bgs	40.393493	-104.600119	NC	0.9
SB02 @ 5'	10/10/2023	5 ft. bgs	40.393541	-104.600121	NC	0.7
SB02 @ 6'	10/10/2023	6 ft. bgs	40.393541	-104.600121	NC	1.1
SB02 @ 7'	10/10/2023	7 ft. bgs	40.393541	-104.600121	NC	1.4
SB03 @ 5'	10/10/2023	5 ft. bgs	40.393494	-104.600182	NC	0.3
SB03 @ 6'	10/10/2023	6 ft. bgs	40.393494	-104.600182	NC	0.4
SB03 @ 7'	10/10/2023	7 ft. bgs	40.393494	-104.600182	NC	0.2
SB04 @ 5'	10/10/2023	5 ft. bgs	40.393458	-104.600119	NC	0.6
SB04 @ 6'	10/10/2023	6 ft. bgs	40.393458	-104.600119	NC	0.7
SB04 @ 8'	10/10/2023	8 ft. bgs	40.393458	-104.600119	NC	0.7
SB04 @ 9'	10/10/2023	9 ft. bgs	40.393458	-104.600119	NC	0.7
SB05 @ 5'	10/10/2023	5 ft. bgs	40.393492	-104.600071	NC	0.8
BKG01 @ 2.5'	3/15/2023	2.5 ft. bgs	40.393758	-104.600270	0.9	0.0
BKG01 @ 4'	3/15/2023	4 ft. bgs	40.393758	-104.600270	0.9	0.1
BKG01 @ 8'	3/15/2023	8 ft. bgs	40.393758	-104.600270	0.9	0.1
BKG02 @ 2.5'	10/10/2023	2.5 ft. bgs	40.393777	-104.600115	NC	0.3
BKG02 @ 5'	10/10/2023	5 ft. bgs	40.393777	-104.600115	NC	0.3
BKG02 @ 6'	10/10/2023	6 ft. bgs	40.393777	-104.600115	NC	0.2
BKG02 @ 8'	10/10/2023	8 ft. bgs	40.393777	-104.600115	NC	0.5
BKG02 @ 9'	10/10/2023	9 ft. bgs	40.393777	-104.600115	NC	0.6
BKG02 @ 10'	10/10/2023	10 ft. bgs	40.393777	-104.600115	NC	0.5

TABLE 5
FORMER HOWARD 14-18 WELLHEAD AND TANK BATTERY COMBINED
FIELD DATA SUMMARY TABLE

Sample ID	Date Sampled	Depth	GPS Data ⁽¹⁾		PDOP Value	VOC Concentration ⁽²⁾ (ppm)
			Latitude	Longitude		
BKG03 @ 2.5'	10/10/2023	2.5 ft. bgs	40.393776	-104.599964	NC	0.4
BKG03 @ 5'	10/10/2023	5 ft. bgs	40.393776	-104.599964	NC	0.3
BKG03 @ 6'	10/10/2023	6 ft. bgs	40.393776	-104.599964	NC	0.3
BKG03 @ 8'	10/10/2023	8 ft. bgs	40.393776	-104.599964	NC	0.5
BKG03 @ 9'	10/10/2023	9 ft. bgs	40.393776	-104.599964	NC	0.6
BKG03 @ 10'	10/10/2023	10 ft. bgs	40.393776	-104.599964	NC	0.6
BKG04 @ 2.5'	10/10/2023	2.5 ft. bgs	40.393758	-104.599748	NC	0.2
BKG04 @ 5'	10/10/2023	5 ft. bgs	40.393758	-104.599748	NC	0.1
BKG04 @ 6'	10/10/2023	6 ft. bgs	40.393758	-104.599748	NC	0.1
BKG04 @ 8'	10/10/2023	8 ft. bgs	40.393758	-104.599748	NC	0.3
BKG04 @ 9'	10/10/2023	9 ft. bgs	40.393758	-104.599748	NC	0.3
BKG04 @ 10'	10/10/2023	10 ft. bgs	40.393758	-104.599748	NC	0.3
BKG05 @ 2.5'	10/10/2023	2.5 ft. bgs	40.393525	-104.599756	NC	0.5
BKG05 @ 5'	10/10/2023	5 ft. bgs	40.393525	-104.599756	NC	0.7
BKG05 @ 6'	10/10/2023	6 ft. bgs	40.393525	-104.599756	NC	0.7
BKG05 @ 8'	10/10/2023	8 ft. bgs	40.393525	-104.599756	NC	1.1
BKG05 @ 9'	10/10/2023	9 ft. bgs	40.393525	-104.599756	NC	1.0
BKG05 @ 10'	10/10/2023	10 ft. bgs	40.393525	-104.599756	NC	0.9

Notes:

1. Global Positioning System (GPS) data is provided in decimal degrees using World Geodetic System (WGS) 84 UTM Zone 13 North.

2. Volatile organic compound (VOC) concentrations are measured in the field using a photoionization detector (PID).

PDOP = Position Dilution of Precision

ppm = Parts per million

ft. = Feet

in. = Inches

bgs = Below ground surface

NC = Data not collected

ATTACHMENT A

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

March 24, 2023

Mark Longhurst

PDC Energy

1775 Sherman St. STE. 3000

Denver, CO 80203

RE: Howard 14-18 Tank Battery

Work Order #2303420

Enclosed are the results of analyses for samples received by Summit Scientific on 03/15/23 18:18. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in blue ink, appearing to read "Scott Sheely".

Scott Sheely For Paul Shrewsbury

President



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Howard 14-18 Tank Battery

Project Number: [none]

Project Manager: Mark Longhurst

Reported:
03/24/23 13:17

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
PWV01-B@4'	2303420-01	Soil	03/15/23 11:00	03/15/23 18:18
PWV01-N@2.5'	2303420-02	Soil	03/15/23 11:02	03/15/23 18:18
SEP01-FL@4'	2303420-06	Soil	03/15/23 13:12	03/15/23 18:18
SEP01-DL@4'	2303420-07	Soil	03/15/23 13:15	03/15/23 18:18
AST01@0-6"	2303420-08	Soil	03/15/23 13:23	03/15/23 18:18

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

S₂

Sample Receipt Checklist

S2 Work Order# 2303420

Client: Draftsman Client Project ID: Howard 14-18 Tank Battery

Shipped Via: H.D./P.U./FedEx/UPS/USPS/Other Airbill #:

Matrix (Check all that apply) Air Soil/Solid Water Other

Temp (°C) Thermometer #

	Yes	No	N/A	Comments (if any)
If samples require cooling, is the temperature < 6°C? ⁽¹⁾ NOTE: If samples are delivered the same day of sampling, this requirement is met if there is evidence that cooling has begun.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>on ICE</u>
If custody seals are present, are they intact? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are samples due within 48 hours present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Are water samples with short hold times present? Note the short hold analysis in the comments column - pH, Nitrate/Nitrite, Ferrous Iron (Fe ²⁺), Hexavalent Chromium (Cr ⁶⁺ , Cr VI), COD/BOD, Total Coliform, E. Coli, Total Residual Chlorine (TRC), Dissolved Oxygen	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Is a chain-of-custody (COC) form present and filled out Completely? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client w/ date and time recorded? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all samples received intact? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling)? ⁽¹⁾ Note the type of preservative in the comments column – HCl, H ₂ SO ₄ , NaOH, HNO ₃ , etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If samples are acid preserved for metals, is the pH ≤ 2? ⁽¹⁾ Record the pH in Comments.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If dissolved metals are requested, were samples field filtered?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Additional Comments (if any):

⁽¹⁾ If NO, then contact the client before proceeding with analysis and note in case narrative.

[Signature]
Custodian Printed Name

3-15-23
Date/Time



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Howard 14-18 Tank Battery

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
03/24/23 13:17

PWV01-B@4'
2303420-01 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/15/23 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	BGC0571	03/18/23	03/22/23	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
Naphthalene	ND	0.0038	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **03/15/23 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	0.0567	142 %	50-150		"	"	"	"	
Surrogate: Toluene-d8	0.0394	98.6 %	50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0411	103 %	50-150		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **03/15/23 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	BGC0574	03/18/23	03/20/23	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **03/15/23 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl	9.57	76.6 %	30-150		"	"	"	"	

Total Metals by EPA 6020B Hot Water Soluble Extraction

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Howard 14-18 Tank Battery

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
03/24/23 13:17

PWV01-B@4'
2303420-01 (Soil)

Summit Scientific

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **03/15/23 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	0.0500	0.0100	mg/L	1	BGC0653	03/20/23	03/22/23	EPA 6020B	

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Date Sampled: **03/15/23 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	14.6	0.0516	mg/L dry	1	BGC0628	03/20/23	03/21/23	EPA 6020B	
Magnesium	6.68	0.0516	"	"	"	"	"	"	
Sodium	5.24	0.0516	"	"	"	"	"	"	

Calculated Analysis

Date Sampled: **03/15/23 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.285	0.00100	units	1	BGC0816	03/24/23	03/24/23	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **03/15/23 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	96.9		%	1	BGC0714	03/21/23	03/23/23	Calculation	

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **03/15/23 11:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.160	0.0100	mmhos/cm	1	BGC0665	03/21/23	03/21/23	EPA 120.1	

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Howard 14-18 Tank Battery

Project Number: [none]

Project Manager: Mark Longhurst

Reported:
 03/24/23 13:17

PWV01-B@4'
2303420-01 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction

Date Sampled: **03/15/23 11:00**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
pH	7.96			pH Units	1	BGC0666	03/21/23	03/21/23	EPA 9045D	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.





PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Howard 14-18 Tank Battery

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
03/24/23 13:17

PWV01-N@2.5'
2303420-02 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/15/23 11:02**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	BGC0571	03/18/23	03/22/23	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
Naphthalene	ND	0.0038	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **03/15/23 11:02**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	0.0541	135 %	50-150		"	"	"	"	
Surrogate: Toluene-d8	0.0380	95.0 %	50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0413	103 %	50-150		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **03/15/23 11:02**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	BGC0574	03/18/23	03/20/23	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **03/15/23 11:02**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl	9.26	74.1 %	30-150		"	"	"	"	

Total Metals by EPA 6020B Hot Water Soluble Extraction

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Howard 14-18 Tank Battery

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
03/24/23 13:17

PWV01-N@2.5'
2303420-02 (Soil)

Summit Scientific

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **03/15/23 11:02**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	0.0321	0.0100	mg/L	1	BGC0653	03/20/23	03/22/23	EPA 6020B	

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Date Sampled: **03/15/23 11:02**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	12.3	0.0509	mg/L dry	1	BGC0628	03/20/23	03/21/23	EPA 6020B	
Magnesium	6.05	0.0509	"	"	"	"	"	"	
Sodium	3.01	0.0509	"	"	"	"	"	"	

Calculated Analysis

Date Sampled: **03/15/23 11:02**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.176	0.00100	units	1	BGC0816	03/24/23	03/24/23	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **03/15/23 11:02**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	98.2		%	1	BGC0714	03/21/23	03/23/23	Calculation	

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **03/15/23 11:02**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.154	0.0100	mmhos/cm	1	BGC0665	03/21/23	03/21/23	EPA 120.1	

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Howard 14-18 Tank Battery

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 03/24/23 13:17

PWV01-N@2.5'
2303420-02 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction

Date Sampled: **03/15/23 11:02**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
pH	7.65		pH Units	1	BGC0666	03/21/23	03/21/23	EPA 9045D	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.





PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Howard 14-18 Tank Battery

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
03/24/23 13:17

SEP01-FL@4'
2303420-06 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/15/23 13:12**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	0.0020		mg/kg	1	BGC0571	03/18/23	03/22/23	EPA 8260B	
Toluene	ND	0.0050		"	"	"	"	"	"	
Ethylbenzene	ND	0.0050		"	"	"	"	"	"	
Xylenes (total)	ND	0.010		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050		"	"	"	"	"	"	
Naphthalene	ND	0.0038		"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50		"	"	"	"	"	"	

Date Sampled: **03/15/23 13:12**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4	0.0540	135 %		50-150		"	"	"	"	
Surrogate: Toluene-d8	0.0386	96.4 %		50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0423	106 %		50-150		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **03/15/23 13:12**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
C10-C28 (DRO)	ND	50		mg/kg	1	BGC0574	03/18/23	03/20/23	EPA 8015M	
C28-C36 (ORO)	ND	50		"	"	"	"	"	"	

Date Sampled: **03/15/23 13:12**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: o-Terphenyl	9.29	74.3 %		30-150		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Howard 14-18 Tank Battery

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
03/24/23 13:17

SEP01-DL@4'
2303420-07 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/15/23 13:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	BGC0571	03/18/23	03/22/23	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.010	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050	"	"	"	"	"	"	
Naphthalene	ND	0.0038	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **03/15/23 13:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	0.0565	141 %	50-150		"	"	"	"	
Surrogate: Toluene-d8	0.0380	95.1 %	50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0429	107 %	50-150		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **03/15/23 13:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	BGC0574	03/18/23	03/20/23	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **03/15/23 13:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl	9.48	75.9 %	30-150		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Howard 14-18 Tank Battery

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
03/24/23 13:17

AST01@0-6"
2303420-08 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/15/23 13:23**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	0.0020		mg/kg	1	BGC0571	03/18/23	03/22/23	EPA 8260B	
Toluene	ND	0.0050		"	"	"	"	"	"	
Ethylbenzene	ND	0.0050		"	"	"	"	"	"	
Xylenes (total)	ND	0.010		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050		"	"	"	"	"	"	
Naphthalene	ND	0.0038		"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50		"	"	"	"	"	"	

Date Sampled: **03/15/23 13:23**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4	0.0520	130 %		50-150		"	"	"	"	
Surrogate: Toluene-d8	0.0388	97.0 %		50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0409	102 %		50-150		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **03/15/23 13:23**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
C10-C28 (DRO)	ND	50		mg/kg	1	BGC0574	03/18/23	03/20/23	EPA 8015M	
C28-C36 (ORO)	ND	50		"	"	"	"	"	"	

Date Sampled: **03/15/23 13:23**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: o-Terphenyl	9.58	76.7 %		30-150		"	"	"	"	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Howard 14-18 Tank Battery

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
03/24/23 13:17

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

Analyte	Result	Reporting		Spike Level	Source		%REC		RPD		Notes
		Limit	Units		Result	%REC	Limits	RPD	Limit		

Batch BGC0571 - EPA 5030 Soil MS

Blank (BGC0571-BLK1)

Prepared: 03/18/23 Analyzed: 03/21/23

Benzene	ND	0.0020	mg/kg								
Toluene	ND	0.0050	"								
Ethylbenzene	ND	0.0050	"								
Xylenes (total)	ND	0.010	"								
1,2,4-Trimethylbenzene	ND	0.0050	"								
1,3,5-Trimethylbenzene	ND	0.0050	"								
Naphthalene	ND	0.0038	"								
Gasoline Range Hydrocarbons	ND	0.50	"								
<i>Surrogate: 1,2-Dichloroethane-d4</i>	0.0492		"	0.0400		123	50-150				
<i>Surrogate: Toluene-d8</i>	0.0385		"	0.0400		96.2	50-150				
<i>Surrogate: 4-Bromofluorobenzene</i>	0.0400		"	0.0400		100	50-150				

LCS (BGC0571-BS1)

Prepared: 03/18/23 Analyzed: 03/21/23

Benzene	0.0838	0.0020	mg/kg	0.100		83.8	70-130				
Toluene	0.0724	0.0050	"	0.100		72.4	70-130				
Ethylbenzene	0.0908	0.0050	"	0.100		90.8	70-130				
m,p-Xylene	0.186	0.010	"	0.200		92.8	70-130				
o-Xylene	0.0883	0.0050	"	0.100		88.3	70-130				
1,2,4-Trimethylbenzene	0.0841	0.0050	"	0.100		84.1	70-130				
1,3,5-Trimethylbenzene	0.0876	0.0050	"	0.100		87.6	70-130				
Naphthalene	0.0771	0.0038	"	0.100		77.1	70-130				
<i>Surrogate: 1,2-Dichloroethane-d4</i>	0.0433		"	0.0400		108	50-150				
<i>Surrogate: Toluene-d8</i>	0.0365		"	0.0400		91.2	50-150				
<i>Surrogate: 4-Bromofluorobenzene</i>	0.0416		"	0.0400		104	50-150				

Matrix Spike (BGC0571-MS1)

Source: 2303418-01

Prepared: 03/18/23 Analyzed: 03/21/23

Benzene	0.0798	0.0020	mg/kg	0.100	ND	79.8	70-130				
Toluene	0.0710	0.0050	"	0.100	ND	71.0	70-130				
Ethylbenzene	0.0861	0.0050	"	0.100	ND	86.1	70-130				
m,p-Xylene	0.178	0.010	"	0.200	ND	89.1	70-130				
o-Xylene	0.0884	0.0050	"	0.100	ND	88.4	70-130				
1,2,4-Trimethylbenzene	0.0850	0.0050	"	0.100	ND	85.0	70-130				
1,3,5-Trimethylbenzene	0.0874	0.0050	"	0.100	ND	87.4	70-130				
Naphthalene	0.0805	0.0038	"	0.100	ND	80.5	70-130				
<i>Surrogate: 1,2-Dichloroethane-d4</i>	0.0434		"	0.0400		109	50-150				
<i>Surrogate: Toluene-d8</i>	0.0386		"	0.0400		96.4	50-150				
<i>Surrogate: 4-Bromofluorobenzene</i>	0.0425		"	0.0400		106	50-150				

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Howard 14-18 Tank Battery

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 03/24/23 13:17

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

Analyte	Result	Reporting		Spike Level	Source Result	%REC		RPD		Notes
		Limit	Units			%REC	Limits	RPD	Limit	

Batch BGC0571 - EPA 5030 Soil MS

Matrix Spike Dup (BGC0571-MSD1)	Source: 2303418-01			Prepared: 03/18/23 Analyzed: 03/21/23					
Benzene	0.0849	0.0020	mg/kg	0.100	ND	84.9	70-130	6.27	30
Toluene	0.0770	0.0050	"	0.100	ND	77.0	70-130	8.19	30
Ethylbenzene	0.0904	0.0050	"	0.100	ND	90.4	70-130	4.86	30
m,p-Xylene	0.182	0.010	"	0.200	ND	91.1	70-130	2.28	30
o-Xylene	0.0867	0.0050	"	0.100	ND	86.7	70-130	1.95	30
1,2,4-Trimethylbenzene	0.0806	0.0050	"	0.100	ND	80.6	70-130	5.43	30
1,3,5-Trimethylbenzene	0.0865	0.0050	"	0.100	ND	86.5	70-130	1.14	30
Naphthalene	0.0793	0.0038	"	0.100	ND	79.3	70-130	1.58	30
Surrogate: 1,2-Dichloroethane-d4	0.0412		"	0.0400		103	50-150		
Surrogate: Toluene-d8	0.0386		"	0.0400		96.6	50-150		
Surrogate: 4-Bromofluorobenzene	0.0403		"	0.0400		101	50-150		

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Howard 14-18 Tank Battery

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
03/24/23 13:17

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

Analyte	Result	Reporting		Spike Level	Source		%REC		RPD		Notes
		Limit	Units		Result	%REC	Limits	RPD	Limit		

Batch BGC0574 - EPA 3550A

Blank (BGC0574-BLK1)

Prepared: 03/18/23 Analyzed: 03/20/23

C10-C28 (DRO)	ND	50	mg/kg								
C28-C36 (ORO)	ND	50	"								
Surrogate: <i>o</i> -Terphenyl	13.6		"	12.5	109	30-150					

LCS (BGC0574-BS1)

Prepared: 03/18/23 Analyzed: 03/20/23

C10-C28 (DRO)	356	50	mg/kg	500	71.1	70-130					
Surrogate: <i>o</i> -Terphenyl	13.4		"	12.5	107	30-150					

Matrix Spike (BGC0574-MS1)

Source: 2303418-01

Prepared: 03/18/23 Analyzed: 03/20/23

C10-C28 (DRO)	375	50	mg/kg	500	9.70	73.0	70-130				
Surrogate: <i>o</i> -Terphenyl	11.1		"	12.5	88.8	30-150					

Matrix Spike Dup (BGC0574-MSD1)

Source: 2303418-01

Prepared: 03/18/23 Analyzed: 03/20/23

C10-C28 (DRO)	386	50	mg/kg	500	9.70	75.3	70-130	3.03	20		
Surrogate: <i>o</i> -Terphenyl	10.6		"	12.5	85.1	30-150					

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Howard 14-18 Tank Battery

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 03/24/23 13:17

Total Metals by EPA 6020B Hot Water Soluble Extraction - Quality Control
Summit Scientific

Analyte	Result	Reporting		Spike Level	Source		%REC		RPD		Notes
		Limit	Units		Result	%REC	Limits	RPD	Limit		

Batch BGC0653 - EPA 3050B

Blank (BGC0653-BLK1)

Prepared: 03/20/23 Analyzed: 03/22/23

Boron ND 0.0100 mg/L

LCS (BGC0653-BS1)

Prepared: 03/20/23 Analyzed: 03/22/23

Boron 4.94 0.0100 mg/L 5.00 98.7 80-120

Duplicate (BGC0653-DUP1)

Source: 2303414-01

Prepared: 03/20/23 Analyzed: 03/22/23

Boron 0.162 0.0100 mg/L 0.165 1.71 20

Matrix Spike (BGC0653-MS1)

Source: 2303414-01

Prepared: 03/20/23 Analyzed: 03/22/23

Boron 5.29 0.0100 mg/L 5.00 0.165 102 75-125

Matrix Spike Dup (BGC0653-MSD1)

Source: 2303414-01

Prepared: 03/20/23 Analyzed: 03/22/23

Boron 5.17 0.0100 mg/L 5.00 0.165 100 75-125 2.30 25

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Howard 14-18 Tank Battery

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 03/24/23 13:17

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction - Quality Control

Summit Scientific

Analyte	Result	Reporting		Spike	Source	%REC		RPD		Notes
		Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

Batch BGC0628 - General Preparation

Blank (BGC0628-BLK1)

Prepared: 03/20/23 Analyzed: 03/21/23

Calcium	ND	0.0500	mg/L wet							
Magnesium	ND	0.0500	"							
Sodium	ND	0.0500	"							

LCS (BGC0628-BS1)

Prepared: 03/20/23 Analyzed: 03/21/23

Calcium	5.44	0.0500	mg/L wet	5.00		109	70-130			
Magnesium	5.24	0.0500	"	5.00		105	70-130			
Sodium	4.87	0.0500	"	5.00		97.4	70-130			

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Howard 14-18 Tank Battery

Project Number: [none]

Project Manager: Mark Longhurst

Reported:
 03/24/23 13:17

Physical Parameters by APHA/ASTM/EPA Methods - Quality Control

Summit Scientific

Analyte	Result	Reporting		Spike Level	Source		%REC		RPD		Notes
		Limit	Units		Result	%REC	Limits	RPD	Limit		

Batch BGC0714 - General Preparation

Duplicate (BGC0714-DUP1)

Source: 2303420-01

Prepared: 03/21/23 Analyzed: 03/23/23

% Solids	97.4		%		96.9			0.513		20	
----------	------	--	---	--	------	--	--	-------	--	----	--

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.





PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Howard 14-18 Tank Battery

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 03/24/23 13:17

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction - Quality Control

Summit Scientific

Analyte	Result	Reporting		Spike Level	Source		%REC		RPD		Notes
		Limit	Units		Result	%REC	Limits	RPD	Limit		

Batch BGC0665 - General Preparation

Blank (BGC0665-BLK1)

Prepared & Analyzed: 03/21/23

Specific Conductance (EC) ND 0.0100 mmhos/cm

LCS (BGC0665-BS1)

Prepared & Analyzed: 03/21/23

Specific Conductance (EC) 0.153 0.0100 mmhos/cm 0.150 102 95-105

Duplicate (BGC0665-DUP1)

Source: 2303359-01

Prepared & Analyzed: 03/21/23

Specific Conductance (EC) 1.21 0.0100 mmhos/cm 1.22 0.826 20

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Howard 14-18 Tank Battery

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 03/24/23 13:17

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction - Quality Control

Summit Scientific

Analyte	Result	Reporting		Spike	Source	%REC		RPD		Notes
		Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

Batch BGC0666 - General Preparation

LCS (BGC0666-BS1)

Prepared & Analyzed: 03/21/23

pH	9.16		pH Units	9.18		99.8	95-105			
----	------	--	----------	------	--	------	--------	--	--	--

Duplicate (BGC0666-DUP1)

Source: 2303359-01

Prepared & Analyzed: 03/21/23

pH	9.33		pH Units	9.33		0.00	20			
----	------	--	----------	------	--	------	----	--	--	--

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Howard 14-18 Tank Battery

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
03/24/23 13:17

Notes and Definitions

DET Analyte DETECTED
ND Analyte NOT DETECTED at or above the reporting limit
NR Not Reported
dry Sample results reported on a dry weight basis
RPD Relative Percent Difference

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80401

303.277.9310

April 03, 2023

Mark Longhurst

PDC Energy

1775 Sherman St. STE. 3000

Denver, CO 80203

RE: Howard 14-18 Wellhead

Work Order # 2303422

Enclosed are the results of analyses for samples received by Summit Scientific on 03/15/23 18:18. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Scott Sheely". The signature is written in a cursive style and is positioned above a faint, light-colored rectangular stamp or watermark.

