

Wellhead Closure Checklist

COGCC Rule 911.a.(4) Environmental Site Closure Assessment Field Form

Additional attachments (optional):		Pit Closure		Tank Battery Closure		Flowline Closure		Partially Buried Vault Closure	
Site Name & COGCC Facility Number: Patriot B16-25		Date: 10/20/2022, 01/03/2023						Remediation Project #: 25024	
Associated Wells:		Age of Site:						Number of Photos Attached: 5	
Location: (GPS coordinates of wellhead or southeastern most wellhead for multiple) 40.4722761, -104.7136508							Estimated Facility Size (acres):		
General Condition of Site: (General observations regarding housekeeping, corrosion, waste management, etc.) Clean, no signs of impacts									
USCS Soil Type: Poorly graded sand				Estimated Depth to Groundwater:					
Hydrocarbon Impacted Soils / Spills: (Note estimated size and if impact appears to be surficial or extends to an unknown depth) None Observed									
Salt Crusted Soils or Impacted Vegetation: (Note estimated size and if impact appears to be surficial or extends to an unknown depth) None Observed									
Wellhead(s)									
Well API	05-123-24628								
Age									
Condition of surface around wellhead	good								
PID Readings	0.1-1.1								
Condition of subsurface (staining present)	no staining present								
PID Readings	0.1-1.1								
Sample taken? Location/Sample ID#	yes, see below								
Photo Number(s)	1-5								
Other observations regarding wellheads:									
Summary									
Was impacted soil identified? No Yes - less than 10 cubic yards Yes - more than 10 cubic yards									
Total number of samples field screened: 5				Total number of samples collected: 5					
Highest PID Reading: 1.1				Total number of samples submitted to lab for analysis: 2					
If more than 10 cubic yards of impacted soil were observed:									
Vertical extent:				Estimated spill volume:					
Lateral extent:				Volume of soil removed:					
Is additional investigation required?									
Was groundwater encountered during the investigation? No Yes - not impacted or in contact with impacted soils Yes - groundwater impacted and/or in contact with impacted soils									
Measured depth to groundwater:				Was remedial groundwater removal conducted? Yes No					
Date Groundwater was encountered:				Commencement date of removal:					
Sheen on groundwater? Yes No				Volume of groundwater removed prior to sampling:					
Free product observed? Yes No				Volume of groundwater removed post sampling:					
Total number of samples collected:				Total Volume of groundwater removed:					
Total number of samples submitted to lab for analysis:									

Photographic Log



Equipment ID: SS01 @2.5'		Equipment Type:		Equipment ID: SS02 @2.5'		Equipment Type:	
Material:	Volume:	Contents:		Material:	Volume:	Contents:	
Notes/Conditions:				Notes/Conditions:			

Photographic Log



Equipment ID: SS03@2.5'		Equipment Type:		Equipment ID: SS04@2.5'		Equipment Type:	
Material:	Volume:	Contents:		Material:	Volume:	Contents:	
Notes/Conditions:				Notes/Conditions:			

Photographic Log



Equipment ID: FS01@7		Equipment Type:		Equipment ID:		Equipment Type:	
Material:	Volume:	Contents:		Material:	Volume:	Contents:	
Notes/Conditions:				Notes/Conditions:			

TABLE 1
SOIL SAMPLE LOCATIONS
NOBLE ENERGY, INC. - PATRIOT B16-25 WH

Soil Sample ID	Date	PID (ppm)	Visual	Olfactory	Sample Type (Grab/Lab)	Latitude ¹	Longitude	PDOP
SS01@2.5'	10/20/22	0.2	No Staining	No Odor	Grab	40.39612455	-104.5591853	1.1
SS02@2.5'	10/20/22	0.5	No Staining	No Odor	Grab	40.39610121	-104.5591573	1.1
SS03@2.5'	10/20/22	1.1	No Staining	No Odor	Grab	40.39608095	-104.5591773	1.1
SS04@2.5'	10/20/22	0.6	No Staining	No Odor	Grab	40.39611092	-104.5592064	1.2
FS01@7'	10/20/22	0.1	No Staining	No Odor	Lab	40.39610789	-104.5591813	1.1

