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13 June 2025

Werning 7-2B

Remediation #17203

Operator NOBLE #100322

This Supplemental Site Investigation Report has been prepared by Environmental Resources Management, Inc. (ERM), on behalf of Noble Energy, Inc. (Noble), for Werning 7-2B, Remediation #17203.

BACKGROUND

Pursuant to ECMC Rule 911, a site investigation was conducted pertaining to the Werning 7-2B wellhead and flowline decommissioning. The wellhead was cut and capped per Colorado Energy and Carbon Management Commission (ECMC) rules. The flowline was abandoned-in-place on 6/30/2021, and the ECMC was notified on Form 44 Document # 402764111.

Confirmatory sampling conducted in June 2021 as part of initial wellhead and flowline closure activities did not reveal exceedances of ECMC Table 915-1 regulatory standards for soil or groundwater quality. Closure activities are documented in the Site Investigation and Remediation Work Plan (Supplemental Form 27), submitted to the ECMC on 19 March 2024, Document #402824262.

SITE INVESTIGATION ACTIVITIES

SOIL SAMPLING

On 7 April 2025, ERM conducted shallow delineation and background soil sampling using a hand auger along the flowline, as shown in **Figure 1**.

ERM advanced ten (10) soil borings (FL-01, FL-02, FL-03, FL-04, FL-05, FL-06, FL-07, FL-08, FL-09, FL-10) located along the abandoned-in-place flowline. Samples were collected at an interval of 4-feet below ground surface (bgs) at each respective boring location.

ERM advanced three soil borings (BG-01 through BG-03) to serve as nearby, non-impacted, sampling locations to evaluate background concentrations for the respective target analytes. All locations were sampled at 4-feet bgs.

A total of 13 soil samples, comprising 10 flowline samples and 3 background samples, were submitted to Pace Analytical Services, an accredited facility located in Mount Juliet, Tennessee for complete Table 915-1 analytical suite analysis except for background samples which were analyzed for Soil Suitability for Reclamation (SSR) and metals.

RESULTS

Analytical results from the April 2025 supplemental site investigation are detailed in **Table 1** and **Figure 1**. The complete encrypted analytical report from Pace Analytical Services is included as an attachment with the respective Form 27 submittal of this report.

Upon receipt of laboratory analytical results, data were reviewed for general quality control and quality assurance measures. The following key observations and data qualifiers were noted:

- The temperature of soil samples at the time of laboratory receipt was 0.6 degrees Celsius (°C), which is within the acceptable range of 0°C to 6°C. The samples were delivered on the same day as sampling, transported on bagged ice, and observed to be actively cooling upon arrival.
- All sample bottles were received intact, and samples analyzed within their respective hold times, except pH which are flagged T8.
- J qualifiers were flagged for some sample results, the reported value for that sample result is considered an estimate.

BACKGROUND SAMPLES

The following background samples exceed ECMC Table 915-1 for:

- Arsenic Residential Soil Screening Level (RSSL) standard of 0.29 milligrams per kilograms (mg/kg) for all samples, with results ranging from 0.581 to 2.57 mg/kg.
- Barium GSSL standard of 82 mg/kg at samples FL-01 and FL-04, with results ranging between 100 – 165 mg/kg.
- Chromium (IV) RSSL standard of 0.3 mg/kg at samples FL-01, FL-04, FL-06, FL-08, FL-09, and BG-03, with results ranging from 0.463 to 0.996 mg/kg.
- Lead Groundwater Soil Screening Level (GSSL) standard of 14 mg/kg at sample FL-01, with results of 15.3 mg/kg.
- Selenium GSSL standard of 0.26 mg/kg at samples FL-01, FL-02, FL-03, FL-04, FL-05, FL-06, FL-07, FL-08, FL-09, FL-10, BG-01, and BG-02, with results ranging between 0.360 and 1.45 mg/kg.

FLOWLINE SAMPLES

As shown in **Table 1** and **Figure 1**, the following flowline samples exceed ECMC Table 915-1 for:

- Arsenic GSSL standard of 0.29 milligrams per kilograms (mg/kg) for 10 of 10 samples with results ranging from 0.581 to 2.57 mg/kg. When compared to 1.25x maximum background value of 1.4625 mg/kg of nearby background samples, 4 of 10 samples are found to exceed 1.25x the maximum background value.
- Barium GSSL for 2 of 10 samples with results ranging between 100 – 165 mg/kg. When compared to 1.25x maximum background value of 48.125 mg/kg of nearby background samples, 2 of 10 flowline samples are found to exceed 1.25x the maximum background value.

- Chromium (IV) RSSL for 6 of 10 samples with results ranging from 0.463 to 0.996 mg/kg. When compared to 1.25x maximum background value of 0.84 mg/kg of nearby background samples, 2 of 10 flowline samples are found to still exceed 1.25x the maximum background value.
- Lead GSSL standard for 1 of 10 samples, with results of 15.3 mg/kg. When compared to 1.25x maximum background value of 5.9125 mg/kg of nearby background samples, 1 of 10 flowline samples are found to still exceed 1.25x the maximum background value.
- Selenium GSSL standard of for 10 of 10 flowline samples with results ranging between 0.360 and 1.45 mg/kg. When compared to 1.25x maximum background value of 0.7225 mg/kg of nearby background samples, 7 of 10 flowline samples are found to still exceed 1.25x the maximum background value.

NEXT STEPS

Due to soil impacts, ERM recommends further assessment of Arsenic, Barium, Chromium (IV), Lead, and Selenium from flowline samples for applicability to Soil Reclamation Criteria to be completed after flowline removal. Details of the supplemental investigation will be provided on a subsequent supplemental Form 27.



TABLE 1

Sample ID	BG-01	BG-02	BG-03	FL-01	FL-02	FL-03	FL-04	FL-05	FL-06	FL-07	FL-08	FL-09	FL-10						
Sample Date	04/07/2025	04/07/2025	04/07/2025	04/07/2025	04/07/2025	04/07/2025	04/07/2025	04/07/2025	04/07/2025	04/07/2025	04/07/2025	04/07/2025	04/07/2025						
Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N						
Sample Depth (ft)	4 ft	4 ft	4 ft	4 ft	4 ft	4 ft	4 ft	4 ft	4 ft	4 ft	4 ft	4 ft	4 ft						
Analyte	Units	Table 915-1 GSSL ^B	Table 915-1 RSSL ^B	Maximum Background Concentration	Maximum Background Concentration X 1.25														
SOIL SUITABILITY (Inorganics)																			
Boron	mg/L	2	2	0.417	0.52125	0.0955 J	0.0891 J	0.417	0.499	0.464	0.0829 J	0.0609 J	0.0716 J	0.254	1.07	0.0790 J	0.146 J	0.0611 J	
pH	SU	6-8.3	6-8.3	7.79	9.7375	7.58 T8	7.51 T8	7.79 T8	7.76 T8	7.65 T8	7.92 T8	7.42 T8	7.60 T8	7.57 T8	7.29 T8	7.78 T8	7.96 T8	8.26 T8	
SAR	NA	6	6	2.08	2.6	1.28	1.06	2.08	2.20	2.84	0.949	1.12	1.18	1.74	2.68	1.37	1.96	1.63	
EC	mmhos/cm	4	4	0.46	0.575	0.147	0.149	0.46	1.16	1.36	0.222	0.143	0.195	0.353	1.87	0.286	0.714	0.289	
METALS																			
Arsenic	mg/kg	0.29	0.68	1.17	1.4625	0.914 J	0.737 J	1.17	2.57	0.902 J	0.581 J	1.77	1.00	1.35	1.30	1.65	1.59	1.13	
Barium	mg/kg	82	15000	38.5	48.125	28.3	9.01	38.5	165	27.7	16.9	100	34.7	30.9	80.7	79.6	56.2	21.5	
Cadmium	mg/kg	0.38	71	ND	ND	< 1.00	< 1.00	< 1.00	0.219 J	< 1.00	< 1.00	0.0922 J	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	
Chromium (VI)	mg/kg	0.0067	0.3	0.672	0.84	< 1.00	< 1.00	0.672 J	0.463 J	< 1.00	< 1.00	0.996 J	< 1.00	0.843 J	< 1.00	0.723 J	0.572 J	< 1.00	
Copper	mg/kg	46	3100	3.7	4.625	2.54 J	0.996 J	3.70 J	19.3	2.35 J	0.963 J	10.0	3.85 J	2.84 J	7.16	4.60 J	3.20 J	1.78 J	
Lead	mg/kg	14	400	4.73	5.9125	2.90	1.59 J	4.73	15.3	3.30	1.71 J	7.73	3.54	3.19	5.73	6.05	4.62	3.70	
Nickel	mg/kg	26	1500	3.18	3.975	3.18	1.17 J	2.07 J	12.7	2.21 J	7.46	2.13 J	3.89	3.70	2.99	4.51	2.99	2.35 J	
Selenium	mg/kg	0.26	390	0.578	0.7225	0.571 J	0.207 J	0.578 J	1.45 J	0.487 J	0.360 J	1.32 J	0.697 J	0.805 J	1.37 J	0.921 J	0.824 J	0.942 J	
Silver	mg/kg	0.8	390	0.5	0.625	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	
Zinc	mg/kg	370	23000	13	16.25	13.0 J	6.03 J	10.8 J	80.3	10.6 J	4.89 J	39.5	17.3 J	11.5 J	22.7 J	25.6	15.0 J	10.2 J	
PID																			
PID (Photo-Ionization Detector)	ppm	NS	NS	24.1	30.125	24.1	8.7	NA	10.2	6.7	4.1	13.4	2.1	8	5.1	12.4	6.8	8.6	
TOTAL PETROLEUM HYDROCARBONS																			
TPH DRO	mg/kg	500	500	NA	NA	NA	NA	< 4.00	< 4.00	< 4.00	< 4.00	< 4.00	< 4.00	1.62 J	6.07	< 4.00	< 4.00	< 4.00	
TPH GRO	mg/kg	500	500	NA	NA	NA	NA	0.0263 B J	0.0348 B J	0.0227 B J	< 0.100	0.0233 J	0.0292 J	0.0226 J	0.0252 J	0.0253 J	0.0218 J	0.0218 J	
TPH ORO	mg/kg	500	500	NA	NA	NA	NA	< 4.00	2.00 J	< 4.00	0.724 J	2.66 J	3.11 J	22.6	0.775 J	0.998 J	0.707 J	0.707 J	
POLYCYCLIC AROMATIC HYDROCARBONS																			
1-Methyl-Naphthalene	mg/kg	0.006	18	NA	NA	NA	NA	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200
2-Methyl-Naphthalene	mg/kg	0.019	24	NA	NA	NA	NA	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200
Acenaphthene	mg/kg	0.55	360	NA	NA	NA	NA	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600
Anthracene	mg/kg	5.8	1800	NA	NA	NA	NA	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600
Benzo(a)anthracene	mg/kg	0.011	1.1	NA	NA	NA	NA	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600
Benzo(a)pyrene	mg/kg	0.24	0.11	NA	NA	NA	NA	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600
Benzo(b)fluoranthene	mg/kg	0.3	1.1	NA	NA	NA	NA	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600
Benzo(k)fluoranthene	mg/kg	2.9	11	NA	NA	NA	NA	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600
Chrysene	mg/kg	9	110	NA	NA	NA	NA	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600
Dibenzo(a,h)anthracene	mg/kg	0.096	0.11	NA	NA	NA	NA	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600
Fluoranthene	mg/kg	8.9	240	NA	NA	NA	NA	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600
Fluorene	mg/kg	0.54	240	NA	NA	NA	NA	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600
Indeno(1,2,3-cd)pyrene	mg/kg	0.98	1.1	NA	NA	NA	NA	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600
Pyrene	mg/kg	1.3	180	NA	NA	NA	NA	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600	< 0.00600
VOCs																			
Benzene	mg/kg	0.0026	1.2	NA	NA	NA	NA	< 0.00100	< 0.00100	< 0.00100	< 0.00100	< 0.00100	< 0.00100	< 0.00100	< 0.00100	< 0.00100	< 0.00100	< 0.00100	< 0.00100
Toluene	mg/kg	0.69	490	NA	NA	NA	NA	< 0.00500	0.00247 B J	0.00247 B J	0.00260 B J	0.00270 B J	0.00265 B J	0.00240 B J	0.00263 B J	0.00238 B J	0.00250 B J	0.00250 B J	
Ethyl-Benzene	mg/kg	0.78	5.8	NA	NA	NA	NA	< 0.00250	< 0.00250	< 0.00250	< 0.00250	< 0.00250	< 0.00250	< 0.00250	< 0.00250	< 0.00250	< 0.00250	< 0.00250	< 0.00250
Xylenes	mg/kg	9.9	58	NA	NA	NA	NA	< 0.00650	< 0.00650	< 0.00650	< 0.00650	< 0.00650	< 0.00650	< 0.00650	< 0.00650	< 0.00650	< 0.00650	< 0.00650	< 0.00650
1,2,4-Trimethyl-Benzene	mg/kg	0.0081	30	NA	NA	NA	NA	< 0.00500	< 0.00500	< 0.00500	< 0.00500	< 0.00500	< 0.00500	< 0.00500	< 0.00500	< 0.00500	< 0.00500	< 0.00500	< 0.00500
1,3,5-Trimethyl-Benzene	mg/kg	0.0087	27	NA	NA	NA	NA	< 0.00500	< 0.00500	< 0.00500	< 0.00500	< 0.00500	< 0.00500	< 0.00500	< 0.00500	< 0.00500	< 0.00500	< 0.00500	< 0.00500
Naphthalene	mg/kg	0.0038	2	NA	NA	NA	NA	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200