Scott Sheely For Paul Shrewsbury

President



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/03/23 10:51

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WH01-B@8'	2303422-01	Soil	03/15/23 11:30	03/15/23 18:18
WH01-N@4'	2303422-02	Soil	03/15/23 10:40	03/15/23 18:18
WH01-S@4'	2303422-04	Soil	03/15/23 10:44	03/15/23 18:18
WH01-N@2.5'	2303422-06	Soil	03/15/23 10:52	03/15/23 18:18
BKG01@2.5'	2303422-07	Soil	03/15/23 12:00	03/15/23 18:18
BKG01@4'	2303422-08	Soil	03/15/23 12:05	03/15/23 18:18
BKG01@8'	2303422-09	Soil	03/15/23 12:10	03/15/23 18:18

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

SUMMIT SCIENTIFIC

4653 Table Mountain Drive
Golden, CO 80403
303-277-9310

Lab ID	Page 1 of 1
2303422	

Client: PDC / Tasman		Send Data To: Project Manager: Mark Longhurst		Send Invoice To: Company: PDC Energy	
Address: 6855 W 119th Ave		E-Mail: mark.longhurst@PDCE.com		Project Name/Location:	
City/State/Zip: Broomfield / CO / 80220		Project Name: Howard 14-18 Wellhead		AFE#:	
Phone: 303-487-1228		Project Number:		PO/Billing Codes:	
Sampler Name: David V. Jordan H.		Contact: Mark Longhurst			

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix		Air-Canister #	Other	Analysis Requested							Special Instructions	
					HCl	HNO3	None	Other	Water	Soil			BTEXN - 8260B	TPH - (C6 - C36)	1,2,4 & 1,3,5-TMB	Boron - HWS	pH, EC, SAR	PAH - 915	Metals - 915		
1	Wt61-B @ 8'	3/15/23	1130	2			X						X	X	X	X	X	X	X		
2	Wt61-N @ 4'		1040	2									X	X	X	X	X	X	X		
3	Wt61-W @ 4'		1042	2																X	
4	Wt61-S @ 4'		1044	2																X	
5	Wt61-E @ 4'		1046	2																X	
6	Wt61-N @ 2.5'		1052	1											X	X					
7	B/K G61 @ 2.5'		1200	1																X	
8	B/K G61 @ 4'		1205	1																X	
9	B/K G61 @ 8'		1210	1																X	
10																					
11																					
12																					
13																					
14																					
15																					

Relinquished by: <i>[Signature]</i>	Date/Time: 3/15/23 1600	Received by: Tasman lockbox	Date/Time: 3/15/23 1600	TAT Business Days	Field DO	Notes:
				Same Day	Field EC	
Relinquished by: Tasman lockbox	Date/Time: 3/15/23 1818	Received by: <i>[Signature]</i>	Date/Time: 3/15/23 1818	1 Day	Field ORP	
				2 Days	Field pH	
Relinquished by:	Date/Time:	Received by:	Date/Time:	3 Days	Field Temp.	
				Standard	Field Turb.	
Temperature Upon Receipt: 89	Corrected Temperature: <i>[Signature]</i>	IR gun #: 1	HNO3 lot #:			

S₂

Sample Receipt Checklist

S2 Work Order# 2303422

Client: Poc / Trsman Client Project ID: Howard 14-18 wellhead

Shipped Via: H.D./P.U./FedEx/UPS/USPS/Other Airbill #: _____

Matrix (Check all that apply) Air Soil/Solid Water Other

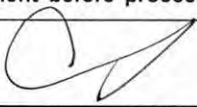
Temp (°C)

Thermometer #

	Yes	No	N/A	Comments (if any)
If samples require cooling, is the temperature < 6°C? ⁽¹⁾ NOTE: If samples are delivered the same day of sampling, this requirement is met if there is evidence that cooling has begun.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>on ICE</i>
If custody seals are present, are they intact? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are samples due within 48 hours present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Are water samples with short hold times present? Note the short hold analysis in the comments column - pH, Nitrate/Nitrite, Ferrous Iron (Fe ²⁺), Hexavalent Chromium (Cr ⁶⁺ , Cr VI), COD/BOD, Total Coliform, E. Coli, Total Residual Chlorine (TRC), Dissolved Oxygen	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Is a chain-of-custody (COC) form present and filled out Completely? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client w/ date and time recorded? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all samples received intact? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling)? ⁽¹⁾ Note the type of preservative in the comments column – HCl, H ₂ SO ₄ , NaOH, HNO ₃ , etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If samples are acid preserved for metals, is the pH ≤ 2? ⁽¹⁾ Record the pH in Comments.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If dissolved metals are requested, were samples field filtered?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Additional Comments (if any):

⁽¹⁾ If NO, then contact the client before proceeding with analysis and note in case narrative.


Custodian Printed Name

3-15-23
Date/Time



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/03/23 10:51

WH01-B@8'
2303422-01 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/15/23 11:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
Benzene	ND	0.0020		mg/kg	1	BGC0571	03/18/23	03/22/23	EPA 8260B	
Toluene	ND	0.0050		"	"	"	"	"	"	
Ethylbenzene	ND	0.0050		"	"	"	"	"	"	
Xylenes (total)	ND	0.010		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050		"	"	"	"	"	"	
Naphthalene	ND	0.0038		"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50		"	"	"	"	"	"	

Date Sampled: **03/15/23 11:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
Surrogate: 1,2-Dichloroethane-d4		141 %		50-150		"	"	"	"	
Surrogate: Toluene-d8		98.1 %		50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %		50-150		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **03/15/23 11:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
C10-C28 (DRO)	ND	50		mg/kg	1	BGC0574	03/18/23	03/20/23	EPA 8015M	
C28-C36 (ORO)	ND	50		"	"	"	"	"	"	

Date Sampled: **03/15/23 11:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
Surrogate: o-Terphenyl		72.8 %		30-150		"	"	"	"	

PAH by EPA Method 8270D SIM

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/03/23 10:51

WH01-B@8'
2303422-01 (Soil)

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **03/15/23 11:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
Acenaphthene	ND	0.00500		mg/kg	1	BGC0771	03/23/23	03/24/23	EPA 8270D SIM	
Anthracene	ND	0.00500		"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.00500		"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.00500		"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.00500		"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.00500		"	"	"	"	"	"	
Chrysene	ND	0.00500		"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.00500		"	"	"	"	"	"	
Fluoranthene	0.00783	0.00500		"	"	"	"	"	"	
Fluorene	ND	0.00500		"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.00500		"	"	"	"	"	"	
Pyrene	0.00616	0.00500		"	"	"	"	"	"	
1-Methylnaphthalene	ND	0.00500		"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.00500		"	"	"	"	"	"	

Date Sampled: **03/15/23 11:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
Surrogate: 2-Methylnaphthalene-d10		63.5 %		40-150		"	"	"	"	
Surrogate: Fluoranthene-d10		69.5 %		40-150		"	"	"	"	

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **03/15/23 11:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
Boron	0.0789	0.0100		mg/L	1	BGC0653	03/20/23	03/22/23	EPA 6020B	

Total Metals by EPA 6020B

Date Sampled: **03/15/23 11:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/03/23 10:51

WH01-B@8'
2303422-01 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Analyte	Result	Limit	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	0.987	0.207	0.175	mg/kg dry	1	BGC0678	03/21/23	03/22/23	EPA 6020B	
Barium	22.0	0.414	0.327	"	"	"	"	"	"	
Cadmium	0.0903	0.207	0.00746	"	"	"	"	"	"	
Copper	2.76	0.414	0.0216	"	"	"	"	"	"	
Lead	3.30	0.207	0.0569	"	"	"	"	"	"	
Nickel	1.84	0.414	0.0632	"	"	"	"	"	"	
Selenium	ND	0.260	0.175	"	"	"	"	"	"	
Silver	0.0253	0.0207	0.00277	"	"	"	"	"	"	
Zinc	9.06	0.414	0.276	"	"	"	"	"	"	

Hexavalent Chromium by EPA Method 7196

Date Sampled: 03/15/23 11:30

Analyte	Result	Reporting Limit	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	0.30		mg/kg dry	1	BGC0719	03/21/23	03/21/23	EPA 7196A	

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Date Sampled: 03/15/23 11:30

Analyte	Result	Reporting Limit	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	23.1	0.0518		mg/L dry	1	BGC0629	03/20/23	03/21/23	EPA 6020B	
Magnesium	7.73	0.0518		"	"	"	"	"	"	
Sodium	19.8	0.0518		"	"	"	"	"	"	

Calculated Analysis

Date Sampled: 03/15/23 11:30

Analyte	Result	Reporting Limit	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.910	0.00100		units	1	BGC0817	03/24/23	03/24/23	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Howard 14-18 Wellhead

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 04/03/23 10:51

WH01-B@8'
2303422-01 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **03/15/23 11:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
% Solids	96.5			%	1	BGC0714	03/21/23	03/23/23	Calculation	

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **03/15/23 11:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
Specific Conductance (EC)	0.314	0.0100		mmhos/cm	1	BGC0661	03/21/23	03/21/23	EPA 120.1	

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction

Date Sampled: **03/15/23 11:30**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
pH	8.06			pH Units	1	BGC0662	03/21/23	03/21/23	EPA 9045D	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/03/23 10:51

WH01-N@4'
2303422-02 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **03/15/23 10:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
Benzene	ND	0.0020		mg/kg	1	BGC0571	03/18/23	03/22/23	EPA 8260B	
Toluene	ND	0.0050		"	"	"	"	"	"	
Ethylbenzene	ND	0.0050		"	"	"	"	"	"	
Xylenes (total)	ND	0.010		"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.0050		"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.0050		"	"	"	"	"	"	
Naphthalene	ND	0.0038		"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50		"	"	"	"	"	"	

Date Sampled: **03/15/23 10:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
Surrogate: 1,2-Dichloroethane-d4		146 %		50-150		"	"	"	"	
Surrogate: Toluene-d8		93.8 %		50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		109 %		50-150		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **03/15/23 10:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
C10-C28 (DRO)	ND	50		mg/kg	1	BGC0574	03/18/23	03/20/23	EPA 8015M	
C28-C36 (ORO)	ND	50		"	"	"	"	"	"	

Date Sampled: **03/15/23 10:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
Surrogate: o-Terphenyl		79.2 %		30-150		"	"	"	"	

PAH by EPA Method 8270D SIM

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/03/23 10:51

WH01-N@4'
2303422-02 (Soil)

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **03/15/23 10:40**

Analyte	Result	Reporting Limit	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500		mg/kg	1	BGC0771	03/23/23	03/24/23	EPA 8270D SIM	
Anthracene	ND	0.00500		"	"	"	"	"	"	"
Benzo (a) anthracene	ND	0.00500		"	"	"	"	"	"	"
Benzo (a) pyrene	ND	0.00500		"	"	"	"	"	"	"
Benzo (b) fluoranthene	ND	0.00500		"	"	"	"	"	"	"
Benzo (k) fluoranthene	ND	0.00500		"	"	"	"	"	"	"
Chrysene	ND	0.00500		"	"	"	"	"	"	"
Dibenz (a,h) anthracene	ND	0.00500		"	"	"	"	"	"	"
Fluoranthene	ND	0.00500		"	"	"	"	"	"	"
Fluorene	ND	0.00500		"	"	"	"	"	"	"
Indeno (1,2,3-cd) pyrene	ND	0.00500		"	"	"	"	"	"	"
Pyrene	ND	0.00500		"	"	"	"	"	"	"
1-Methylnaphthalene	ND	0.00500		"	"	"	"	"	"	"
2-Methylnaphthalene	ND	0.00500		"	"	"	"	"	"	"

Date Sampled: **03/15/23 10:40**

Analyte	Result	Reporting Limit	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10		74.3 %		40-150		"	"	"	"	"
Surrogate: Fluoranthene-d10		71.0 %		40-150		"	"	"	"	"

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **03/15/23 10:40**

Analyte	Result	Reporting Limit	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	0.126	0.0100		mg/L	1	BGC0653	03/20/23	03/22/23	EPA 6020B	

Total Metals by EPA 6020B

Date Sampled: **03/15/23 10:40**

Analyte	Result	Reporting Limit	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----------------	-----	-------	----------	-------	----------	----------	--------	-------

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/03/23 10:51

WH01-N@4'
2303422-02 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Analyte	Result	Limit	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	2.64	0.211	0.178	mg/kg dry	1	BGC0678	03/21/23	03/22/23	EPA 6020B	
Barium	57.3	0.422	0.334	"	"	"	"	"	"	
Cadmium	0.297	0.211	0.00760	"	"	"	"	"	"	
Copper	7.16	0.422	0.0221	"	"	"	"	"	"	
Lead	10.9	0.211	0.0580	"	"	"	"	"	"	
Nickel	3.61	0.422	0.0644	"	"	"	"	"	"	
Selenium	ND	0.260	0.175	"	"	"	"	"	"	
Silver	0.0874	0.0211	0.00282	"	"	"	"	"	"	
Zinc	23.4	0.422	0.281	"	"	"	"	"	"	

Hexavalent Chromium by EPA Method 7196

Date Sampled: 03/15/23 10:40

Analyte	Result	Reporting Limit	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	0.30		mg/kg dry	1	BGC0719	03/21/23	03/21/23	EPA 7196A	

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Date Sampled: 03/15/23 10:40

Analyte	Result	Reporting Limit	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	32.3	0.0528		mg/L dry	1	BGC0629	03/20/23	03/21/23	EPA 6020B	
Magnesium	13.2	0.0528		"	"	"	"	"	"	
Sodium	30.0	0.0528		"	"	"	"	"	"	

Calculated Analysis

Date Sampled: 03/15/23 10:40

Analyte	Result	Reporting Limit	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	1.12	0.00100		units	1	BGC0817	03/24/23	03/24/23	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy 1775 Sherman St. STE. 3000 Denver CO, 80203	Project: Howard 14-18 Wellhead Project Number: [none] Project Manager: Mark Longhurst	Reported: 04/03/23 10:51
--	---	------------------------------------

WH01-N@4'
2303422-02 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **03/15/23 10:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
% Solids	94.7			%	1	BGC0714	03/21/23	03/23/23	Calculation	

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **03/15/23 10:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
Specific Conductance (EC)	0.482	0.0100		mmhos/cm	1	BGC0661	03/21/23	03/21/23	EPA 120.1	

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction

Date Sampled: **03/15/23 10:40**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
pH	7.71			pH Units	1	BGC0662	03/21/23	03/21/23	EPA 9045D	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.





PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Howard 14-18 Wellhead

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 04/03/23 10:51

WH01-S@4'
2303422-04 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **03/15/23 10:44**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
Arsenic	2.26	0.200		mg/kg dry	1	BGC0985	03/29/23	03/31/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **03/15/23 10:44**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
% Solids	87.5			%	1	BGC1012	03/30/23	03/30/23	Calculation	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.





PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/03/23 10:51

WH01-N@2.5'
2303422-06 (Soil)

Summit Scientific

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **03/15/23 10:52**

Analyte	Result	Reporting Limit	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	0.0206	0.0100		mg/L	1	BGC0653	03/20/23	03/22/23	EPA 6020B	

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction

Date Sampled: **03/15/23 10:52**

Analyte	Result	Reporting Limit	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	23.0	0.0507		mg/L dry	1	BGC0629	03/20/23	03/21/23	EPA 6020B	
Magnesium	6.49	0.0507		"	"	"	"	"	"	
Sodium	7.64	0.0507		"	"	"	"	"	"	

Calculated Analysis

Date Sampled: **03/15/23 10:52**

Analyte	Result	Reporting Limit	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.362	0.00100		units	1	BGC0817	03/24/23	03/24/23	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **03/15/23 10:52**

Analyte	Result	Reporting Limit	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	98.6			%	1	BGC0714	03/21/23	03/23/23	Calculation	

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **03/15/23 10:52**

Analyte	Result	Reporting Limit	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.0797	0.0100		mmhos/cm	1	BGC0661	03/21/23	03/21/23	EPA 120.1	

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Howard 14-18 Wellhead

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 04/03/23 10:51

WH01-N@2.5'
2303422-06 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction

Date Sampled: **03/15/23 10:52**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
pH	7.71			pH Units	1	BGC0662	03/21/23	03/21/23	EPA 9045D	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.





PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/03/23 10:51

BKG01@2.5'
2303422-07 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **03/15/23 12:00**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
Arsenic	0.600	0.203	0.171	mg/kg dry	1	BGC0678	03/21/23	03/22/23	EPA 6020B	
Barium	45.4	0.407	0.322	"	"	"	"	"	"	"
Cadmium	0.114	0.203	0.00733	"	"	"	"	"	"	"
Copper	1.97	0.407	0.0213	"	"	"	"	"	"	"
Lead	1.75	0.203	0.0559	"	"	"	"	"	"	"
Nickel	2.53	0.407	0.0621	"	"	"	"	"	"	"
Selenium	ND	0.260	0.175	"	"	"	"	"	"	"
Silver	0.0191	0.0203	0.00272	"	"	"	"	"	"	"
Zinc	6.39	0.407	0.271	"	"	"	"	"	"	"

Hexavalent Chromium by EPA Method 7196

Date Sampled: **03/15/23 12:00**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
Chromium, Hexavalent	ND	0.30		mg/kg dry	1	BGC0719	03/21/23	03/21/23	EPA 7196A	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **03/15/23 12:00**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
% Solids	98.3			%	1	BGC0714	03/21/23	03/23/23	Calculation	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/03/23 10:51

BKG01@4'
2303422-08 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **03/15/23 12:05**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
Arsenic	0.976	0.203	0.171	mg/kg dry	1	BGC0678	03/21/23	03/22/23	EPA 6020B	
Barium	44.2	0.407	0.321	"	"	"	"	"	"	
Cadmium	0.0817	0.203	0.00732	"	"	"	"	"	"	
Copper	1.48	0.407	0.0212	"	"	"	"	"	"	
Lead	1.76	0.203	0.0559	"	"	"	"	"	"	
Nickel	1.46	0.407	0.0620	"	"	"	"	"	"	
Selenium	ND	0.260	0.175	"	"	"	"	"	"	
Silver	0.00691	0.0203	0.00271	"	"	"	"	"	"	
Zinc	5.59	0.407	0.270	"	"	"	"	"	"	

Hexavalent Chromium by EPA Method 7196

Date Sampled: **03/15/23 12:05**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
Chromium, Hexavalent	ND	0.30		mg/kg dry	1	BGC0719	03/21/23	03/21/23	EPA 7196A	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **03/15/23 12:05**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
% Solids	98.4			%	1	BGC0714	03/21/23	03/23/23	Calculation	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/03/23 10:51

BKG01@8'
2303422-09 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **03/15/23 12:10**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
Arsenic	0.709	0.204	0.172	mg/kg dry	1	BGC0678	03/21/23	03/22/23	EPA 6020B	
Barium	37.9	0.408	0.323	"	"	"	"	"	"	
Cadmium	0.0682	0.204	0.00735	"	"	"	"	"	"	
Copper	1.48	0.408	0.0213	"	"	"	"	"	"	
Lead	1.47	0.204	0.0561	"	"	"	"	"	"	
Nickel	1.26	0.408	0.0623	"	"	"	"	"	"	
Selenium	ND	0.260	0.175	"	"	"	"	"	"	
Silver	0.00694	0.0204	0.00273	"	"	"	"	"	"	
Zinc	4.81	0.408	0.272	"	"	"	"	"	"	

Hexavalent Chromium by EPA Method 7196

Date Sampled: **03/15/23 12:10**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
Chromium, Hexavalent	ND	0.30		mg/kg dry	1	BGC0719	03/21/23	03/21/23	EPA 7196A	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **03/15/23 12:10**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	MDL							
% Solids	97.9			%	1	BGC0714	03/21/23	03/23/23	Calculation	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/03/23 10:51

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

Analyte	Result	Reporting		Spike Level	Source		%REC		RPD		Notes
		Limit	Units		Result	%REC	Limits	RPD	Limit		

Batch BGC0571 - EPA 5030 Soil MS

Blank (BGC0571-BLK1)

Prepared: 03/18/23 Analyzed: 03/21/23

Benzene	ND	0.0020	mg/kg								
Toluene	ND	0.0050	"								
Ethylbenzene	ND	0.0050	"								
Xylenes (total)	ND	0.010	"								
1,2,4-Trimethylbenzene	ND	0.0050	"								
1,3,5-Trimethylbenzene	ND	0.0050	"								
Naphthalene	ND	0.0038	"								
Gasoline Range Hydrocarbons	ND	0.50	"								
<i>Surrogate: 1,2-Dichloroethane-d4</i>	0.0492		"	0.0400		123	50-150				
<i>Surrogate: Toluene-d8</i>	0.0385		"	0.0400		96.2	50-150				
<i>Surrogate: 4-Bromofluorobenzene</i>	0.0400		"	0.0400		100	50-150				

LCS (BGC0571-BS1)

Prepared: 03/18/23 Analyzed: 03/21/23

Benzene	0.0838	0.0020	mg/kg	0.100		83.8	70-130				
Toluene	0.0724	0.0050	"	0.100		72.4	70-130				
Ethylbenzene	0.0908	0.0050	"	0.100		90.8	70-130				
m,p-Xylene	0.186	0.010	"	0.200		92.8	70-130				
o-Xylene	0.0883	0.0050	"	0.100		88.3	70-130				
1,2,4-Trimethylbenzene	0.0841	0.0050	"	0.100		84.1	70-130				
1,3,5-Trimethylbenzene	0.0876	0.0050	"	0.100		87.6	70-130				
Naphthalene	0.0771	0.0038	"	0.100		77.1	70-130				
<i>Surrogate: 1,2-Dichloroethane-d4</i>	0.0433		"	0.0400		108	50-150				
<i>Surrogate: Toluene-d8</i>	0.0365		"	0.0400		91.2	50-150				
<i>Surrogate: 4-Bromofluorobenzene</i>	0.0416		"	0.0400		104	50-150				

Matrix Spike (BGC0571-MS1)

Source: 2303418-01

Prepared: 03/18/23 Analyzed: 03/21/23

Benzene	0.0798	0.0020	mg/kg	0.100	ND	79.8	70-130				
Toluene	0.0710	0.0050	"	0.100	ND	71.0	70-130				
Ethylbenzene	0.0861	0.0050	"	0.100	ND	86.1	70-130				
m,p-Xylene	0.178	0.010	"	0.200	ND	89.1	70-130				
o-Xylene	0.0884	0.0050	"	0.100	ND	88.4	70-130				
1,2,4-Trimethylbenzene	0.0850	0.0050	"	0.100	ND	85.0	70-130				
1,3,5-Trimethylbenzene	0.0874	0.0050	"	0.100	ND	87.4	70-130				
Naphthalene	0.0805	0.0038	"	0.100	ND	80.5	70-130				
<i>Surrogate: 1,2-Dichloroethane-d4</i>	0.0434		"	0.0400		109	50-150				
<i>Surrogate: Toluene-d8</i>	0.0386		"	0.0400		96.4	50-150				
<i>Surrogate: 4-Bromofluorobenzene</i>	0.0425		"	0.0400		106	50-150				

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Howard 14-18 Wellhead

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 04/03/23 10:51

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

Analyte	Result	Reporting		Spike Level	Source Result	%REC		RPD		Notes
		Limit	Units			%REC	Limits	RPD	Limit	

Batch BGC0571 - EPA 5030 Soil MS

Matrix Spike Dup (BGC0571-MSD1)	Source: 2303418-01			Prepared: 03/18/23 Analyzed: 03/21/23					
Benzene	0.0849	0.0020	mg/kg	0.100	ND	84.9	70-130	6.27	30
Toluene	0.0770	0.0050	"	0.100	ND	77.0	70-130	8.19	30
Ethylbenzene	0.0904	0.0050	"	0.100	ND	90.4	70-130	4.86	30
m,p-Xylene	0.182	0.010	"	0.200	ND	91.1	70-130	2.28	30
o-Xylene	0.0867	0.0050	"	0.100	ND	86.7	70-130	1.95	30
1,2,4-Trimethylbenzene	0.0806	0.0050	"	0.100	ND	80.6	70-130	5.43	30
1,3,5-Trimethylbenzene	0.0865	0.0050	"	0.100	ND	86.5	70-130	1.14	30
Naphthalene	0.0793	0.0038	"	0.100	ND	79.3	70-130	1.58	30
Surrogate: 1,2-Dichloroethane-d4	0.0412		"	0.0400		103	50-150		
Surrogate: Toluene-d8	0.0386		"	0.0400		96.6	50-150		
Surrogate: 4-Bromofluorobenzene	0.0403		"	0.0400		101	50-150		

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/03/23 10:51

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

Analyte	Result	Reporting		Spike Level	Source		%REC		RPD		Notes
		Limit	Units		Result	%REC	Limits	RPD	Limit		

Batch BGC0574 - EPA 3550A

Blank (BGC0574-BLK1)

Prepared: 03/18/23 Analyzed: 03/20/23

C10-C28 (DRO)	ND	50	mg/kg								
C28-C36 (ORO)	ND	50	"								
Surrogate: <i>o</i> -Terphenyl	13.6		"	12.5	109	30-150					

LCS (BGC0574-BS1)