Notes:

PID = Photo-ionization detector

ppm = parts per million

PDOP = Position dilution of precision

HC = Hydrocarbon

1.) Latitude and longitude coordinates will be provided in decimal degrees with an accuracy and precision of 5 decimals of a degree using the North American Datum ("NAD") of 1983

TABLE 2
SOIL ANALYTICAL DATA
NOBLE ENERGY, INC. - PATRIOT B16-25

Soil Sample ID	Date	¹ 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-GRO (mg/kg)	TPH-DRO (mg/kg)	TPH-ORO (mg/kg)	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 ²		1.2	490	5.8	58	30	27	2	500			360	1,800	1.1	0.11	1.1	11	110	0.11	240	240	1.1	180	18	24
Protection of Groundwater SSL ^{2,3}		0.0026	0.69	0.78	9.9	0.0081	0.0087	0.0038	500			0.55	6	0.011	0.24	0.3	2.9	9	0.096	8.9	0.54	0.98	1.3	0.006	0.019
SS03@2.5'	01/03/23	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<0.50	<50	<50	<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
FS01@7'	01/03/23	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<0.50	<50	<50	<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

Soil Sample ID	Date	pH	SAR	EC (mmhos/cm)	Boron (mg/L)
Residential SSL ²		6 - 8.3	<6	<4mmhos/cm	2
SS03@2.5'	01/03/23	8.53	0.536	0.258	0.107
FS01@7'	01/03/23	8.66	0.344	0.130	<0.0100

Notes:

- Compounds referenced from 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.

Definitions:

COGCC = Colorado Oil and Gas Conservation Commission

TPH-GRO = Total petroleum hydrocarbons - gasoline range organics

TPH-DRO = Total petroleum hydrocarbons - diesel range organics

TPH-ORO = Total petroleum hydrocarbons - oil range organics

mg/kg = Milligrams per kilogram

SAR = Sodium Adsorption Ratio

EC = Electrical Conductivity

mmhos/cm = Millimhos per centimeter

mg/L = Milligrams per liter

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

Highlighted results are equal to or exceed the COGCC Table 915-1 standard

1,2,4 - TMB = 1,2,4 Trimethylbenzene

1,3,5 - TMB = 1,3,5 Trimethylbenzene

Benz(a) = Benzanthracene

Benzo(b) = Benzofluoranthene

Benzo(k) = Benzofluoranthene

Benzo(a) = Benzopyrene

A,H = Dibenzoanthracene

1,2,3-CD = Indenopyrene

1-M = 1-methylnaphthalene

2-M = 2-methylnaphthalene



DATE:	11/18/2022
DESIGNED BY:	JW
DRAWN BY:	HM



TASMAN Tasman Geosciences, Inc.
6855 W 119th Avenue
Broomfield, CO 80020

Noble Energy, Inc. – DJ Basin
Patriot B16-25 Wellhead
NESW, Section 16, Township 5 North, Range 64 West
Weld County, Colorado

Wellhead Closure & Soil
Analytical Results Map
(10/20/2022&01/03/2023)

FIGURE
1

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

January 09, 2023

Jacob Whritenour
Tasman Geosciences
6855 W. 119th Ave.
Broomfield, CO 80020
RE: Noble - Patriot B16-25
Work Order #2301017

Enclosed are the results of analyses for samples received by Summit Scientific on 01/03/23 17:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Mikayla Axtell For Paul Shrewsbury
President



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

Project: Noble - Patriot B16-25

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/09/23 16:08

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FS01@7'	2301017-01	Soil	01/03/23 11:15	01/03/23 17:00
SS03@2.5'	2301017-02	Soil	01/03/23 11:25	01/03/23 17:00

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

2301017

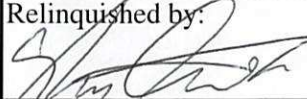
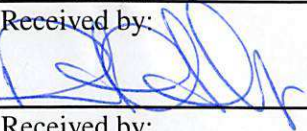
S₂