Notes:
N = Normal Environmental Sample

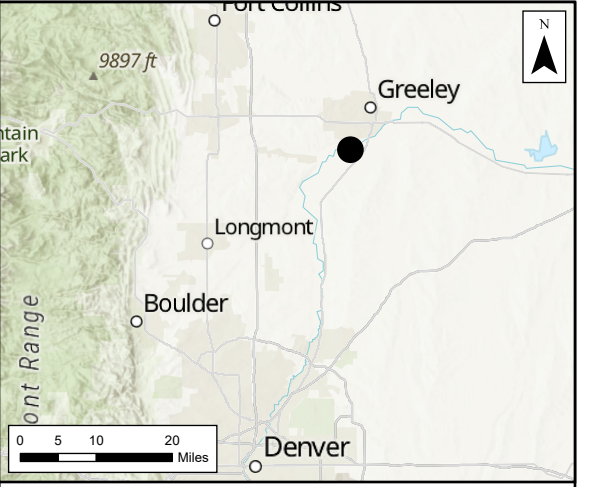
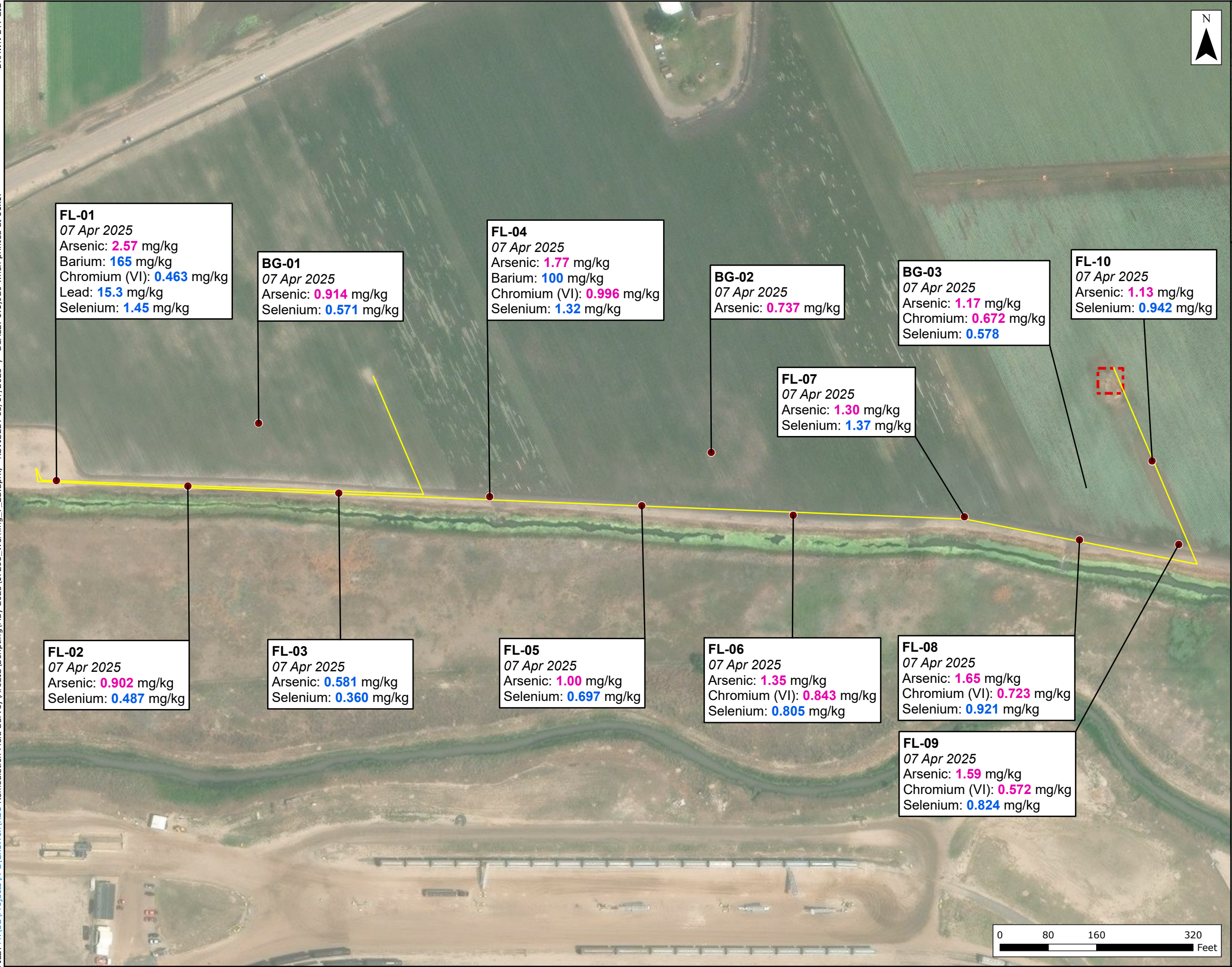
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
mmhos/cm = milliohms (mmhos) per centimeter
ppm = parts per million
SU = standard units

Table 915-1 RSSL^B = ECMC Table 915-1 Limits Residential Soil Screening Level
Table 915-1 GSSL^B = ECMC Table 915-1 Protection of Groundwater Soil Screening Level
NA = Not Applicable
NS = no standard

< = Compound not detected at concentrations above the laboratory reporting detection limit. The laboratory reporting detection limit is shown.
Pink & blue highlighted soil analytical values indicate an exceedance of the referenced soil screening level (SSL)
* Indicates laboratory minimum detection limit in excess of SSL
ECMC - Colorado Energy & Carbon Management Commission
ft. = feet

Qualifier Definition(s)

Analysis performed by PACE
B J = Compound was found in the blank and sample; Estimated value
J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value
T8 = Sample(s) received past/too close to holding time expiration.



Legend

- Soil Sample Locations
- Approximate Flowline
- ⊠ Former Wellhead

Notes:
 Results in milligrams per kilogram (mg/kg) unless otherwise noted.
Pink values exceed ECMC table 915-1 Limits (Residential SSL).
Blue values exceed ECMC table 915-1 Limits (Protection of Groundwater SSL).
 Former sample location exceedances are grey.

Analytical results below laboratory detection limits or within compliance of ECMC Table 915-1 not shown.

ECMC Table 915-1 GSSLs Listed in mg/kg
 Arsenic = 0.29
 Barium = 82
 Chromium = 0.00067
 Lead = 14
 Selenium = 0.26

ECMC = Energy and Carbon Management Commission
 ft bgs = feet below ground surface
 PID = Photoionization Detector
 ppm = parts per million
 GSSL = Groundwater Soil Screening Levels
 RSSL = Residential Soil Screening Levels

Figure 1
Exceedance Values
in Soil Samples
Werning 7 2B
REM# 17203
Operator: 100322
 RBURemediationFieldSurvey
 Chevron
 Weld County, CO