Prepared: 03/18/23 Analyzed: 03/20/23

C10-C28 (DRO)	356	50	mg/kg	500	71.1	70-130					
Surrogate: <i>o</i> -Terphenyl	13.4		"	12.5	107	30-150					

Matrix Spike (BGC0574-MS1)

Source: 2303418-01

Prepared: 03/18/23 Analyzed: 03/20/23

C10-C28 (DRO)	375	50	mg/kg	500	9.70	73.0	70-130				
Surrogate: <i>o</i> -Terphenyl	11.1		"	12.5	88.8	30-150					

Matrix Spike Dup (BGC0574-MSD1)

Source: 2303418-01

Prepared: 03/18/23 Analyzed: 03/20/23

C10-C28 (DRO)	386	50	mg/kg	500	9.70	75.3	70-130	3.03	20		
Surrogate: <i>o</i> -Terphenyl	10.6		"	12.5	85.1	30-150					

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/03/23 10:51

PAH by EPA Method 8270D SIM - Quality Control

Summit Scientific

Analyte	Result	Reporting		Spike Level	Source		%REC		RPD		Notes
		Limit	Units		Result	%REC	Limits	RPD	Limit		

Batch BGC0771 - EPA 5030 Soil MS

Blank (BGC0771-BLK1)

Prepared & Analyzed: 03/23/23

Acenaphthene	ND	0.00500	mg/kg								
Anthracene	ND	0.00500	"								
Benzo (a) anthracene	ND	0.00500	"								
Benzo (a) pyrene	ND	0.00500	"								
Benzo (b) fluoranthene	ND	0.00500	"								
Benzo (k) fluoranthene	ND	0.00500	"								
Chrysene	ND	0.00500	"								
Dibenz (a,h) anthracene	ND	0.00500	"								
Fluoranthene	ND	0.00500	"								
Fluorene	ND	0.00500	"								
Indeno (1,2,3-cd) pyrene	ND	0.00500	"								
Pyrene	ND	0.00500	"								
1-Methylnaphthalene	ND	0.00500	"								
2-Methylnaphthalene	ND	0.00500	"								
Surrogate: 2-Methylnaphthalene-d10	0.0280		"	0.0333	84.0	40-150					
Surrogate: Fluoranthene-d10	0.0285		"	0.0333	85.5	40-150					

LCS (BGC0771-BS1)

Prepared & Analyzed: 03/23/23

Acenaphthene	0.0311	0.00500	mg/kg	0.0333	93.2	31-137					
Anthracene	0.0293	0.00500	"	0.0333	87.8	30-120					
Benzo (a) anthracene	0.0247	0.00500	"	0.0333	74.0	30-120					
Benzo (a) pyrene	0.0317	0.00500	"	0.0333	95.2	30-120					
Benzo (b) fluoranthene	0.0301	0.00500	"	0.0333	90.4	30-120					
Benzo (k) fluoranthene	0.0362	0.00500	"	0.0333	109	30-120					
Chrysene	0.0273	0.00500	"	0.0333	81.9	30-120					
Dibenz (a,h) anthracene	0.0249	0.00500	"	0.0333	74.6	30-120					
Fluoranthene	0.0293	0.00500	"	0.0333	87.9	30-120					
Fluorene	0.0318	0.00500	"	0.0333	95.5	30-120					
Indeno (1,2,3-cd) pyrene	0.0275	0.00500	"	0.0333	82.4	30-120					
Pyrene	0.0327	0.00500	"	0.0333	98.1	35-142					
1-Methylnaphthalene	0.0334	0.00500	"	0.0333	100	35-142					
2-Methylnaphthalene	0.0206	0.00500	"	0.0333	61.7	35-142					
Surrogate: 2-Methylnaphthalene-d10	0.0399		"	0.0333	120	40-150					
Surrogate: Fluoranthene-d10	0.0308		"	0.0333	92.3	40-150					

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/03/23 10:51

PAH by EPA Method 8270D SIM - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source	%REC			RPD	Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

Batch BGC0771 - EPA 5030 Soil MS

Matrix Spike (BGC0771-MS1)	Source: 2303414-01			Prepared & Analyzed: 03/23/23							
Acenaphthene	0.0844	0.00500	mg/kg	0.0333	0.0190	196	31-137				QM-02
Anthracene	0.140	0.00500	"	0.0333	0.0284	335	30-120				QM-02
Benzo (a) anthracene	0.164	0.00500	"	0.0333	0.0331	394	30-120				QM-02
Benzo (a) pyrene	0.0862	0.00500	"	0.0333	0.0154	213	30-120				QM-02
Benzo (b) fluoranthene	0.135	0.00500	"	0.0333	0.0276	322	30-120				QM-02
Benzo (k) fluoranthene	0.0617	0.00500	"	0.0333	0.0106	153	30-120				QM-02
Chrysene	0.133	0.00500	"	0.0333	0.0280	315	30-120				QM-02
Dibenz (a,h) anthracene	0.0419	0.00500	"	0.0333	ND	126	30-120				QM-02
Fluoranthene	0.358	0.00500	"	0.0333	0.0860	816	30-120				QM-02
Fluorene	0.103	0.00500	"	0.0333	0.0213	246	30-120				QM-02
Indeno (1,2,3-cd) pyrene	0.0682	0.00500	"	0.0333	0.0108	172	30-120				QM-02
Pyrene	0.251	0.00500	"	0.0333	0.0621	568	35-142				QM-02
1-Methylnaphthalene	0.0302	0.00500	"	0.0333	ND	90.7	15-130				
2-Methylnaphthalene	0.0230	0.00500	"	0.0333	ND	69.0	15-130				
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0299</i>		<i>"</i>	<i>0.0333</i>		<i>89.7</i>	<i>40-150</i>				
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0253</i>		<i>"</i>	<i>0.0333</i>		<i>75.9</i>	<i>40-150</i>				

Matrix Spike Dup (BGC0771-MSD1)	Source: 2303414-01			Prepared & Analyzed: 03/23/23							
Acenaphthene	0.0544	0.00500	mg/kg	0.0333	0.0190	106	31-137	43.2	30		QM-02
Anthracene	0.0751	0.00500	"	0.0333	0.0284	140	30-120	60.4	30		QM-02
Benzo (a) anthracene	0.0942	0.00500	"	0.0333	0.0331	183	30-120	54.3	30		QM-02
Benzo (a) pyrene	0.0534	0.00500	"	0.0333	0.0154	114	30-120	47.0	30		QM-02
Benzo (b) fluoranthene	0.0831	0.00500	"	0.0333	0.0276	167	30-120	47.6	30		QM-02
Benzo (k) fluoranthene	0.0452	0.00500	"	0.0333	0.0106	104	30-120	30.9	30		QM-02
Chrysene	0.0718	0.00500	"	0.0333	0.0280	131	30-120	59.7	30		QM-02
Dibenz (a,h) anthracene	0.0337	0.00500	"	0.0333	ND	101	30-120	21.7	30		
Fluoranthene	0.199	0.00500	"	0.0333	0.0860	339	30-120	57.1	30		QM-02
Fluorene	0.0641	0.00500	"	0.0333	0.0213	128	30-120	46.8	30		QM-02
Indeno (1,2,3-cd) pyrene	0.0448	0.00500	"	0.0333	0.0108	102	30-120	41.5	30		QM-02
Pyrene	0.146	0.00500	"	0.0333	0.0621	251	35-142	53.3	30		QM-02
1-Methylnaphthalene	0.0305	0.00500	"	0.0333	ND	91.4	15-130	0.736	50		
2-Methylnaphthalene	0.0207	0.00500	"	0.0333	ND	62.2	15-130	10.4	50		
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0311</i>		<i>"</i>	<i>0.0333</i>		<i>93.2</i>	<i>40-150</i>				
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0265</i>		<i>"</i>	<i>0.0333</i>		<i>79.6</i>	<i>40-150</i>				

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Howard 14-18 Wellhead

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 04/03/23 10:51

Total Metals by EPA 6020B Hot Water Soluble Extraction - Quality Control
Summit Scientific

Analyte	Result	Reporting		Spike Level	Source		%REC		RPD		Notes
		Limit	Units		Result	%REC	Limits	RPD	Limit		

Batch BGC0653 - EPA 3050B

Blank (BGC0653-BLK1)

Prepared: 03/20/23 Analyzed: 03/22/23

Boron ND 0.0100 mg/L

LCS (BGC0653-BS1)

Prepared: 03/20/23 Analyzed: 03/22/23

Boron 4.94 0.0100 mg/L 5.00 98.7 80-120

Duplicate (BGC0653-DUP1)

Source: 2303414-01

Prepared: 03/20/23 Analyzed: 03/22/23

Boron 0.162 0.0100 mg/L 0.165 1.71 20

Matrix Spike (BGC0653-MS1)

Source: 2303414-01

Prepared: 03/20/23 Analyzed: 03/22/23

Boron 5.29 0.0100 mg/L 5.00 0.165 102 75-125

Matrix Spike Dup (BGC0653-MSD1)

Source: 2303414-01

Prepared: 03/20/23 Analyzed: 03/22/23

Boron 5.17 0.0100 mg/L 5.00 0.165 100 75-125 2.30 25

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/03/23 10:51

Total Metals by EPA 6020B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source	%REC		RPD		Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

Batch BGC0678 - EPA 3050B

Blank (BGC0678-BLK1)

Prepared: 03/21/23 Analyzed: 03/22/23

Arsenic	ND	0.200	mg/kg wet							
Barium	ND	0.400	"							
Cadmium	ND	0.200	"							
Copper	ND	0.400	"							
Lead	ND	0.200	"							
Nickel	ND	0.400	"							
Selenium	ND	0.260	"							
Silver	ND	0.0200	"							
Zinc	ND	0.400	"							

LCS (BGC0678-BS1)

Prepared: 03/21/23 Analyzed: 03/22/23

Arsenic	40.2	0.200	mg/kg wet	40.0		101	80-120			
Barium	40.8	0.400	"	40.0		102	80-120			
Cadmium	2.03	0.200	"	2.00		101	80-120			
Copper	39.0	0.400	"	40.0		97.4	80-120			
Lead	20.1	0.200	"	20.0		101	80-120			
Nickel	38.7	0.400	"	40.0		96.7	80-120			
Selenium	4.11	0.260	"	4.00		103	80-120			
Silver	2.38	0.0200	"	2.00		119	80-120			
Zinc	38.5	0.400	"	40.0		96.3	80-120			

Duplicate (BGC0678-DUP1)

Source: 2303422-01

Prepared: 03/21/23 Analyzed: 03/22/23

Arsenic	1.04	0.207	mg/kg dry		0.987			4.79	20	
Barium	25.3	0.414	"		22.0			14.0	20	
Cadmium	0.105	0.207	"		0.0903			14.9	20	
Copper	3.16	0.414	"		2.76			13.6	20	
Lead	4.59	0.207	"		3.30			32.6	20	RPD-1
Nickel	1.92	0.414	"		1.84			4.25	20	
Selenium	ND	0.260	"		ND				20	
Silver	0.0269	0.0207	"		0.0253			6.35	20	
Zinc	11.0	0.414	"		9.06			18.8	20	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
1775 Sherman St. STE. 3000
Denver CO, 80203

Project: Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
04/03/23 10:51

Total Metals by EPA 6020B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD		Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit		

Batch BGC0678 - EPA 3050B

Matrix Spike (BGC0678-MS1)		Source: 2303422-01			Prepared: 03/21/23		Analyzed: 03/22/23	
Arsenic	44.4	0.207	mg/kg dry	41.4	0.987	105	75-125	
Barium	67.2	0.414	"	41.4	22.0	109	75-125	
Cadmium	2.26	0.207	"	2.07	0.0903	105	75-125	
Copper	37.5	0.414	"	41.4	2.76	83.8	75-125	
Lead	25.1	0.207	"	20.7	3.30	105	75-125	
Nickel	36.8	0.414	"	41.4	1.84	84.4	75-125	
Selenium	4.16	0.260	"	4.14	ND	100	75-125	
Silver	2.68	0.0207	"	2.07	0.0253	128	75-125	QM-05
Zinc	45.6	0.414	"	41.4	9.06	88.3	75-125	

Matrix Spike Dup (BGC0678-MSD1)		Source: 2303422-01			Prepared: 03/21/23		Analyzed: 03/22/23	
Arsenic	45.2	0.207	mg/kg dry	41.4	0.987	107	75-125	1.89 25
Barium	67.8	0.414	"	41.4	22.0	110	75-125	0.925 25
Cadmium	2.29	0.207	"	2.07	0.0903	106	75-125	0.947 25
Copper	38.1	0.414	"	41.4	2.76	85.3	75-125	1.59 25
Lead	25.4	0.207	"	20.7	3.30	107	75-125	1.42 25
Nickel	37.4	0.414	"	41.4	1.84	85.9	75-125	1.69 25
Selenium	4.25	0.260	"	4.14	ND	103	75-125	2.14 25
Silver	2.70	0.0207	"	2.07	0.0253	129	75-125	0.770 25
Zinc	46.1	0.414	"	41.4	9.06	89.5	75-125	1.08 25