4653 Table Mountain Drive ♦ Golden, Colorado 80403
303-277-9310

Page 1 of 1

Client: Noble / Tasman Project Manager: Jake Whritenour Invoice: Dan Peterson
 Address: 6855 W. 119th Ave E-Mail: jwhritenour@tasman-geo.com
 City/State/Zip: Broomfield, CO 80020
 Phone: 303-261-6246 Project Name: Patriot Big-25
 Sampler Name: Stanley Gilbert Project Number:

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix				Analysis Requested						Special Instructions
					HCl	HNO3	None	Other	Water	Soil	Air-Canister #	Other	VOC - 915	TPH - 915	PAH - 915	pH, EC, SAR	Boron - HWS	HOLD	
1	F307@7'	11/3/23	11:15	2			X		X				X	X	X	X	X		pH, EC, SAR by saturated paste
2	SS03@2.5'	11/3/23	11:25	2			X		X				X	X	X	X	X		
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			

Relinquished by: 	Date/Time: 11/3/23 1515	Received by: Tasman's Lock Box Summit	Date/Time: 11/3/23 1515	Turn Around Time (Check) Same Day _____ 72 hours 24 hours _____ Standard <input checked="" type="checkbox"/> 48 hours _____ Sample Integrity: Temperature Upon Receipt: <u>7.8</u> Samples Intact: <input checked="" type="radio"/> Yes <input type="radio"/> No	Notes:
Relinquished by: Tasman's Lock Box	Date/Time: 1/3/23 1700	Received by: 	Date/Time: 1/3/23 1700		
Relinquished by:	Date/Time:	Received by:	Date/Time:		

S₂

Sample Receipt Checklist

S2 Work Order# 2301012

Client: Noble/Asman Client Project ID: Patriot B16-25

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

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

Temp (°C) 7.8 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"/>	<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 checked="" 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

1-3-23
Date/Time



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

Project: Noble - Patriot B16-25

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/09/23 16:08

FS01@7'
2301017-01 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/03/23 11:15**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	0.0020		mg/kg	1	BGA0038	01/04/23	01/04/23	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: **01/03/23 11:15**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4	0.0404	101 %		50-150		"	"	"	"	
Surrogate: Toluene-d8	0.0416	104 %		50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0443	111 %		50-150		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **01/03/23 11:15**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
C10-C28 (DRO)	ND	50		mg/kg	1	BGA0041	01/04/23	01/04/23	EPA 8015M	
C28-C36 (ORO)	ND	50		"	"	"	"	"	"	

Date Sampled: **01/03/23 11:15**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: o-Terphenyl	15.5	124 %		30-150		"	"	"	"	

PAH by EPA Method 8270D SIM

Summit Scientific

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

Project: Noble - Patriot B16-25

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/09/23 16:08

FS01@7'
2301017-01 (Soil)

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **01/03/23 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BGA0034	01/04/23	01/04/23	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: **01/03/23 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10	0.0215	64.5 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10	0.0231	69.2 %	40-150		"	"	"	"	

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **01/03/23 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	ND	0.0100	mg/L	1	BGA0080	01/05/23	01/05/23	EPA 6020B	

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

Date Sampled: **01/03/23 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Summit Scientific

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

Project: Noble - Patriot B16-25

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/09/23 16:08

FS01@7'
2301017-01 (Soil)

Summit Scientific

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	13.5	0.0514	mg/L dry	1	BGA0036	01/04/23	01/05/23	EPA 6020B	
Magnesium	5.87	0.0514	"	"	"	"	"	"	
Sodium	6.03	0.0514	"	"	"	"	"	"	

Calculated Analysis

Date Sampled: **01/03/23 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.344	0.00100	units	1	BGA0098	01/06/23	01/06/23	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **01/03/23 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	97.4		%	1	BGA0051	01/04/23	01/04/23	Calculation	

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **01/03/23 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.130	0.0100	mmhos/cm	1	BGA0072	01/05/23	01/05/23	EPA 120.1	

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

Date Sampled: **01/03/23 11:15**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	8.66		pH Units	1	BGA0071	01/05/23	01/05/23	EPA 9045D	

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

Project: Noble - Patriot B16-25

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/09/23 16:08

SS03@2.5'
2301017-02 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **01/03/23 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	BGA0038	01/04/23	01/04/23	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: **01/03/23 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	0.0414	104 %	50-150		"	"	"	"	
Surrogate: Toluene-d8	0.0417	104 %	50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0447	112 %	50-150		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **01/03/23 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	BGA0041	01/04/23	01/04/23	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **01/03/23 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl	15.1	121 %	30-150		"	"	"	"	

PAH by EPA Method 8270D SIM

Summit Scientific

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

Project: Noble - Patriot B16-25

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/09/23 16:08

SS03@2.5'
2301017-02 (Soil)

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **01/03/23 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BGA0034	01/04/23	01/05/23	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: **01/03/23 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10	0.0194	58.3 %	40-150		"	"	"	"	
Surrogate: Fluoranthene-d10	0.0219	65.6 %	40-150		"	"	"	"	

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **01/03/23 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	0.107	0.0100	mg/L	1	BGA0080	01/05/23	01/05/23	EPA 6020B	

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

Date Sampled: **01/03/23 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Patriot B16-25

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/09/23 16:08

SS03@2.5'
2301017-02 (Soil)

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	33.3	0.0509	mg/L dry	1	BGA0036	01/04/23	01/05/23	EPA 6020B	
Magnesium	7.23	0.0509	"	"	"	"	"	"	
Sodium	13.1	0.0509	"	"	"	"	"	"	

Calculated Analysis

Date Sampled: **01/03/23 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.536	0.00100	units	1	BGA0098	01/06/23	01/06/23	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **01/03/23 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
% Solids	98.2		%	1	BGA0051	01/04/23	01/04/23	Calculation	

Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **01/03/23 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.258	0.0100	mmhos/cm	1	BGA0072	01/05/23	01/05/23	EPA 120.1	

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

Date Sampled: **01/03/23 11:25**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	8.53		pH Units	1	BGA0071	01/05/23	01/05/23	EPA 9045D	

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Project: Noble - Patriot B16-25

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/09/23 16:08

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Summit Scientific

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

Batch BGA0038 - EPA 5030 Soil MS

Blank (BGA0038-BLK1)

Prepared & Analyzed: 01/04/23

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	"								
Surrogate: 1,2-Dichloroethane-d4	0.0428		"	0.0400		107	50-150				
Surrogate: Toluene-d8	0.0417		"	0.0400		104	50-150				
Surrogate: 4-Bromofluorobenzene	0.0441		"	0.0400		110	50-150				

LCS (BGA0038-BS1)

Prepared & Analyzed: 01/04/23

Benzene	0.138	0.0020	mg/kg	0.125		110	70-130				
Toluene	0.142	0.0050	"	0.125		113	70-130				
Ethylbenzene	0.125	0.0050	"	0.125		100	70-130				
m,p-Xylene	0.243	0.010	"	0.250		97.2	70-130				
o-Xylene	0.118	0.0050	"	0.125		94.1	70-130				
1,2,4-Trimethylbenzene	0.129	0.0050	"	0.125		103	70-130				
1,3,5-Trimethylbenzene	0.131	0.0050	"	0.125		105	70-130				
Naphthalene	0.110	0.0038	"	0.125		88.0	70-130				
Surrogate: 1,2-Dichloroethane-d4	0.0416		"	0.0400		104	50-150				
Surrogate: Toluene-d8	0.0426		"	0.0400		106	50-150				
Surrogate: 4-Bromofluorobenzene	0.0415		"	0.0400		104	50-150				

Matrix Spike (BGA0038-MS1)

Source: 2301015-01

Prepared & Analyzed: 01/04/23

Benzene	0.137	0.0020	mg/kg	0.125	ND	110	70-130				
Toluene	0.145	0.0050	"	0.125	ND	116	70-130				
Ethylbenzene	0.129	0.0050	"	0.125	ND	103	70-130				
m,p-Xylene	0.246	0.010	"	0.250	ND	98.3	70-130				
o-Xylene	0.122	0.0050	"	0.125	ND	97.3	70-130				
1,2,4-Trimethylbenzene	0.134	0.0050	"	0.125	ND	107	70-130				
1,3,5-Trimethylbenzene	0.134	0.0050	"	0.125	ND	107	70-130				
Naphthalene	0.118	0.0038	"	0.125	ND	94.6	70-130				
Surrogate: 1,2-Dichloroethane-d4	0.0420		"	0.0400		105	50-150				
Surrogate: Toluene-d8	0.0429		"	0.0400		107	50-150				
Surrogate: 4-Bromofluorobenzene	0.0422		"	0.0400		105	50-150				

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Project: Noble - Patriot B16-25

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/09/23 16:08

Volatile Organic Compounds by EPA Method 8260B - Quality Control

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

Batch BGA0038 - EPA 5030 Soil MS

Matrix Spike Dup (BGA0038-MSD1)	Source: 2301015-01			Prepared & Analyzed: 01/04/23						
Benzene	0.135	0.0020	mg/kg	0.125	ND	108	70-130	1.59	30	
Toluene	0.142	0.0050	"	0.125	ND	113	70-130	2.45	30	
Ethylbenzene	0.122	0.0050	"	0.125	ND	97.4	70-130	5.63	30	
m,p-Xylene	0.237	0.010	"	0.250	ND	94.6	70-130	3.78	30	
o-Xylene	0.116	0.0050	"	0.125	ND	93.1	70-130	4.44	30	
1,2,4-Trimethylbenzene	0.128	0.0050	"	0.125	ND	103	70-130	4.42	30	
1,3,5-Trimethylbenzene	0.128	0.0050	"	0.125	ND	103	70-130	3.94	30	
Naphthalene	0.118	0.0038	"	0.125	ND	94.3	70-130	0.381	30	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0427</i>		<i>"</i>	<i>0.0400</i>		<i>107</i>	<i>50-150</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0431</i>		<i>"</i>	<i>0.0400</i>		<i>108</i>	<i>50-150</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0418</i>		<i>"</i>	<i>0.0400</i>		<i>105</i>	<i>50-150</i>			

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Project: Noble - Patriot B16-25

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/09/23 16:08

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 BGA0041 - EPA 3550A

Blank (BGA0041-BLK1)

Prepared & Analyzed: 01/04/23

C10-C28 (DRO)	ND	50	mg/kg								
C28-C36 (ORO)	ND	50	"								
Surrogate: <i>o</i> -Terphenyl	15.8		"	12.5		126		30-150			

LCS (BGA0041-BS1)

Prepared & Analyzed: 01/04/23

C10-C28 (DRO)	513	50	mg/kg	500		103		70-130			
Surrogate: <i>o</i> -Terphenyl	16.8		"	12.5		134		30-150			

Matrix Spike (BGA0041-MS1)

Source: 2301015-01

Prepared & Analyzed: 01/04/23

C10-C28 (DRO)	510	50	mg/kg	500	11.9	99.6		70-130			
Surrogate: <i>o</i> -Terphenyl	16.3		"	12.5		130		30-150			

Matrix Spike Dup (BGA0041-MSD1)

Source: 2301015-01

Prepared & Analyzed: 01/04/23

C10-C28 (DRO)	486	50	mg/kg	500	11.9	94.8		70-130	4.79	20	
Surrogate: <i>o</i> -Terphenyl	16.2		"	12.5		130		30-150			

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Project: Noble - Patriot B16-25

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/09/23 16:08

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 BGA0034 - EPA 5030 Soil MS

Blank (BGA0034-BLK1)

Prepared & Analyzed: 01/04/23

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	"							
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0257</i>		"	<i>0.0333</i>		<i>77.1</i>	<i>40-150</i>			
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0324</i>		"	<i>0.0333</i>		<i>97.2</i>	<i>40-150</i>			

LCS (BGA0034-BS1)

Prepared & Analyzed: 01/04/23

Acenaphthene	0.0298	0.00500	mg/kg	0.0333		89.5	31-137			
Anthracene	0.0310	0.00500	"	0.0333		93.0	30-120			
Benzo (a) anthracene	0.0303	0.00500	"	0.0333		90.9	30-120			
Benzo (a) pyrene	0.0305	0.00500	"	0.0333		91.5	30-120			
Benzo (b) fluoranthene	0.0306	0.00500	"	0.0333		91.8	30-120			
Benzo (k) fluoranthene	0.0308	0.00500	"	0.0333		92.3	30-120			
Chrysene	0.0321	0.00500	"	0.0333		96.3	30-120			
Dibenz (a,h) anthracene	0.0287	0.00500	"	0.0333		86.1	30-120			
Fluoranthene	0.0306	0.00500	"	0.0333		91.7	30-120			
Fluorene	0.0304	0.00500	"	0.0333		91.1	30-120			
Indeno (1,2,3-cd) pyrene	0.0311	0.00500	"	0.0333		93.2	30-120			
Pyrene	0.0316	0.00500	"	0.0333		94.8	35-142			
1-Methylnaphthalene	0.0300	0.00500	"	0.0333		89.9	35-142			
2-Methylnaphthalene	0.0262	0.00500	"	0.0333		78.7	35-142			
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0303</i>		"	<i>0.0333</i>		<i>91.0</i>	<i>40-150</i>			
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0329</i>		"	<i>0.0333</i>		<i>98.6</i>	<i>40-150</i>			

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Project: Noble - Patriot B16-25

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/09/23 16:08

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 BGA0034 - EPA 5030 Soil MS

Matrix Spike (BGA0034-MS1)	Source: 2212574-01			Prepared & Analyzed: 01/04/23						
Acenaphthene	0.0196	0.00500	mg/kg	0.0333	ND	58.9	31-137			
Anthracene	0.0206	0.00500	"	0.0333	ND	61.8	30-120			
Benzo (a) anthracene	0.0211	0.00500	"	0.0333	ND	63.3	30-120			
Benzo (a) pyrene	0.0209	0.00500	"	0.0333	ND	62.7	30-120			
Benzo (b) fluoranthene	0.0213	0.00500	"	0.0333	ND	63.8	30-120			
Benzo (k) fluoranthene	0.0216	0.00500	"	0.0333	ND	64.7	30-120			
Chrysene	0.0213	0.00500	"	0.0333	ND	64.0	30-120			
Dibenz (a,h) anthracene	0.0190	0.00500	"	0.0333	ND	57.0	30-120			
Fluoranthene	0.0208	0.00500	"	0.0333	ND	62.3	30-120			
Fluorene	0.0194	0.00500	"	0.0333	ND	58.3	30-120			
Indeno (1,2,3-cd) pyrene	0.0217	0.00500	"	0.0333	ND	65.2	30-120			
Pyrene	0.0219	0.00500	"	0.0333	ND	65.6	35-142			
1-Methylnaphthalene	0.0189	0.00500	"	0.0333	ND	56.8	15-130			
2-Methylnaphthalene	0.0177	0.00500	"	0.0333	ND	53.0	15-130			
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0204</i>		<i>"</i>	<i>0.0333</i>		<i>61.1</i>	<i>40-150</i>			
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0214</i>		<i>"</i>	<i>0.0333</i>		<i>64.2</i>	<i>40-150</i>			

Matrix Spike Dup (BGA0034-MSD1)	Source: 2212574-01			Prepared & Analyzed: 01/04/23						
Acenaphthene	0.0175	0.00500	mg/kg	0.0333	ND	52.5	31-137	11.4	30	
Anthracene	0.0177	0.00500	"	0.0333	ND	53.1	30-120	15.1	30	
Benzo (a) anthracene	0.0186	0.00500	"	0.0333	ND	55.8	30-120	12.6	30	
Benzo (a) pyrene	0.0177	0.00500	"	0.0333	ND	53.1	30-120	16.6	30	
Benzo (b) fluoranthene	0.0182	0.00500	"	0.0333	ND	54.5	30-120	15.7	30	
Benzo (k) fluoranthene	0.0183	0.00500	"	0.0333	ND	54.9	30-120	16.4	30	
Chrysene	0.0187	0.00500	"	0.0333	ND	56.1	30-120	13.1	30	
Dibenz (a,h) anthracene	0.0162	0.00500	"	0.0333	ND	48.6	30-120	15.9	30	
Fluoranthene	0.0180	0.00500	"	0.0333	ND	53.9	30-120	14.3	30	
Fluorene	0.0173	0.00500	"	0.0333	ND	51.8	30-120	11.9	30	
Indeno (1,2,3-cd) pyrene	0.0180	0.00500	"	0.0333	ND	54.1	30-120	18.7	30	
Pyrene	0.0186	0.00500	"	0.0333	ND	55.7	35-142	16.4	30	
1-Methylnaphthalene	0.0155	0.00500	"	0.0333	ND	46.4	15-130	20.3	50	
2-Methylnaphthalene	0.0157	0.00500	"	0.0333	ND	47.2	15-130	11.6	50	
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0176</i>		<i>"</i>	<i>0.0333</i>		<i>52.7</i>	<i>40-150</i>			
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0185</i>		<i>"</i>	<i>0.0333</i>		<i>55.4</i>	<i>40-150</i>			

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Project: Noble - Patriot B16-25

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/09/23 16:08

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 BGA0080 - EPA 3050B

Blank (BGA0080-BLK1)

Prepared & Analyzed: 01/05/23

Boron ND 0.0100 mg/L

LCS (BGA0080-BS1)

Prepared & Analyzed: 01/05/23

Boron 5.64 0.0100 mg/L 5.00 113 80-120

Duplicate (BGA0080-DUP1)

Source: 2212517-01

Prepared & Analyzed: 01/05/23

Boron 0.372 0.0100 mg/L 0.307 19.0 20

Matrix Spike (BGA0080-MS1)

Source: 2212517-01

Prepared & Analyzed: 01/05/23

Boron 5.03 0.0100 mg/L 5.00 0.307 94.5 75-125

Matrix Spike Dup (BGA0080-MSD1)

Source: 2212517-01

Prepared & Analyzed: 01/05/23

Boron 5.66 0.0100 mg/L 5.00 0.307 107 75-125 11.8 25

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Project: Noble - Patriot B16-25

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/09/23 16:08

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 BGA0036 - General Preparation

Blank (BGA0036-BLK1)

Prepared: 01/04/23 Analyzed: 01/05/23

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

LCS (BGA0036-BS1)

Prepared: 01/04/23 Analyzed: 01/05/23

Calcium	4.18	0.0500	mg/L wet	5.00	83.7	70-130				
Magnesium	4.80	0.0500	"	5.00	96.1	70-130				
Sodium	4.91	0.0500	"	5.00	98.3	70-130				

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Project: Noble - Patriot B16-25

Project Number: [none]
 Project Manager: Jacob Whritenour

Reported:
 01/09/23 16:08

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

Summit Scientific

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

Batch BGA0051 - General Preparation

Duplicate (BGA0051-DUP1)

Source: 2212211-01

Prepared & Analyzed: 01/04/23

% Solids	82.8		%		81.4			1.69	20	
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6855 W. 119th Ave.
Broomfield CO, 80020

Project: Noble - Patriot B16-25

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/09/23 16:08

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 BGA0072 - General Preparation

Blank (BGA0072-BLK1)

Prepared & Analyzed: 01/05/23

Specific Conductance (EC) ND 0.0100 mmhos/cm

LCS (BGA0072-BS1)

Prepared & Analyzed: 01/05/23

Specific Conductance (EC) 0.152 0.0100 mmhos/cm 0.150 102 95-105

Duplicate (BGA0072-DUP1)

Source: 2212211-01

Prepared & Analyzed: 01/05/23

Specific Conductance (EC) 0.651 0.0100 mmhos/cm 0.663 1.83 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: Noble - Patriot B16-25

Project Number: [none]
Project Manager: Jacob Whritenour

Reported:
01/09/23 16:08

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 BGA0071 - General Preparation

LCS (BGA0071-BS1)

Prepared & Analyzed: 01/05/23

pH	9.15	pH Units	9.18	99.7	95-105
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Duplicate (BGA0071-DUP1)

Source: 2212211-01

Prepared & Analyzed: 01/05/23

pH	7.65	pH Units	7.72	0.911	20
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Summit Scientific

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Reported:
01/09/23 16:08

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