Batch BGC0985 - EPA 3050B

Blank (BGC0985-BLK1)					Prepared: 03/29/23		Analyzed: 03/31/23	
Arsenic	ND	0.200	mg/kg wet					

LCS (BGC0985-BS1)					Prepared: 03/29/23		Analyzed: 03/31/23	
Arsenic	36.5	0.200	mg/kg wet	40.0		91.2	80-120	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Howard 14-18 Wellhead

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 04/03/23 10:51

Total Metals by EPA 6020B - Quality Control
Summit Scientific

Analyte	Result	Reporting		Spike Level	Source		%REC		RPD		Notes
		Limit	Units		Result	%REC	Limits	RPD	Limit		

Batch BGC0985 - EPA 3050B

Duplicate (BGC0985-DUP1)		Source: 2303414-03			Prepared: 03/29/23 Analyzed: 03/31/23	
Arsenic	1.27	0.200	mg/kg dry	1.23		2.89 20
Matrix Spike (BGC0985-MS1)		Source: 2303414-03			Prepared: 03/29/23 Analyzed: 03/31/23	
Arsenic	39.5	0.200	mg/kg dry	43.1	1.23	88.8 75-125
Matrix Spike Dup (BGC0985-MSD1)		Source: 2303414-03			Prepared: 03/29/23 Analyzed: 03/31/23	
Arsenic	40.0	0.200	mg/kg dry	43.1	1.23	89.9 75-125 1.23 25

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Howard 14-18 Wellhead

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 04/03/23 10:51

Hexavalent Chromium by EPA Method 7196 - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD		Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit		

Batch BGC0719 - 3060A Mod

Blank (BGC0719-BLK1)

Prepared & Analyzed: 03/21/23

Chromium, Hexavalent ND 0.30 mg/kg wet

LCS (BGC0719-BS1)

Prepared & Analyzed: 03/21/23

Chromium, Hexavalent 24.6 0.30 mg/kg wet 25.0 98.2 80-120

Duplicate (BGC0719-DUP1)

Source: 2303422-01

Prepared & Analyzed: 03/21/23

Chromium, Hexavalent ND 0.30 mg/kg dry ND 20

Matrix Spike (BGC0719-MS1)

Source: 2303422-01

Prepared & Analyzed: 03/21/23

Chromium, Hexavalent 24.6 0.30 mg/kg dry 25.9 ND 95.0 75-125

Matrix Spike Dup (BGC0719-MSD1)

Source: 2303422-01

Prepared & Analyzed: 03/21/23

Chromium, Hexavalent 24.8 0.30 mg/kg dry 25.9 ND 95.6 75-125 0.630 20

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy 1775 Sherman St. STE. 3000 Denver CO, 80203	Project: Howard 14-18 Wellhead Project Number: [none] Project Manager: Mark Longhurst	Reported: 04/03/23 10:51
--	---	------------------------------------

Soluble Nutrients by EPA 6020/USDA60 6(2) - Saturated Paste Extraction - Quality Control
Summit Scientific

Analyte	Result	Reporting		Spike Level	Source Result	%REC		RPD		Notes
		Limit	Units			%REC	Limits	RPD	Limit	

Batch BGC0629 - General Preparation

Blank (BGC0629-BLK1)

Prepared: 03/20/23 Analyzed: 03/21/23

Calcium	ND	0.0500	mg/L wet							
Magnesium	ND	0.0500	"							
Sodium	ND	0.0500	"							

LCS (BGC0629-BS1)

Prepared: 03/20/23 Analyzed: 03/21/23

Calcium	5.31	0.0500	mg/L wet	5.00	106	70-130				
Magnesium	5.02	0.0500	"	5.00	100	70-130				
Sodium	5.04	0.0500	"	5.00	101	70-130				

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.





PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Howard 14-18 Wellhead

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 04/03/23 10:51

Physical Parameters by APHA/ASTM/EPA Methods - Quality Control

Summit Scientific

Analyte	Result	Reporting		Spike Level	Source Result	%REC		RPD		Notes
		Limit	Units			%REC	Limits	RPD	Limit	

Batch BGC0714 - General Preparation

Duplicate (BGC0714-DUP1)		Source: 2303420-01		Prepared: 03/21/23 Analyzed: 03/23/23		
% Solids	97.4		%		96.9	0.513 20

Batch BGC1012 - General Preparation

Duplicate (BGC1012-DUP1)		Source: 2303422-04		Prepared & Analyzed: 03/30/23		
% Solids	87.2		%		87.5	0.321 20

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy
 1775 Sherman St. STE. 3000
 Denver CO, 80203

Project: Howard 14-18 Wellhead

Project Number: [none]
 Project Manager: Mark Longhurst

Reported:
 04/03/23 10:51

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction - Quality Control

Summit Scientific

Analyte	Result	Reporting		Spike Level	Source Result	%REC		RPD		Notes
		Limit	Units			Limits	RPD	Limit		

Batch BGC0661 - General Preparation

Blank (BGC0661-BLK1)

Prepared & Analyzed: 03/21/23

Specific Conductance (EC) ND 0.0100 mmhos/cm

LCS (BGC0661-BS1)

Prepared & Analyzed: 03/21/23

Specific Conductance (EC) 0.153 0.0100 mmhos/cm 0.150 102 95-105

Duplicate (BGC0661-DUP1)

Source: 2303372-01

Prepared & Analyzed: 03/21/23

Specific Conductance (EC) 5.15 0.0100 mmhos/cm 5.16 0.213 20

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



PDC Energy 1775 Sherman St. STE. 3000 Denver CO, 80203	Project: Howard 14-18 Wellhead Project Number: [none] Project Manager: Mark Longhurst	Reported: 04/03/23 10:51
--	---	------------------------------------

Physical Parameters by APHA/ASTM/EPA Methods, Saturated Paste Extraction - Quality Control
Summit Scientific

Analyte	Result	Reporting		Spike	Source	%REC		RPD		Notes
		Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

Batch BGC0662 - General Preparation

LCS (BGC0662-BS1)			Prepared & Analyzed: 03/21/23							
pH	9.16		pH Units	9.18		99.8	95-105			
Duplicate (BGC0662-DUP1)			Source: 2303372-01		Prepared & Analyzed: 03/21/23					
pH	7.76		pH Units	7.75				0.129	20	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.





PDC Energy

1775 Sherman St. STE. 3000

Denver CO, 80203

Project: Howard 14-18 Wellhead

Project Number: [none]

Project Manager: Mark Longhurst

Reported:

04/03/23 10:51

Notes and Definitions

- RPD-1 The RPD failure for the sample duplicate analysis is most likely due to a non-homogeneous sample matrix.
- QM-05 The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The associated LCS and/or LCSD were within acceptance limits, therefore the data are considered valid.
- QM-02 The RPD and/or percent recovery for this QC sample cannot be accurately calculated due to the high concentration of analyte inherent in the sample.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

December 05, 2023

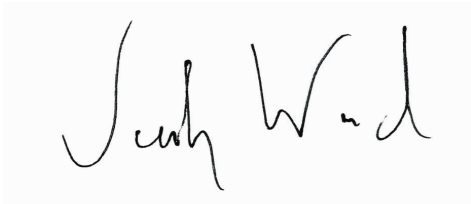
Mark Longhurst
Tasman Geosciences
6855 W. 119th Ave.
Broomfield, CO 80020

RE: PDC - Howard 14-18 Wellhead

Work Order #2310194

Enclosed are the results of analyses for samples received by Summit Scientific on 10/10/23 17:40. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Jacob Wood". The signature is written in a cursive style with a large initial "J" and "W".

Jacob Wood For Paul Shrewsbury
President



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SB01@8.5'	2310194-01	Soil	10/10/23 10:00	10/10/23 17:40
SB02@5'	2310194-05	Soil	10/10/23 13:54	10/10/23 17:40
SB02@6'	2310194-06	Soil	10/10/23 13:56	10/10/23 17:40
SB02@7'	2310194-07	Soil	10/10/23 13:58	10/10/23 17:40
SB03@5'	2310194-09	Soil	10/10/23 12:02	10/10/23 17:40
SB03@6'	2310194-10	Soil	10/10/23 12:04	10/10/23 17:40
SB03@7'	2310194-11	Soil	10/10/23 12:06	10/10/23 17:40
SB04@5'	2310194-13	Soil	10/10/23 11:02	10/10/23 17:40
SB04@6'	2310194-14	Soil	10/10/23 11:05	10/10/23 17:40
SB04@8'	2310194-15	Soil	10/10/23 11:10	10/10/23 17:40
SB04@9'	2310194-16	Soil	10/10/23 11:12	10/10/23 17:40
SB05@5'	2310194-19	Soil	10/10/23 10:32	10/10/23 17:40
BKG02@2.5'	2310194-20	Soil	10/10/23 11:15	10/10/23 17:40
BKG02@5'	2310194-21	Soil	10/10/23 11:17	10/10/23 17:40
BKG02@6'	2310194-22	Soil	10/10/23 11:19	10/10/23 17:40
BKG02@8'	2310194-23	Soil	10/10/23 11:21	10/10/23 17:40
BKG02@9'	2310194-24	Soil	10/10/23 11:23	10/10/23 17:40
BKG02@10'	2310194-25	Soil	10/10/23 11:25	10/10/23 17:40
BKG03@2.5'	2310194-26	Soil	10/10/23 10:41	10/10/23 17:40
BKG03@5'	2310194-27	Soil	10/10/23 10:42	10/10/23 17:40
BKG03@6'	2310194-28	Soil	10/10/23 10:43	10/10/23 17:40
BKG03@8'	2310194-29	Soil	10/10/23 10:44	10/10/23 17:40
BKG03@9'	2310194-30	Soil	10/10/23 10:45	10/10/23 17:40
BKG03@10'	2310194-31	Soil	10/10/23 10:46	10/10/23 17:40
BKG04@2.5'	2310194-32	Soil	10/10/23 13:00	10/10/23 17:40
BKG04@5'	2310194-33	Soil	10/10/23 13:02	10/10/23 17:40
BKG04@6'	2310194-34	Soil	10/10/23 13:04	10/10/23 17:40

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BKG04@8'	2310194-35	Soil	10/10/23 13:06	10/10/23 17:40
BKG04@9'	2310194-36	Soil	10/10/23 13:09	10/10/23 17:40
BKG04@10'	2310194-37	Soil	10/10/23 13:10	10/10/23 17:40
BKG05@2.5'	2310194-38	Soil	10/10/23 14:11	10/10/23 17:40
BKG05@5'	2310194-39	Soil	10/10/23 14:13	10/10/23 17:40
BKG05@6'	2310194-40	Soil	10/10/23 14:15	10/10/23 17:40
BKG05@8'	2310194-41	Soil	10/10/23 14:17	10/10/23 17:40
BKG05@9'	2310194-42	Soil	10/10/23 14:19	10/10/23 17:40
BKG05@10'	2310194-43	Soil	10/10/23 14:21	10/10/23 17:40

Case Narrative


Bryce Goldade requested Arsenic be added to SB01@8.5', SB02@5', SB03@5', SB04@5' & SB05@5' on 10/25/2023.

Bryce Goldade requested Arsenic be added to SB02@6', SB03@6', & SB04@6' on 11/8/2023.

Bryce Goldade requested Arsenic be added to SB02@7', SB03@7', SB04@8', & SB04@9' on 11/21/2023.

This report includes those results.

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

SUMMIT SCIENTIFIC

4653 Table Mountain Drive
Golden, CO 80403
303-277-9310

Lab ID 2310194.1 Page 1 of 3

Client: PDC / Tasman		Send Data To: Project Manager: Mark Longhurst		Send Invoice To: Company: PDC Energy	
Address: 6855 W 119th Ave		E-Mail: mark.longhurst@PDCE.com		Project Name/Location:	
City/State/Zip: Broomfield / CO / 80020				AFE#:	
Phone: 303-487-1228		Project Name: <u>Howard 14-18 wellhead</u>		PO/Billing Codes:	
Sampler Name: <u>R. Yavinsky</u>		Project Number:		Contact: Mark Longhurst	

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix		Air-Canister #	Analysis Requested					Special Instructions
					HCl	HNO3	None	Other	Water	Soil		Other	BTEXN - 8260B	TPH - (C6 - C36)	1,2,4 & 1,3,5-TMB	Boron - HWS	
1	SB01 @ 8.5'	10/10/23	1000	1			X			X							X ON HOLD
2	SB01 @ 9'		1002														
3	SB01 @ 10'		1004														
4	SB02 @ 2.5'		1352														
5	SB02 @ 5'		1354														
6	SB02 @ 6'		1356														
7	SB02 @ 7'		1358														
8	SB03 @ 2.5'		1206														
9	SB03 @ 5'		1202														
10	SB03 @ 6'		1204														
11	SB03 @ 7'		1206														
12	SB04 @ 2.5'		1100														
13	SB04 @ 5'		1102														
14	SB04 @ 6'		1105														
15	SB04 @ 8'		1110														

Relinquished by: <u>[Signature]</u> Date/Time: <u>10/10/23 1555</u>	Received by: <u>Tasman codebox</u> Date/Time: <u>10/10/23 1555</u>	TAT Business Days	Field DO	Notes:
		Same Day	Field EC	
Relinquished by: <u>Tasman codebox</u> Date/Time: <u>10/23 1740</u>	Received by: <u>[Signature]</u> Date/Time: <u>10/23 1740</u>	1 Day	Field ORP	
		2 Days	Field pH	
Relinquished by: _____ Date/Time: _____	Received by: _____ Date/Time: _____	3 Days	Field Temp.	
Temperature Upon Receipt: <u>9.4</u>	Corrected Temperature: <u>⊖</u>	Standard	<input checked="" type="checkbox"/> Field Turb.	
	IR gun #: _____		HNO3 lot #: _____	

Client: PDC / Tasman		Send Data To: Project Manager: Mark Longhurst		Send Invoice To: Company: PDC Energy	
Address: 6855 W 119th Ave		E-Mail: mark.longhurst@PDCE.com		Project Name/Location:	
City/State/Zip: Broomfield / CO / 80020				AFE#:	
Phone: 303-487-1228		Project Name: <u>Howard 14-18 wellhead</u>		PO/Billing Codes:	
Sampler Name: <u>R. Tavinsky</u>		Project Number:		Contact: Mark Longhurst	

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix			Analysis Requested						Special Instructions
					HCl	HNO3	None	Other	Water	Soil	Air-Canister #	Other	BTEXN - 8260B	TPH - (C6 - C36)	1,2,4 & 1,3,5-TMB	Boron - HWS	pH, EC, SAR	
1	SB04 @ 9'	10/10/23	1112	1			X			X							X	
2	SB04 @ 10'		1114															
3	SB05 @ 2.5'		1030															
4	SB05 @ 5'		1032															
5	BK602 @ 2.5'		1115															X
6	BK602 @ 5'		1117															
7	BK602 @ 6'		1119															
8	BK602 @ 8'		1121															
9	BK602 @ 9'		1123															
10	BK602 @ 10'		1125															
11	BK603 @ 2.5'		1041															
12	BK603 @ 5'		1042															
13	BK603 @ 6'		1043															
14	BK603 @ 8'		1044															
15	BK603 @ 9'		1045															

Relinquished by: <u>[Signature]</u>	Date/Time: 10/10/23 1555	Received by: <u>Tasman lockbox</u>	Date/Time: 10/10/23 1555	TAT Business Days	Field DO	Notes:
				Same Day	Field EC	
Relinquished by: <u>Tasman lockbox</u>	Date/Time: 10/10/23 1740	Received by: <u>[Signature]</u>	Date/Time: 10/10/23 1740	1 Day	Field ORP	
				2 Days	Field pH	
Relinquished by:	Date/Time:	Received by:	Date/Time:	3 Days	Field Temp.	
				Standard	Field Turb. <input checked="" type="checkbox"/>	
Temperature Upon Receipt: <u>9.4</u>	Corrected Temperature: <u>9</u>	IR gun #: <u>1</u>	HNO3 lot #:			

Client: PDC / Tasman		Send Data To: Project Manager: Mark Longhurst		Send Invoice To: Company: PDC Energy	
Address: 6855 W 119th Ave		E-Mail: mark.longhurst@PDCE.com		Project Name/Location:	
City/State/Zip: Broomfield / CO / 80020				AFE#:	
Phone: 303-487-1228		Project Name: <u>Howard 14-18 Wellhead</u>		PO/Billing Codes:	
Sampler Name: <u>R. Yavinsky</u>		Project Number:		Contact: Mark Longhurst	

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested					Special Instructions	
					HCl	HNO3	None	Other	Water	Soil	Air-Canister #	Other	BTEXN - 8260B	TPH - (C6 - C36)	1,2,4 & 1,3,5-TMB	Boron - HWS	pH, EC, SAR		Arsenic
1	BK603 @ 10'	10/10/23	1046	1			X			X								X	
2	BK604 @ 2.5'		1300																
3	BK604 @ 5'		1302																
4	BK604 @ 6'		1304																
5	BK604 @ 8'		1306																
6	BK604 @ 9'		1308																
7	BK604 @ 10'		1310																
8	BK605 @ 2.5'		1411																
9	BK605 @ 5'		1413																
10	BK605 @ 6'		1415																
11	BK605 @ 8'		1417																
12	BK605 @ 9'		1419																
13	BK605 @ 10'		1421																
14																			
15																			

Relinquished by: <u>[Signature]</u> Date/Time: <u>10/10/23 1555</u>	Received by: <u>Tasman mailbox</u> Date/Time: <u>10/10/23 1555</u>	TAT Business Days	Field DO	Notes:
		Same Day	Field EC	
Relinquished by: <u>Tasmanilackeex</u> Date/Time: <u>10/10/23 1740</u>	Received by: <u>[Signature]</u> Date/Time: <u>10/10/23 1740</u>	1 Day	Field ORP	
		2 Days	Field pH	
Relinquished by: _____ Date/Time: _____	Received by: _____ Date/Time: _____	3 Days	Field Temp.	
Temperature Upon Receipt: <u>94</u>	Corrected Temperature: <u>9</u>	Standard	Field Turb. <input checked="" type="checkbox"/>	
	IR gun #: _____		HNO3 lot #: _____	

S₂

3/3

Sample Receipt Checklist

S2 Work Order# 2310194

Client: RockTasmanian

Client Project ID: Howard 14-18 wellhead

Shipped Via: H.D./P.U./FedEx/UPS/USPS/Other

Airbill #: _____

<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	-------------------------------------	--------------------------	--------------------------	--------------------------

Matrix (Check all that apply)

Air

Solid

Water

Other

Temp (°C)

9.4

Thermometer #

1

	Yes	No	N/A	Comments (if any)
If samples require cooling, is the temperature < 6°C? ⁽¹⁾ NOTE: If samples are delivered the same day of sampling, this requirement is met if there is evidence that cooling has begun.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If custody seals are present, are they intact? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>OK</u>
Are samples due within 48 hours present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Are water samples with short hold times present? Note the short hold analysis in the comments column - pH, Nitrate/Nitrite, Ferrous Iron (Fe ²⁺), Hexavalent Chromium (Cr ⁶⁺ , Cr VI), COD/BOD, Total Coliform, E. Coli, Total Residual Chlorine (TRC), Dissolved Oxygen	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is a chain-of-custody (COC) form present and filled out completely? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client w/ date and time recorded? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Were all samples received intact? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC? ⁽¹⁾	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>many labels were difficult to read</u>
For volatiles in water - is there headspace present? If yes, contact client and note in narrative.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are samples preserved that require preservation (excluding cooling)? ⁽¹⁾ Note the type of preservative in the comments column - HCl, H ₂ SO ₄ , NaOH, HNO ₃ , etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If samples are acid preserved for metals, is the pH ≤ 2? ⁽¹⁾ Record the pH in Comments.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
If dissolved metals are requested, were samples field filtered?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Additional Comments (if any): <u>all bags</u>				

⁽¹⁾ If NO, then contact the client before proceeding with analysis and note in case narrative.

AS

Custodian Printed Name

10/10/23

Date/Time

25 23



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

SB01@8.5'
2310194-01 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 10:00**


Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Arsenic	0.494	0.200	mg/kg dry	1	BGK0133	11/03/23	11/06/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 10:00**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
% Solids	96.1		%	1	BGK0032	11/01/23	11/02/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

SB02@5'
2310194-05 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 13:54**


Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Arsenic	0.707	0.200		mg/kg dry	1	BGK0133	11/03/23	11/06/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 13:54**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
% Solids	94.6			%	1	BGK0032	11/01/23	11/02/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

SB02@6'
2310194-06 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 13:56**


Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Arsenic	0.690	0.200	mg/kg dry	1	BGK0658	11/17/23	11/18/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 13:56**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
% Solids	97.3		%	1	BGK0539	11/15/23	11/15/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

SB02@7'
2310194-07 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 13:58**


Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Arsenic	0.498	0.200	mg/kg dry	1	BGL0028	12/01/23	12/02/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 13:58**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
% Solids	99.4		%	1	BGK1146	11/30/23	11/30/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

SB03@5'
2310194-09 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 12:02**


Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Arsenic	1.77	0.200	mg/kg dry	1	BGK0133	11/03/23	11/06/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 12:02**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
% Solids	95.8		%	1	BGK0032	11/01/23	11/02/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

SB03@6'
2310194-10 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 12:04**


Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Arsenic	1.54	0.200	mg/kg dry	1	BGK0658	11/17/23	11/18/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 12:04**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
% Solids	99.4		%	1	BGK0539	11/15/23	11/15/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

SB03@7'
2310194-11 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 12:06**


Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Arsenic	0.674	0.200	mg/kg dry	1	BGL0028	12/01/23	12/02/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 12:06**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
% Solids	99.5		%	1	BGK1146	11/30/23	11/30/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

SB04@5'
2310194-13 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 11:02**


Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Arsenic	0.737	0.200	mg/kg dry	1	BGK0133	11/03/23	11/06/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 11:02**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
% Solids	97.6		%	1	BGK0032	11/01/23	11/02/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

SB04@6'
2310194-14 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 11:05**


Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Arsenic	0.629	0.200	mg/kg dry	1	BGK0658	11/17/23	11/18/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 11:05**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
% Solids	99.0		%	1	BGK0539	11/15/23	11/15/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

SB04@8'
2310194-15 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 11:10**


Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Arsenic	0.309	0.200	mg/kg dry	1	BGL0028	12/01/23	12/02/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 11:10**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
% Solids	98.6		%	1	BGK1146	11/30/23	11/30/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

SB04@9'
2310194-16 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 11:12**


Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Arsenic	0.255	0.200	mg/kg dry	1	BGL0028	12/01/23	12/02/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 11:12**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
% Solids	98.8		%	1	BGK1146	11/30/23	11/30/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

SB05@5'
2310194-19 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 10:32**


Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Arsenic	0.999	0.200	mg/kg dry	1	BGK0133	11/03/23	11/06/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 10:32**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
% Solids	97.0		%	1	BGK0032	11/01/23	11/02/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

BKG02@2.5'
2310194-20 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 11:15**


Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Arsenic	1.10	0.200	mg/kg dry	1	BGJ0664	10/17/23	10/19/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 11:15**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
% Solids	97.6		%	1	BGJ0695	10/17/23	10/17/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

BKG02@5'
2310194-21 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 11:17**


Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Arsenic	0.391	0.200	mg/kg dry	1	BGJ0665	10/17/23	10/20/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 11:17**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
% Solids	97.6		%	1	BGJ0695	10/17/23	10/17/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

BKG02@6'
2310194-22 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 11:19**


Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Arsenic	0.238	0.200		mg/kg dry	1	BGJ0665	10/17/23	10/20/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 11:19**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
% Solids	97.6			%	1	BGJ0695	10/17/23	10/17/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

BKG02@8'
2310194-23 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 11:21**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Arsenic	0.329	0.200		mg/kg dry	1	BGJ0665	10/17/23	10/20/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 11:21**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
% Solids	96.6			%	1	BGJ0695	10/17/23	10/17/23	Calculation	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

BKG02@9'
2310194-24 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 11:23**


Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Arsenic	0.362	0.200		mg/kg dry	1	BGJ0665	10/17/23	10/20/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 11:23**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
% Solids	94.4			%	1	BGJ0696	10/17/23	10/17/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

BKG02@10'
2310194-25 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 11:25**


Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Arsenic	0.495	0.200		mg/kg dry	1	BGJ0665	10/17/23	10/20/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 11:25**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
% Solids	74.7			%	1	BGJ0696	10/17/23	10/17/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

BKG03@2.5'
2310194-26 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 10:41**


Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Arsenic	ND	0.200	mg/kg dry	1	BGJ0665	10/17/23	10/20/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 10:41**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
% Solids	98.5		%	1	BGJ0696	10/17/23	10/17/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

BKG03@5'
2310194-27 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 10:42**


Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Arsenic	0.310	0.200		mg/kg dry	1	BGJ0665	10/17/23	10/20/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 10:42**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
% Solids	98.2			%	1	BGJ0696	10/17/23	10/17/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

BKG03@6'
2310194-28 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 10:43**


Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Arsenic	0.347	0.200		mg/kg dry	1	BGJ0665	10/17/23	10/20/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 10:43**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
% Solids	98.3			%	1	BGJ0696	10/17/23	10/17/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

BKG03@8'
2310194-29 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 10:44**


Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Arsenic	0.328	0.200		mg/kg dry	1	BGJ0665	10/17/23	10/20/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 10:44**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
% Solids	97.7			%	1	BGJ0696	10/17/23	10/17/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

BKG03@9'
2310194-30 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 10:45**


Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Arsenic	0.244	0.200	mg/kg dry	1	BGJ0665	10/17/23	10/20/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 10:45**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
% Solids	96.9		%	1	BGJ0696	10/17/23	10/17/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

BKG03@10'
2310194-31 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 10:46**


Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Arsenic	0.326	0.200		mg/kg dry	1	BGJ0665	10/17/23	10/20/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 10:46**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
% Solids	97.6			%	1	BGJ0696	10/17/23	10/17/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

BKG04@2.5'
2310194-32 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 13:00**


Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Arsenic	0.369	0.200		mg/kg dry	1	BGJ0665	10/17/23	10/20/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 13:00**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
% Solids	97.6			%	1	BGJ0696	10/17/23	10/17/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

BKG04@5'
2310194-33 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 13:02**


Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Arsenic	0.214	0.200	mg/kg dry	1	BGJ0665	10/17/23	10/20/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 13:02**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
% Solids	97.6		%	1	BGJ0696	10/17/23	10/17/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

BKG04@6'
2310194-34 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 13:04**


Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Arsenic	0.268	0.200	mg/kg dry	1	BGJ0665	10/17/23	10/20/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 13:04**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
% Solids	97.6		%	1	BGJ0696	10/17/23	10/17/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

BKG04@8'
2310194-35 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 13:06**


Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Arsenic	ND	0.200	mg/kg dry	1	BGJ0665	10/17/23	10/20/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 13:06**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
% Solids	97.6		%	1	BGJ0696	10/17/23	10/17/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

BKG04@9'
2310194-36 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 13:09**


Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Arsenic	ND	0.200	mg/kg dry	1	BGJ0665	10/17/23	10/20/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 13:09**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
% Solids	98.2		%	1	BGJ0696	10/17/23	10/17/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

BKG04@10'
2310194-37 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 13:10**


Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Arsenic	0.213	0.200		mg/kg dry	1	BGJ0665	10/17/23	10/20/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 13:10**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
% Solids	97.8			%	1	BGJ0696	10/17/23	10/17/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

BKG05@2.5'
2310194-38 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 14:11**


Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Arsenic	0.549	0.200	mg/kg dry	1	BGJ0665	10/17/23	10/20/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 14:11**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
% Solids	90.8		%	1	BGJ0696	10/17/23	10/17/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

BKG05@5'
2310194-39 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 14:13**

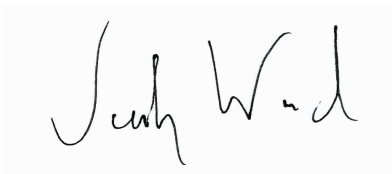
Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Arsenic	0.280	0.200		mg/kg dry	1	BGJ0665	10/17/23	10/20/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 14:13**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
% Solids	97.5			%	1	BGJ0696	10/17/23	10/17/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

BKG05@6'
2310194-40 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 14:15**


Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Arsenic	ND	0.200	mg/kg dry	1	BGJ0665	10/17/23	10/20/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 14:15**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
% Solids	95.5		%	1	BGJ0696	10/17/23	10/17/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

BKG05@8'
2310194-41 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 14:17**


Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Arsenic	0.915	0.200	mg/kg dry	1	BGJ0664	10/17/23	10/19/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 14:17**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
% Solids	98.3		%	1	BGJ0696	10/17/23	10/17/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

BKG05@9'
2310194-42 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 14:19**


Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Arsenic	1.36	0.200	mg/kg dry	1	BGJ0664	10/17/23	10/19/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 14:19**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
% Solids	98.2		%	1	BGJ0696	10/17/23	10/17/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

BKG05@10'
2310194-43 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Date Sampled: **10/10/23 14:21**


Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Arsenic	0.561	0.200	mg/kg dry	1	BGJ0664	10/17/23	10/19/23	EPA 6020B	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **10/10/23 14:21**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
% Solids	98.0		%	1	BGJ0696	10/17/23	10/17/23	Calculation	

Summit Scientific



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

Total Metals by EPA 6020B - Quality Control

Summit Scientific

Analyte	Result	Reporting		Spike Level	Source		%REC		RPD		Notes
		Limit	Units		Result	%REC	Limits	RPD	Limit		

Batch BGJ0664 - EPA 3050B

Blank (BGJ0664-BLK1) Prepared: 10/17/23 Analyzed: 10/19/23

Arsenic	ND	0.200	mg/kg wet								
---------	----	-------	-----------	--	--	--	--	--	--	--	--

LCS (BGJ0664-BS1) Prepared: 10/17/23 Analyzed: 10/19/23

Arsenic	40.2	0.200	mg/kg wet	40.0	100	80-120					
---------	------	-------	-----------	------	-----	--------	--	--	--	--	--

Duplicate (BGJ0664-DUP1) Source: 2310192-01 Prepared: 10/17/23 Analyzed: 10/19/23

Arsenic	2.35	0.200	mg/kg dry		2.12		10.0	20			
---------	------	-------	-----------	--	------	--	------	----	--	--	--

Matrix Spike (BGJ0664-MS1) Source: 2310192-01 Prepared: 10/17/23 Analyzed: 10/19/23

Arsenic	45.6	0.200	mg/kg dry	41.8	2.12	104	75-125				
---------	------	-------	-----------	------	------	-----	--------	--	--	--	--

Matrix Spike Dup (BGJ0664-MSD1) Source: 2310192-01 Prepared: 10/17/23 Analyzed: 10/19/23

Arsenic	44.9	0.200	mg/kg dry	41.8	2.12	102	75-125	1.61	25		
---------	------	-------	-----------	------	------	-----	--------	------	----	--	--

Batch BGJ0665 - EPA 3050B

Blank (BGJ0665-BLK1) Prepared: 10/17/23 Analyzed: 10/20/23

Arsenic	ND	0.200	mg/kg wet								
---------	----	-------	-----------	--	--	--	--	--	--	--	--

LCS (BGJ0665-BS1) Prepared: 10/17/23 Analyzed: 10/20/23

Arsenic	43.9	0.200	mg/kg wet	40.0	110	80-120					
---------	------	-------	-----------	------	-----	--------	--	--	--	--	--

Duplicate (BGJ0665-DUP1) Source: 2310194-21 Prepared: 10/17/23 Analyzed: 10/20/23

Arsenic	0.354	0.200	mg/kg dry		0.391		10.1	20			
---------	-------	-------	-----------	--	-------	--	------	----	--	--	--

Matrix Spike (BGJ0665-MS1) Source: 2310194-21 Prepared: 10/17/23 Analyzed: 10/20/23

Arsenic	21.6	0.200	mg/kg dry	41.0	0.391	51.6	75-125				QM-07
---------	------	-------	-----------	------	-------	------	--------	--	--	--	-------

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

Total Metals by EPA 6020B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD		Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit		

Batch BGJ0665 - EPA 3050B

Matrix Spike Dup (BGJ0665-MSD1)		Source: 2310194-21			Prepared: 10/17/23 Analyzed: 10/20/23						
Arsenic	21.8	0.200	mg/kg dry	41.0	0.391	52.3	75-125	1.24	25	QM-07	

Batch BGK0133 - EPA 3050B

Blank (BGK0133-BLK1)					Prepared: 11/03/23 Analyzed: 11/06/23						
Arsenic	ND	0.200	mg/kg wet								

LCS (BGK0133-BS1)					Prepared: 11/03/23 Analyzed: 11/06/23						
Arsenic	46.2	0.200	mg/kg wet	40.0		115	80-120				

Duplicate (BGK0133-DUP1)		Source: 2310116-05			Prepared: 11/03/23 Analyzed: 11/06/23						
Arsenic	2.54	0.200	mg/kg dry		2.21			13.9	20		

Matrix Spike (BGK0133-MS1)		Source: 2310116-05			Prepared: 11/03/23 Analyzed: 11/06/23						
Arsenic	43.3	0.200	mg/kg dry	40.8	2.21	101	75-125				

Matrix Spike Dup (BGK0133-MSD1)		Source: 2310116-05			Prepared: 11/03/23 Analyzed: 11/06/23						
Arsenic	40.3	0.200	mg/kg dry	40.8	2.21	93.4	75-125	7.30	25		

Batch BGK0658 - EPA 3050B

Blank (BGK0658-BLK1)					Prepared: 11/17/23 Analyzed: 11/18/23						
Arsenic	ND	0.200	mg/kg wet								

LCS (BGK0658-BS1)					Prepared: 11/17/23 Analyzed: 11/18/23						
Arsenic	38.8	0.200	mg/kg wet	40.0		97.1	80-120				

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

Total Metals by EPA 6020B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source		%REC		RPD		Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit		

Batch BGK0658 - EPA 3050B

Duplicate (BGK0658-DUP1)											
			Source: 2310194-06			Prepared: 11/17/23 Analyzed: 11/18/23					
Arsenic	0.660	0.200	mg/kg dry		0.690				4.44	20	
Matrix Spike (BGK0658-MS1)											
			Source: 2310194-06			Prepared: 11/17/23 Analyzed: 11/18/23					
Arsenic	38.9	0.200	mg/kg dry	41.1	0.690	92.8	75-125				
Matrix Spike Dup (BGK0658-MSD1)											
			Source: 2310194-06			Prepared: 11/17/23 Analyzed: 11/18/23					
Arsenic	40.0	0.200	mg/kg dry	41.1	0.690	95.6	75-125	2.85	25		
Post Spike (BGK0658-PS1)											
			Source: 2310194-06			Prepared: 11/17/23 Analyzed: 11/18/23					
Arsenic	97.3		ug/l	100	1.68	95.6	75-125				

Batch BGL0028 - EPA 3050B

Blank (BGL0028-BLK1)											
						Prepared: 12/01/23 Analyzed: 12/02/23					
Arsenic	ND	0.200	mg/kg wet								
LCS (BGL0028-BS1)											
						Prepared: 12/01/23 Analyzed: 12/02/23					
Arsenic	44.0	0.200	mg/kg wet	40.0		110	80-120				
Duplicate (BGL0028-DUP1)											
			Source: 2310194-07			Prepared: 12/01/23 Analyzed: 12/02/23					
Arsenic	0.492	0.200	mg/kg dry		0.498			1.14	20		
Matrix Spike (BGL0028-MS1)											
			Source: 2310194-07			Prepared: 12/01/23 Analyzed: 12/02/23					
Arsenic	22.0	0.200	mg/kg dry	40.2	0.498	53.6	75-125				QM-07
Matrix Spike Dup (BGL0028-MSD1)											
			Source: 2310194-07			Prepared: 12/01/23 Analyzed: 12/02/23					
Arsenic	22.0	0.200	mg/kg dry	40.2	0.498	53.5	75-125	0.0146	25		QM-07

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

Physical Parameters by APHA/ASTM/EPA Methods - Quality Control

Summit Scientific

Analyte	Result	Reporting		Spike Level	Source		%REC		RPD		Notes
		Limit	Units		Result	%REC	Limits	RPD	Limit		

Batch BGJ0695 - General Preparation

Duplicate (BGJ0695-DUP1)		Source: 2310192-01			Prepared & Analyzed: 10/17/23						
% Solids	95.1		%		95.6				0.480	20	

Batch BGJ0696 - General Preparation

Duplicate (BGJ0696-DUP1)		Source: 2310194-24			Prepared & Analyzed: 10/17/23						
% Solids	95.5		%		94.4				1.21	20	

Batch BGK0032 - General Preparation

Duplicate (BGK0032-DUP1)		Source: 2309512-01			Prepared: 11/01/23 Analyzed: 11/02/23						
% Solids	92.0		%		91.6				0.373	20	

Batch BGK0539 - General Preparation

Duplicate (BGK0539-DUP1)		Source: 2310194-06			Prepared & Analyzed: 11/15/23						
% Solids	97.5		%		97.3				0.255	20	

Batch BGK1146 - General Preparation

Duplicate (BGK1146-DUP1)		Source: 2310194-07			Prepared & Analyzed: 11/30/23						
% Solids	99.4		%		99.4				0.00452	20	

Summit Scientific

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Tasman Geosciences
6855 W. 119th Ave.
Broomfield CO, 80020

Project: PDC - Howard 14-18 Wellhead

Project Number: [none]
Project Manager: Mark Longhurst

Reported:
12/05/23 09:00

Notes and Definitions

QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS/LCSD recovery.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference