

# SITE-SPECIFIC QUALITY ASSURANCE & QUALITY CONTROL AUDIT



Permit Closure Type – Final

## PERMIT CLOSURE REPORT – RANGELAND

Location ID 319214

Location Name Champlin 1-9 Pad

### Report Date

5 Sep 2023

Soil Sage has conducted a thorough data audit as part of our Quality Assurance and Quality Control (QA/QC) protocols. The audit revealed this site has gone through a land use change.

### Initial Job Assignment

Client	CIVITAS Resources
Work Assignment	Civitas Monitoring
Date	6 Dec 2022

### Quality Assurance & Quality Control Audit

Auditor	Soil Sage
Audit Date	11 Jul 2023

### Audit Methodology

The following source materials were consulted during the QA and QC audit process:

- ✓ Site Permit Closures provided by CIVITAS Resources
- ✓ Colorado Oil & Gas Information System – COGIS Database
- ✓ On-site Evaluation and Proprietary Soil Sage Drone Imagery data collection
- ✓ Review of legacy imagery for site location and facility parameters

All pertinent data, imagery, and materials are included at the end of this report.

## Site Description

<b>Name</b>	Champlin 1-9 Pad		
<b>Location ID</b>	<a href="#">319214</a>		
<b>Operator / #</b>	BONANZA CREEK ENERGY OPERATING COMPANY LLC / 8960		
<b>Field</b>	WATTENBERG / 90750		
<b>County, State</b>	WELD, CO		
<b>Lat/Long</b>	40.321220 / -104.436140		
	Planned Location	X	As Drilled
<b>Facility Status</b>	AC	<b>Location</b>	SESE 9 4N63W
<b>Facility Status Date</b>	06/17/2019	<b>Access Road</b>	Oil & Gas Access
<b>Facility Entities</b>	X	Tank Battery	Pits
	X	Wells	X Off-Location Flowlines ( <b>Form 44</b> )
		Domestic Taps	X On-Location Flowlines ( <b>Form 42</b> )
<b>Equipment Remaining on Site</b>	X	None	Debris or Non-Oil & Gas
		List of Equipment:	
<b>Environment Incidents &amp; Remediation</b>		None	Spill or Release ( <b>Form 19</b> )
	X	Remediation ( <b>Form 27/27A</b> )	
<b>Inspection Corrective Actions (CA)s</b>	<p><b>Corrective Actions (CA)s were detected during the QA &amp; QC Audit.</b>  <b>CA Overall Status:</b> 1 of 1 Completed; <b>Pending re-inspection.</b>  <b>CA-Approving Inspection Doc # &amp; Date:</b></p> <ul style="list-style-type: none"> <li>○ <b>Inspector:</b></li> </ul> <p><b>Form FIRR Doc # &amp; Submittal Date:</b> <a href="#">401860327</a> &amp; 12/07/2018</p> <ul style="list-style-type: none"> <li>○ <b>Overall Status:</b> None Stated</li> <li>○ <b>Originating Field Inspection Report (FIR) Doc #:</b> <a href="#">690002770</a></li> <li>○ <b>CA#:</b> 120552 <b>Date Completed:</b> 11/21/2018</li> </ul> <p>The cited flowline has been locked out and tagged in order to comply with Rule 603f. The flowline has also been scheduled for abandonment. An eForm 42 will be submitted upon completion.  <b>ECMC Decision:</b> Approved pending re-inspection.</p>		
	<p><b>Complete ECMC Inspection Search Results:</b> <a href="#">Link</a></p>		
<b>Sundry Notice (Form 4)</b>	<p><b>Form 4 Doc # &amp; Date:</b> <a href="#">401103096</a> &amp; 10/05/2016</p> <ul style="list-style-type: none"> <li>○ <b>Purpose:</b> Change of Well, Facility or Oil &amp; Gas Location Name or Number</li> </ul> <p><b>From:</b> CHAMPLIN-64N63W 9SESE</p>		

	<p><b>To:</b> Champlin 1-9 Pad</p>
	<p><b>Form 4s were detected during the QA &amp; QC Audit.</b> See individual scout card data for details.</p>
<p><b>On Location Flowlines (Form 42)</b></p>	<p><b>Form 42 Doc # &amp; Date:</b> <a href="#">401949338</a> &amp; 02/25/2019</p> <ul style="list-style-type: none"> <li>○ <b>Purpose:</b> Flowlines abandoned – per RULE 1105</li> <li>○ <b>Date Completed:</b> 12/07/2018</li> </ul> <p><b>Form 42s were detected during the QA &amp; QC Audit.</b> See individual scout card data for details.</p>
<p><b>Off-Location Flowlines (Form 44)</b></p>	<p><b>Form 44 Doc # &amp; Date:</b> <a href="#">402076875</a> &amp; 06/17/2019</p> <ul style="list-style-type: none"> <li>○ <b>Purpose:</b> Abandonment</li> <li>○ <b>Abandonment Date:</b> 06/12/2019</li> <li>○ <b>ECMC Approval Date &amp; Signee:</b> 06/17/2019 by Jeff Robbins</li> <li>○ <b>Operator Comments:</b> None</li> </ul> <p><b>Flowline Facility Information</b></p> <ul style="list-style-type: none"> <li>○ <b>ECMC Flowline ID:</b> <a href="#">463240</a></li> <li>○ <b>Operator Flowline ID:</b> Guttersen Ranch 43-9 Flowline</li> <li>○ <b>Status &amp; Date:</b> AC &amp; 06/17/2019</li> <li>○ <b>Flowline Type:</b> Wellhead Line</li> <li>○ <b>Type of Fluids Transported:</b> Multiphase</li> <li>○ <b>Start Point Location ID:</b> <a href="#">309967</a></li> <li>○ <b>Start Point Riser Lat/Long:</b> 40.324656 / -104.436142 (Guttersen Ranch #43-9 Well)</li> <li>○ <b>Equipment at Start Point:</b> Well</li> <li>○ <b>End Point Location ID:</b> <a href="#">319214</a></li> <li>○ <b>End Point Riser Lat/Long:</b> 40.321059 / -104.436510 (CHAMPLIN-64N63W /9SESE Production Facilities)</li> <li>○ <b>Equipment at End Point Riser:</b> Separator</li> </ul> <p><b>Flowline Facility Information</b></p> <ul style="list-style-type: none"> <li>○ <b>ECMC Flowline ID:</b> <a href="#">463242</a></li> <li>○ <b>Operator Flowline ID:</b> Guttersen Ranch 9I Flowline</li> <li>○ <b>Status &amp; Date:</b> AC &amp; 06/17/2019</li> <li>○ <b>Flowline Type:</b> Wellhead Line</li> <li>○ <b>Type of Fluids Transported:</b> Multiphase</li> </ul>

- **Start Point Location ID:** [419302](#)
- **Start Point Riser Lat/Long:** 40.323021 / -104.438523 (GUTTERSEN RANCH #9I Well)
- **Equipment at Start Point:** Well
- **End Point Location ID:** [319214](#)
- **End Point Riser Lat/Long:** 40.321059 / -104.436510 (CHAMPLIN-64N63W /9SESE Production Facilities)
- **Equipment at End Point Riser:** Separator

**Flowline Facility Information**

- **ECMC Flowline ID:** [463241](#)
- **Operator Flowline ID:** Gutteresen Ranch 34-9 Flowline
- **Status & Date:** AC & 06/17/2019
- **Flowline Type:** Wellhead Line
- **Type of Fluids Transported:** Multiphase
- **Start Point Location ID:** [309968](#)
- **Start Point Riser Lat/Long:** 40.321592 / -104.441356 (GUTTERSEN RANCH #34-9 Well)
- **Equipment at Start Point:** Well
- **End Point Location ID:** [319214](#)
- **End Point Riser Lat/Long:** 40.321059 / -104.436510 (CHAMPLIN-64N63W /9SESE Production Facilities)
- **Equipment at End Point Riser:** Separator

**Flowline Facility Information**

- **ECMC Flowline ID:** [463243](#)
- **Operator Flowline ID:** Gutteresen Ranch 33-9 Flowline
- **Status & Date:** AC & 06/17/2019
- **Flowline Type:** Wellhead Line
- **Type of Fluids Transported:** Multiphase
- **Start Point Location ID:** [309966](#)
- **Start Point Riser Lat/Long:** 40.325306 / -104.440946 (GUTTERSEN RANCH #33-9 Well)
- **Equipment at Start Point:** Well
- **End Point Location ID:** [319214](#)

	<ul style="list-style-type: none"> <li>○ <b>End Point Riser Lat/Long:</b> 40.321059 / -104.436510 (CHAMPLIN-64N63W /9SESE Production Facilities)</li> <li>○ <b>Equipment at End Point Riser:</b> Separator</li> </ul>
<b>Site Investigation and Remediation Workplan (Form 27/27A)</b>	<p><b>Remediation Project #:</b> <a href="#">14402</a></p> <p><b>Form 27A Supplemental Docs # &amp; Date:</b> <a href="#">402328951</a> &amp; 03/02/2020</p> <ul style="list-style-type: none"> <li>○ <b>Purpose:</b> Pit of PW vessel closure</li> <li>○ <b>No Further Action Request Approved:</b> 03/02/2020 by Bob Chesson</li> <li>○ <b>Final Resolution:</b> Case Resolved on 03/02/2020</li> </ul> <p><b>Form 27 Initial Doc# &amp; Date:</b> <a href="#">402209599</a> &amp; 10/15/2019</p> <ul style="list-style-type: none"> <li>○ <b>Purpose:</b> Pit of PW vessel closure</li> <li>○ <b>Operator Comments:</b> None</li> </ul>
<b>Field Inspection Form (Form INSP)</b>	<p><b>Form INSP Doc # &amp; Date:</b> <a href="#">690002770</a> &amp; 11/27/2018</p> <ul style="list-style-type: none"> <li>○ <b>Status Summary:</b> Follow Up Inspection Required, No Follow Up Inspection Required, Corrective Action Response Requested</li> <li>○ <b>Inspected Facilities:</b> Champlin 1 Well</li> <li>○ <b>Inspection Status:</b> PA</li> <li>○ <b>Inspection Date &amp; Inspector:</b> 11/20/2018 by Craig Carlile</li> <li>○ <b>Comments:</b> Equipment/Riser remains at wellhead after plugging operations.</li> <li>○ <b>Corrective Action:</b> Flowline risers not LO/TO or marked are considered unused equipment. Comply with Rule 603.f. <b>Corrective Action Date:</b> 12/20/2018</li> <li>○ <b>Attachments:</b> Inspection Photos Doc #<a href="#">690002771</a></li> </ul>
<b>COGIS Tank Facilities Information (Scout Card)</b>	<p><b>No Tank Battery documents were detected during this QA/QC Audit.</b> However, this location is referred to as the CHAMPLIN-64N63W/9SESE Production Facilities at the End Point Risers of the four Off-Location Flowlines listed above in Form 44 Document #<a href="#">402076875</a> from 06/17/2019.</p>
<b>COGIS Well Information (Scout Card)</b>	<p><b>Well Name:</b> Champlin #1</p> <p><b>API#:</b> <a href="#">05-123-10877</a></p> <p><b>FACILITY ID:</b> 243086</p> <ul style="list-style-type: none"> <li>○ <b>Status &amp; Date:</b> PA &amp; 10/06/2018</li> <li>○ <b>Lat/Long As Drilled:</b> 40.321220 / -104.436140</li> <li>○ <b>Form 42:</b> There are ten total Form 42s Offset Mitigation Completed for this well. <a href="#">Link</a> to Well Documents.</li> </ul>

	<ul style="list-style-type: none"> <li>○ <b>Form 6 Doc # &amp; Date:</b> <a href="#">401812200</a> &amp; 03/19/2019 <b>Comments:</b> Bonanza Creek is in the process of abandoning flowlines per rule 1105, but the work has not yet been completed at the time of the Form 6 SR submittal. A Form 42 will be submitted when the flowlines have been fully abandoned.</li> <li>○ <b>Form 4 Doc # &amp; Date:</b> <a href="#">401946611</a> &amp; 03/04/2019 <b>Purpose:</b> Digital Well Log Upload</li> <li>○ <b>Form 42 Doc # &amp; Date:</b> <a href="#">401810722</a> &amp; 10/26/2018 <b>Purpose:</b> Completion of Form 2/2A Permit Condition. COA for Confluence DJ (Operator #10518) 70 Ranch well permits from 70 Ranch 10 West pad: Option 2, adequately P&amp;A well to isolate all formations.</li> <li>○ <b>Form 42 Doc # &amp; Date:</b> <a href="#">401780759</a> &amp; 10/02/2018 <b>Purpose:</b> Start of Plugging Operations – 48-hour notice required</li> </ul>
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ECMC Abbreviations: [Location & Facility Status Codes](#), [Inspection Types & Statuses](#) and [ECMC Help](#).

## Audit Key Findings – Designation Land Use Observations

PREVIOUS LAND USE	CURRENT LAND USE
<b>Reference Imagery for Infrastructure:</b> USDA NAIP 2017	<b>Remotely Sensed Imagery:</b> 28 Jun 2023
<b>Designation:</b> Oil & Gas Facility	<b>Designation:</b> Rangeland

### The following imagery sources were reviewed during this audit:

EarthExplorer, DRCOG 2002 - 2014, NAIP Imagery 2011, 2013, 2015, 2017, 2019, 2021, ESRI Maxar and Remotely Sensed Imagery Sep 2022

## Closure Information

Champlin 1-9 Pad [319214](#), shares an off-location flowline with Guttersen Ranch 43-9 Pad [309967](#).

Open CA#: 120552 requires closure during final inspection of this site.

# ATTACHMENTS

## Documents

Recommendations

## Maps and Figures

### *Area Maps*

Previous Infrastructure Overview

Current Site Overview

NAIP NDVI Composite

Elevation & Contours

Slope

Hydrology

NDVI

NDRE

## Background Information

*Natural Resources Conservation Service (NRCS) Map Unit Description*

Reference Soil Document

## Recommendations

### Monitoring Change Over Time

Location ID – 319214 Champlin 1

Date of Sampling – 28 JUNE 2023

### Vegetation Ecological Analysis

Observation Point	Bare Ground	Grass	Forbs	Shrubs	Litter	Weeds	Field Notes
Recovery	10	30	0	0	60	0	Wheat *
Road	28	10	2	0	20	40	Blue grama, sisymbrium spp. Cheatgrass, Russian Thistle. Others Rocky Mountain Bee plant and winter fat
Reference	10	5	10	20	15	40	Winter fat and sisymbrium spp. Russian Thistle and high infestation of Cheatgrass

\*Indication of Russian Thistle, tansy mustard and cheatgrass – pressure from outside the reclaim area

### Vegetation Indices

Vegetation Indices NDVI and NDRE are provided as reference information. The disturbance extent and reference extents that fall within the same soil types. Typical land use was observed in this area with similar vegetation properties.

#### **Recommendation**

Due to the presence of weeds in the reference extent that exceeds the percentage of observed weeds in the reclaim extent, continuous impact to the reclaim extent is likely. Control of cheatgrass and Russian thistle will be unsuccessful.

#### **Reference Extent Vegetation Observations**

Percent cover is determined using random sampling methods within the vegetation extent and using a sampling hoop of 0.5 sq meters in size.

#### **Native or Endemic in the surrounding area**

Common Name	Scientific Name	Percentage
Winter Fat	<i>Krascheninnikovia lanata</i>	20
Mustard (Could be tansy mustard)	<i>Sisymbrium spp.</i>	10
Grasses	<i>Genus poaceae</i>	5

## Soil Sage

### *Invasive*

Common Name	Scientific Name	Percentage
Cheatgrass	<i>Bromus tectorum</i>	30
Russian Thistle	<i>Salsola tragus</i>	10

### *Recovery Extent Vegetation Observations*

#### *Native or Endemic*

Common Name	Scientific Name	Percentage
Wheat	<i>Triticum spp.</i>	30

### *Invasive*

Common Name	Scientific Name	Percentage
Russian Thistle	<i>Salsola tragus</i>	-
Cheatgrass	<i>Bromus tectorum</i>	-

These species are in the area – litter indicates last year's Russian Thistle debris

### *Road Extent Vegetation Observations*

#### *Native or Endemic*

Common Name	Scientific Name	Percentage
Blue grama	<i>Bouteloua gracilis</i>	10
Mustard	<i>Sisymbrium spp</i>	2
Rocky Mountain Bee Plant	<i>Cleome serrulata</i>	<1
Winter Fat	<i>Krascheninnikovia lanata</i>	<1

### *Invasive*

Common Name	Scientific Name	Percentage
Russian Thistle	<i>Salsola tragus</i>	20
Cheatgrass	<i>Bromus tectorum</i>	20

### *Weed Summary Reference*

Common Name	Weed List Type	Percent Cover (%)
Cheatgrass	Colorado List C Noxious Weed	30
Russian Thistle	Common Weed	10

### *Weed Summary Recovery*

Common Name	Weed List Type	Percent Cover (%)
Cheatgrass	Colorado List C Noxious Weed	1
Russian Thistle	Common Weed	1

### ***Weed Inventory Criteria***

- Each site is assessed for noxious weeds and common weeds.
- Data are aggregated using point locations coupled with percent cover assessments and area measurements as needed.
- Governance - Colorado Department of Agriculture - Colorado Noxious Weeds List, effective October 2020
- List A - Designated for eradication, List B - Designed to stop the continued spread, List C - Facilitate more integrated effective weed management, Watch List - Determined to pose a potential threat to agriculture and natural productivity.
- Common - designates weeds that do not fall within the Colorado Department of Agriculture lists.
- Other - designates other identified weeds at the site.

### ***Weed Pressure***

Current weed pressure in reclaim extent is lower than the reference extent.

## **Hydrology**

Hydrology – Stream Orders 1 – 5 are present - dominant streams are orders are 1, 2 and 3. Order 3-5 are present in locations that have the potential for soil erosion represented by gullying and riling that follow the elevation gradient from high to low within the current reclaim extent. These could be major runoff areas for gullying and soil erosion with heavy precipitation events. The soil texture in the area is primarily sand.

Ponding - potential ponding can occur where water follows the elevation gradients in low lying areas primarily – this site is not impacted by ponding.

## **Soil/Erosion**

Exposed soils have low susceptibility to water erosion and in the high susceptible group for wind erosion due to ecosystem dynamics and vegetative cover.

## **Site Recommendation and Re-Evaluation**

The ecological evaluation of the site indicates a high concentration of weeds, Cheatgrass and Russian thistle in the reference area. The recovery target rate for the disturbance and road extents have been met. Target recovery rate 25% - reclaim and road at the time of sampling reflect 44%.

Recommend for this site for closure.

## Seed Mix

### Vegetation Seed Mix

No Additional reclamation procedures are recommended at this time.

#### Deep Sand Ecosystem

	Common Name	Scientific Name	#PLS/Acre	% of Mix
	Needle and Thread	<i>Hesperostipa comata</i>	2	8
	Sand Bluestem	<i>Andropogon hallii</i>	3	13
<b>Grasses</b>	Prairie Sandreed	<i>Calamovilfa longifolia</i>	4	17
	Blue Grama	<i>Bouteloua gracilis</i>	2	8
	Western Wheatgrass	<i>Pascopyrum smithii</i>	0.2	1
	Switchgrass	<i>Panicum virgatum L.</i>	5	21
	Sideoats Grama	<i>Bouteloua curtipendula</i>	2	8
	Purple Prairie Clover	<i>Dalea purpurea</i>	0.2	1
<b>Forbs/Legumes</b>	Scarlet Globemallow	<i>Sphaeralcea coccinea</i>	0.1	0
	Buckwheat	<i>Eriogonum spp.</i>	5	21
	Fourwing Saltbrush	<i>Atriplex canescens</i>	0.5	2
<b>Total</b>	<b>Total</b>		<b>24</b>	<b>100</b>

**NOTE:** The above seed mix is based on the soil type and landscape position. The surrounding area has similar soil properties, and this seed mix is subject to change based on land use type.

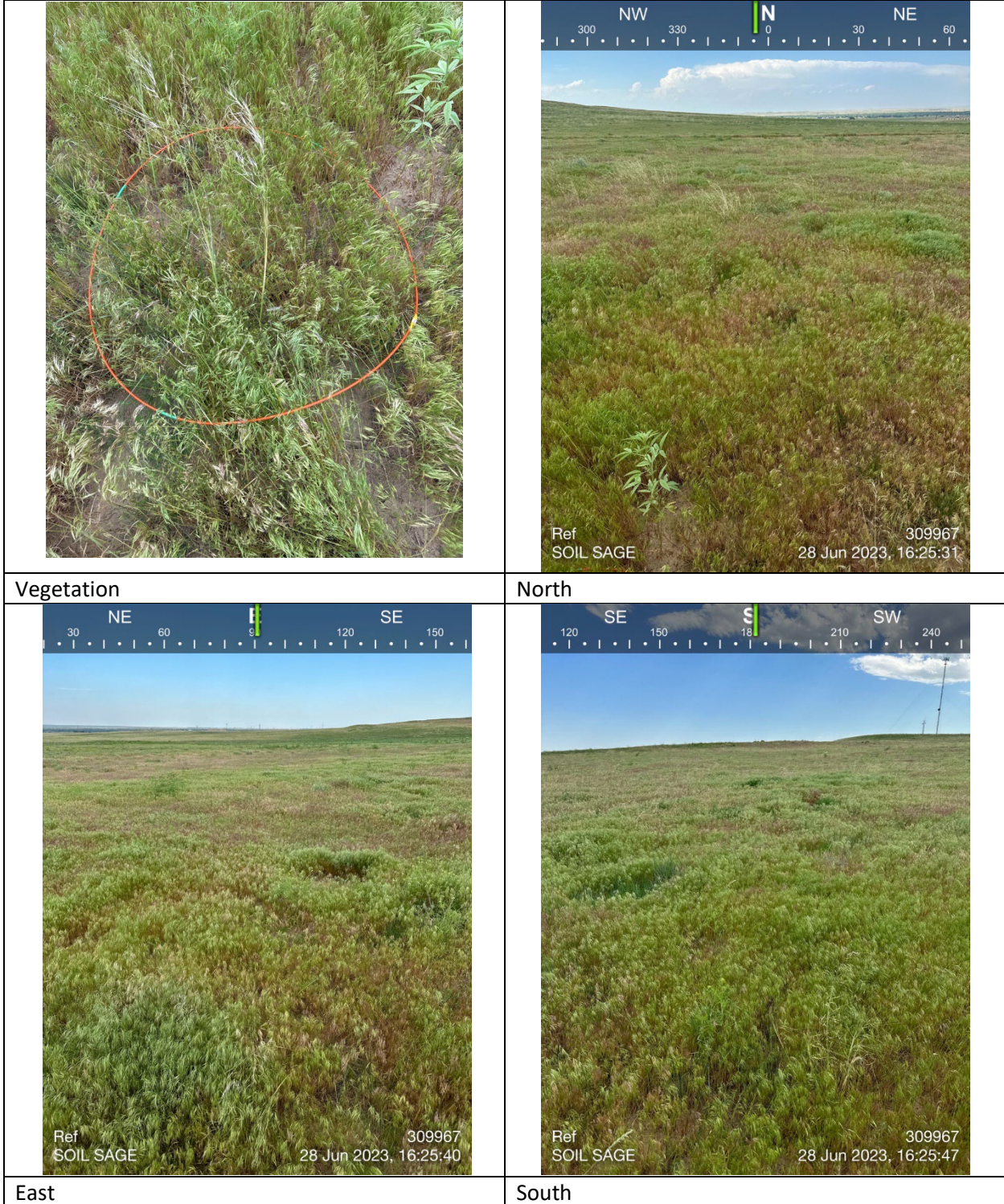
## Reclaim Area Protocol

Time Frame	Activity	Specifications	Site Totals
June 2023	Monitoring	Weeds present	
September 2023	Veg cover met. Recommend for Closure	Weed pressure high in reference that will continue to impact the reclaim site.	

# Site Photos

## Reference

40.324421 / -104.436544



Soil Sage



Native or Endemic



Invasive



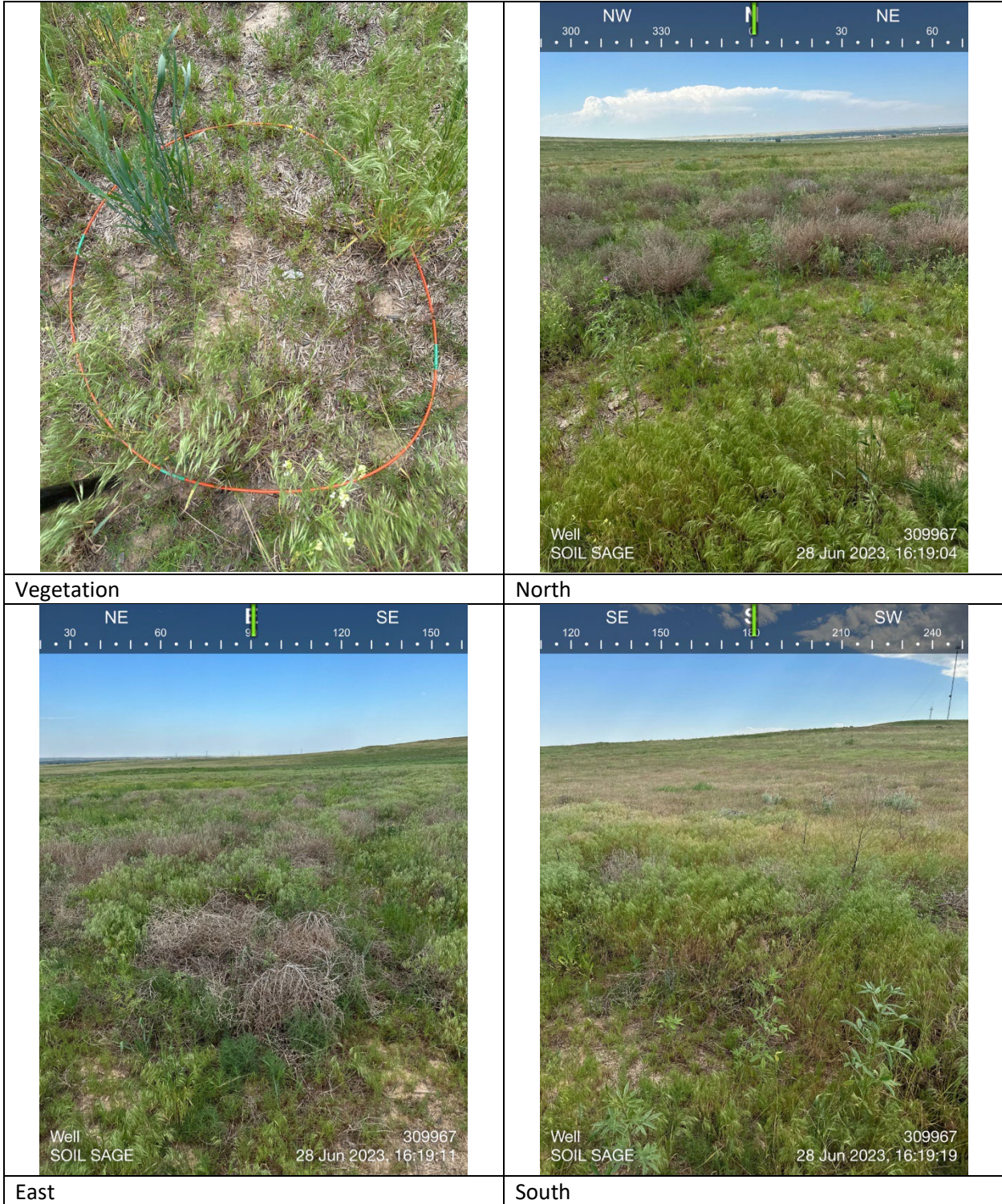
Cheatgrass – *Bromus tectorum* – Colorado List C  
Noxious Weed



Russian Thistle – *Salsola tragus* – Common Weed

Recovery

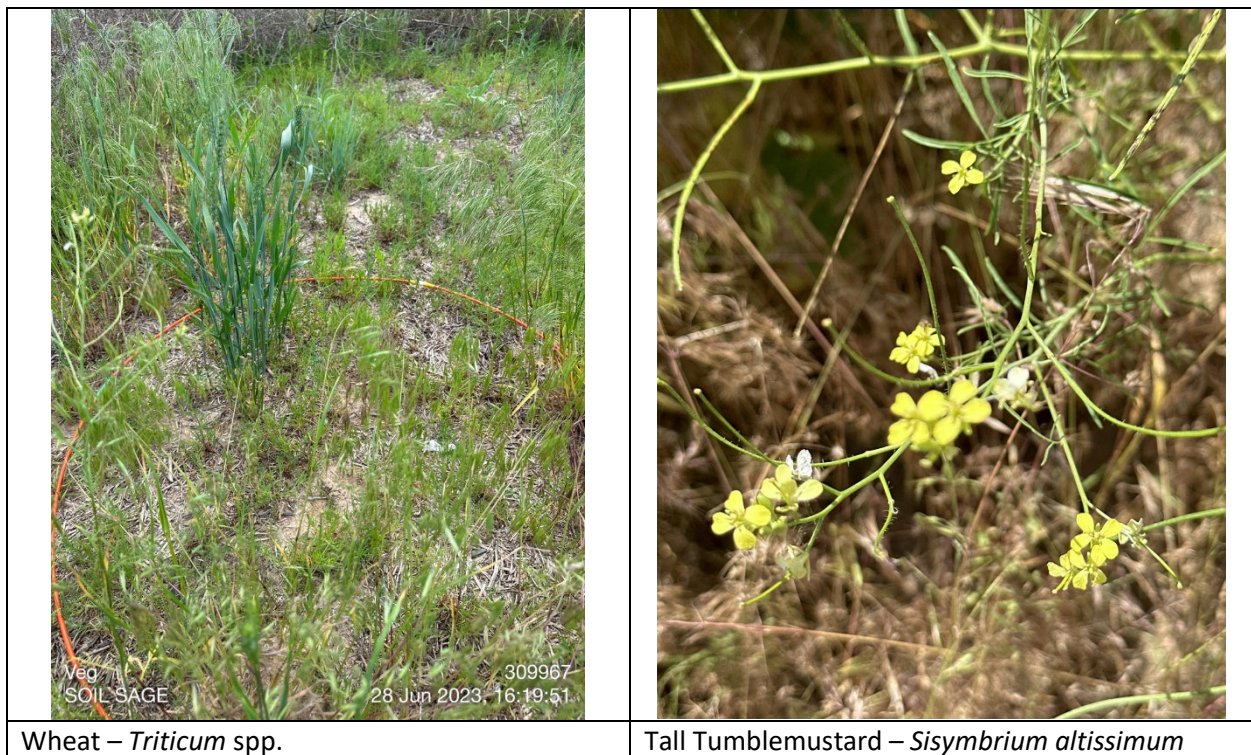
40.32463 / -104.436144



Soil Sage



Native or Endemic



Invasive



Cheatgrass – *Bromus tectorum* – Colorado List C  
Noxious Weed



Russian Thistle – *Salsola tragus* – Common Weed

## Site Overview Photos

Date – 28 June 2023

Cardinal Direction – in order from NESW



North



East

Soil Sage



South



West

## Site Overview Photos

Date – 24 Aug 2022

Cardinal Direction – in order from NESW



North



East

Soil Sage



South

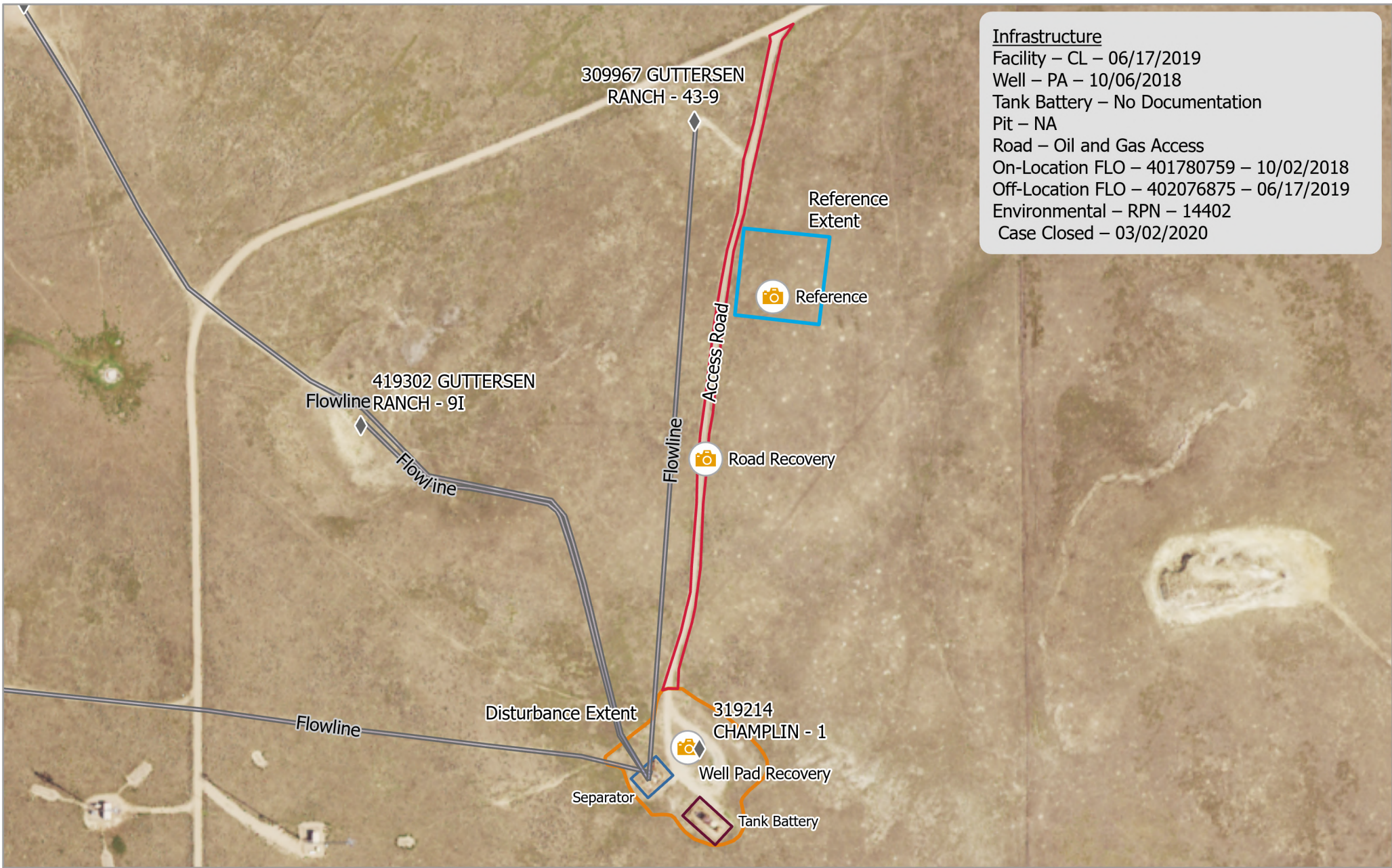


West

Soil Sage



Overhead



**Infrastructure**  
 Facility – CL – 06/17/2019  
 Well – PA – 10/06/2018  
 Tank Battery – No Documentation  
 Pit – NA  
 Road – Oil and Gas Access  
 On-Location FLO – 401780759 – 10/02/2018  
 Off-Location FLO – 402076875 – 06/17/2019  
 Environmental – RPN – 14402  
 Case Closed – 03/02/2020

**CIV - 319214- Champlin 1  
 Map Extent - USDA NAIP 2017**

Imagery: USDA NAIP  
 Imagery Date: 2017  
 Map Date: 25 Jul 2023  
 Datum: WGS 1984 UTM Zone 13N  
 POC: Soil Sage

**Legend**

◆ Wells	▭ Disturbance Extent
📷 Observation Points	▭ Reference Extent
▭ Flowline (assumed)	▭ Separator
▭ Access Road Extent	▭ Tank Battery

0 90 180 Meters

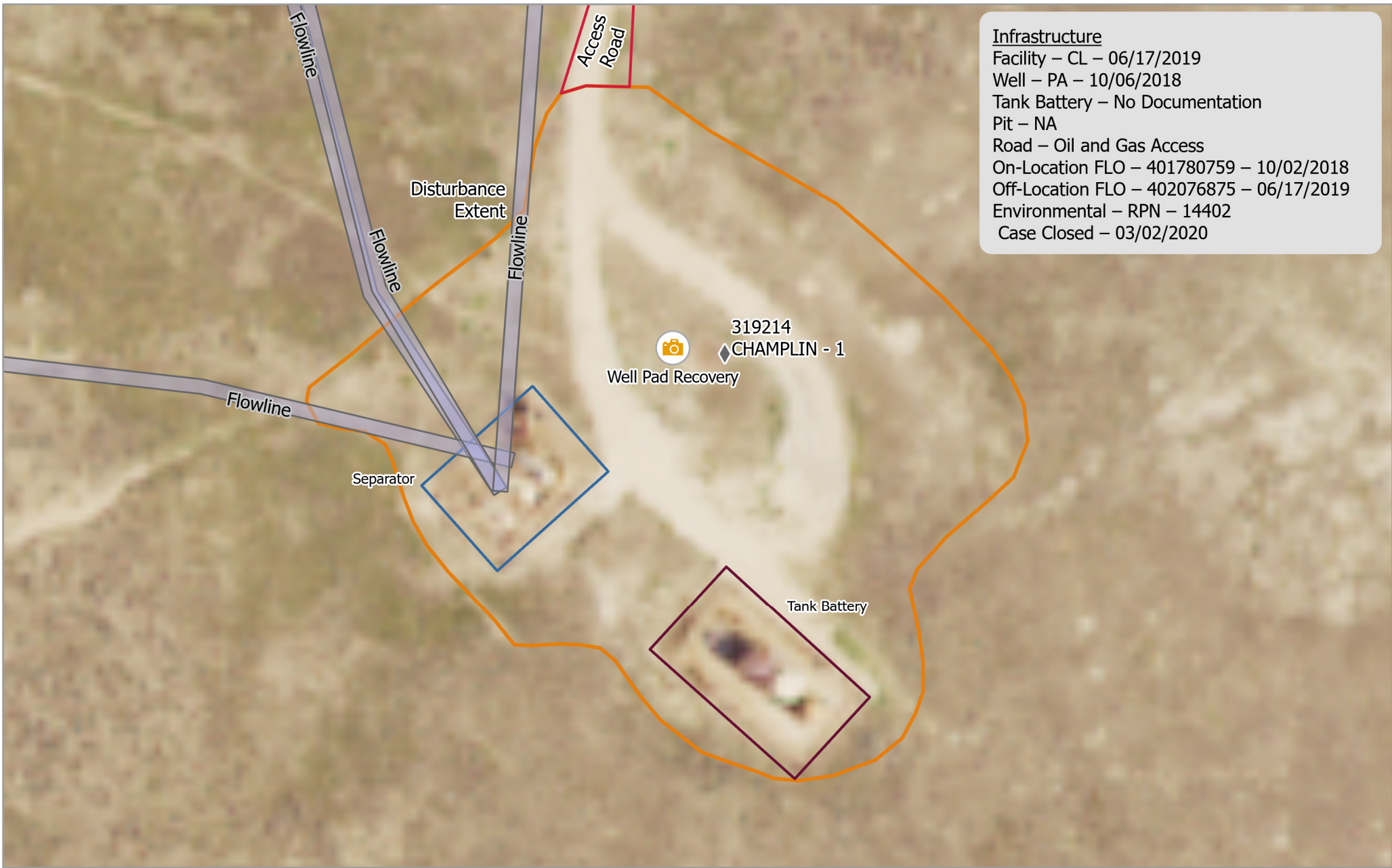
Scale: 1:3,100

Pad Location:  
 40.324640  
 -104.436140

N



Service Credits - Maxar, Microsoft



**Infrastructure**  
 Facility – CL – 06/17/2019  
 Well – PA – 10/06/2018  
 Tank Battery – No Documentation  
 Pit – NA  
 Road – Oil and Gas Access  
 On-Location FLO – 401780759 – 10/02/2018  
 Off-Location FLO – 402076875 – 06/17/2019  
 Environmental – RPN – 14402  
 Case Closed – 03/02/2020

**CIV - 319214- Champlin 1**  
**Map Extent - USDA NAIP 2017**  
**Large Scale**  
 Imagery: USDA NAIP  
 Imagery Date: 2017  
 Map Date: 25 Jul 2023  
 Datum: WGS 1984 UTM Zone 13N  
 POC: Soil Sage

**Legend**

◆ Wells	▭ Tank Battery
📷 Observation Points	▭ Separator
▭ Flowline (assumed)	▭ Access Road Extent
	▭ Disturbance Extent

0 20 40 Meters

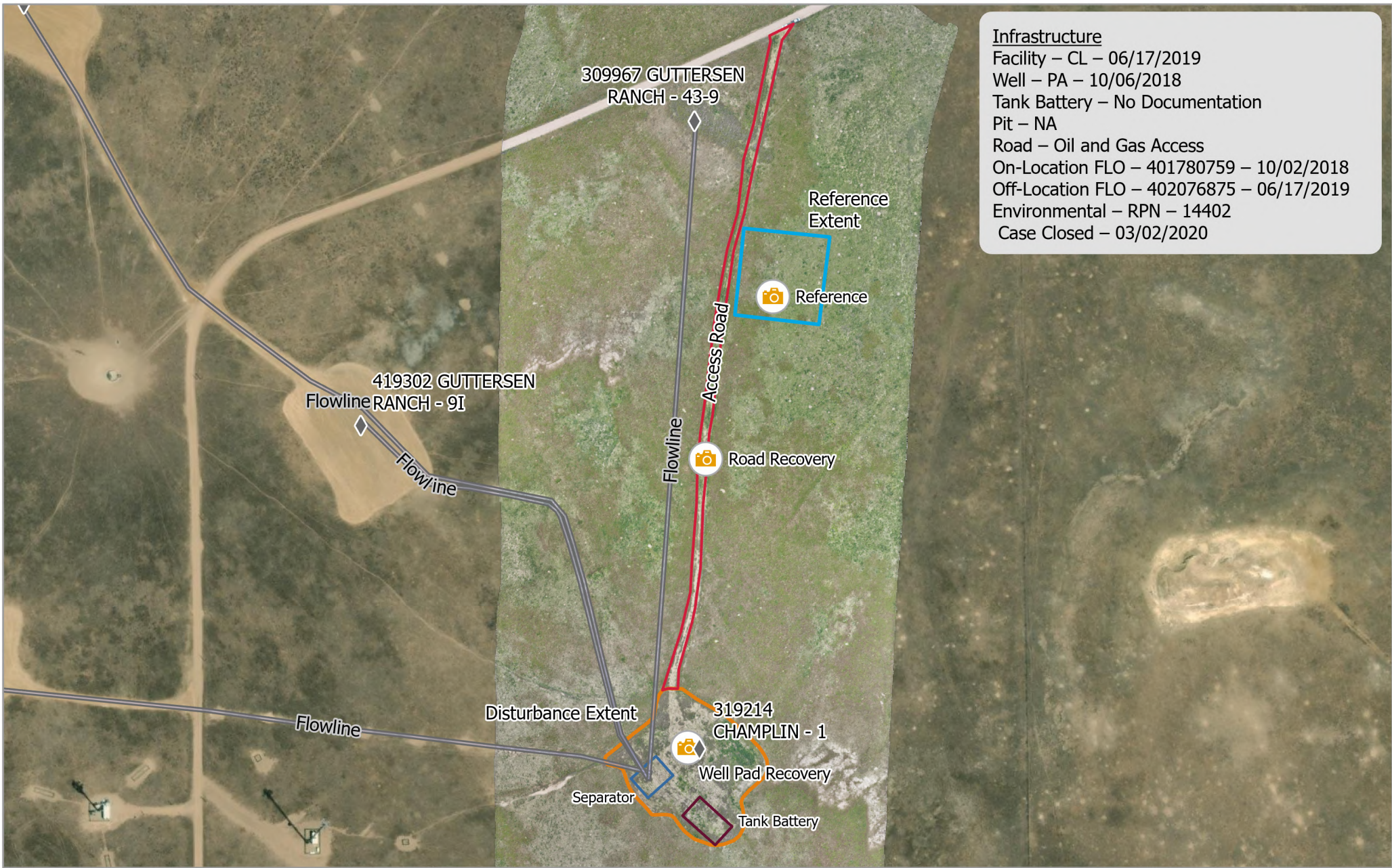
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 -104.436140

N



Service Credits - Maxar, Microsoft



**Infrastructure**  
 Facility – CL – 06/17/2019  
 Well – PA – 10/06/2018  
 Tank Battery – No Documentation  
 Pit – NA  
 Road – Oil and Gas Access  
 On-Location FLO – 401780759 – 10/02/2018  
 Off-Location FLO – 402076875 – 06/17/2019  
 Environmental – RPN – 14402  
 Case Closed – 03/02/2020

**CIV - 319214- Champlin 1  
 Map Extent - Overview**

Imagery: RS Orthomosaic & DSM, Maxar  
 Imagery Date: 28 Jun 2023, 1 Aug 2020  
 Map Date: 25 Jul 2023  
 Datum: WGS 1984 UTM Zone 13N  
 POC: Soil Sage

**Legend**

- ◆ Wells
- 📷 Observation Points
- ▬ Flowline (assumed)
- ▭ Separator
- ▭ Tank Battery
- ▭ Access Road Extent
- ▭ Disturbance Extent
- ▭ Reference Extent

0 90 180 Meters

Total Disturbance:  
1.89 Acres

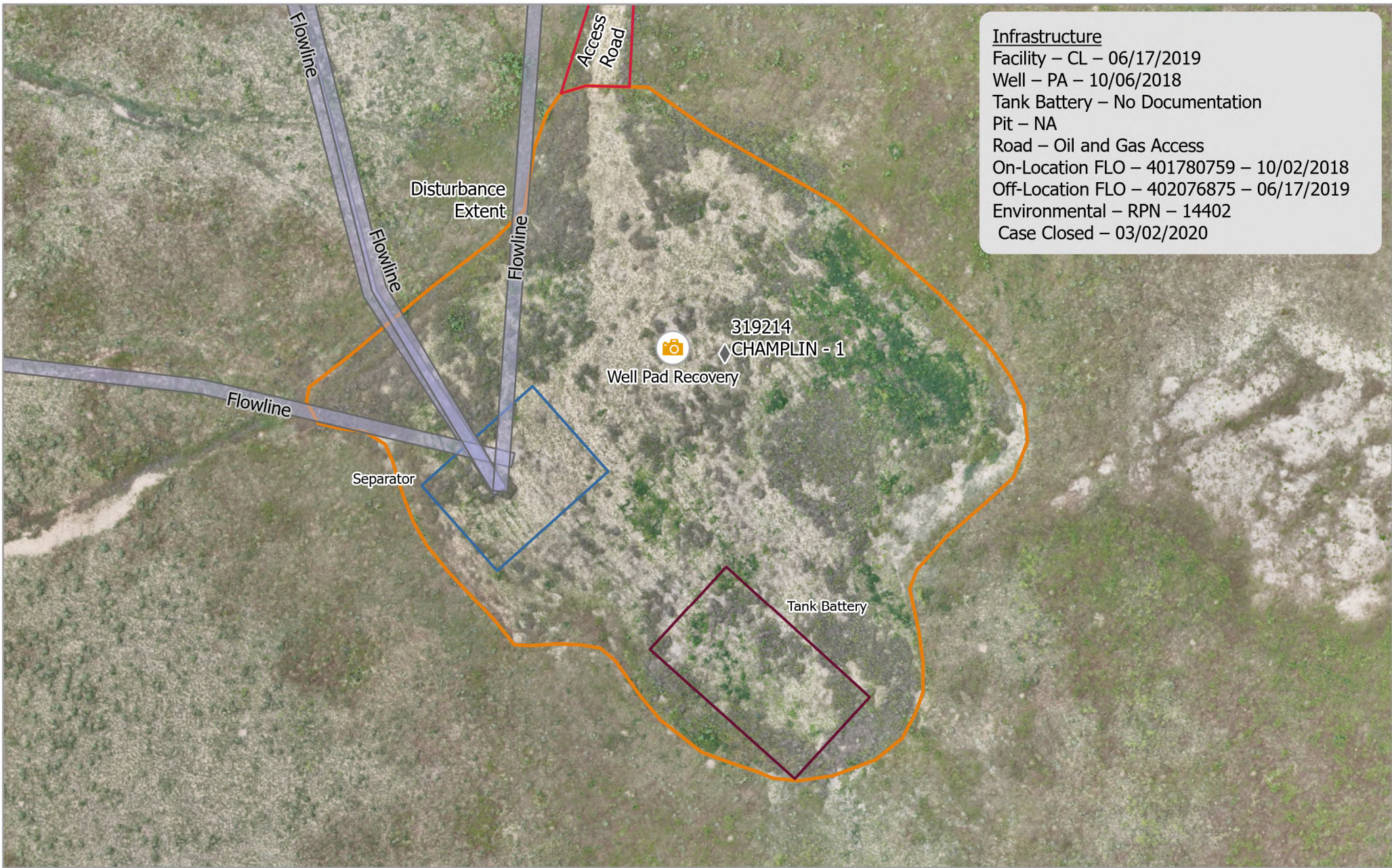
Pad Location:  
40.324640  
-104.436140

Scale: 1:3,100

N



Service Credits - Maxar, Microsoft



**Infrastructure**  
 Facility – CL – 06/17/2019  
 Well – PA – 10/06/2018  
 Tank Battery – No Documentation  
 Pit – NA  
 Road – Oil and Gas Access  
 On-Location FLO – 401780759 – 10/02/2018  
 Off-Location FLO – 402076875 – 06/17/2019  
 Environmental – RPN – 14402  
 Case Closed – 03/02/2020

**CIV - 319214- Champlin 1**  
**Map Extent - Overview Large Scale**

Imagery: RS Orthomosaic & DSM  
 Imagery Date: 28 Jun 2023  
 Map Date: 25 Jul 2023  
 Datum: WGS 1984 UTM Zone 13N  
 POC: Soil Sage

**Legend**

Wells	Tank Battery
Observation Points	Separator
Flowline (assumed)	Access Road Extent
	Disturbance Extent

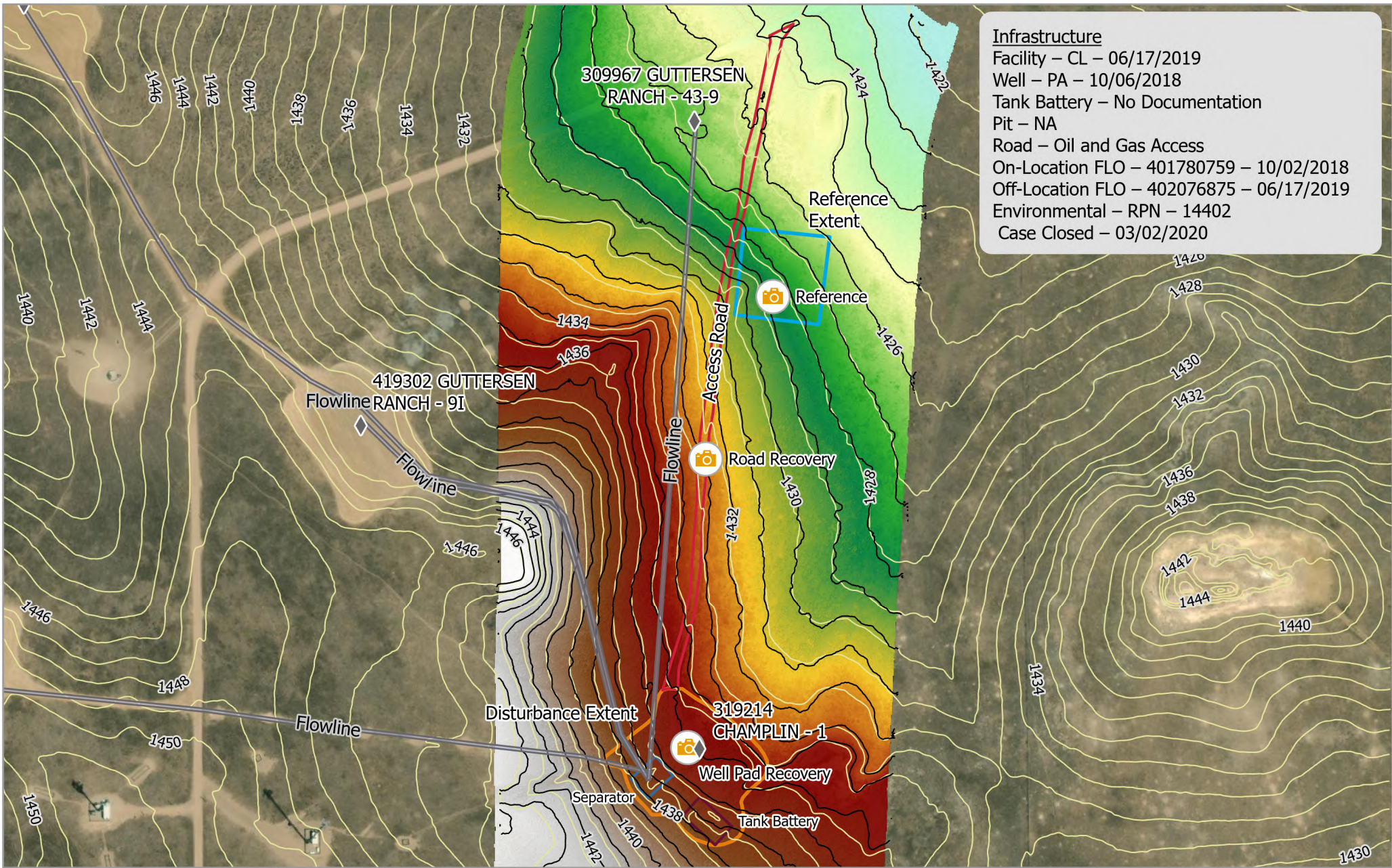
0 20 40 Meters

Total Disturbance: 1.89 Acres  
 Scale: 1:700

Pad Location:  
 40.324640  
 -104.436140



Service Credits - Maxar, Microsoft



**Infrastructure**  
 Facility – CL – 06/17/2019  
 Well – PA – 10/06/2018  
 Tank Battery – No Documentation  
 Pit – NA  
 Road – Oil and Gas Access  
 On-Location FLO – 401780759 – 10/02/2018  
 Off-Location FLO – 402076875 – 06/17/2019  
 Environmental – RPN – 14402  
 Case Closed – 03/02/2020

**CIV - 319214- Champlin 1**

**Map Extent - Elevation & Contours**

Imagery: RS Orthomosaic & DSM, USGS  
 Imagery Date: 28 Jun 2023, 2018  
 Map Date: 25 Jul 2023  
 Datum: WGS 1984 UTM Zone 13N  
 POC: Soil Sage

- ◆ Wells
- 📷 Observation Points
- 📏 1m Contours (2018)
- 📏 1m Contours (2023)
- ▬ Flowline (assumed)
- ▬ Tank Battery
- ▬ Separator
- ▬ Access Road Extent
- ▬ Disturbance Extent
- ▭ Reference Extent
- Elevation Meters
- 1448
- 1418

0 90 180 Meters

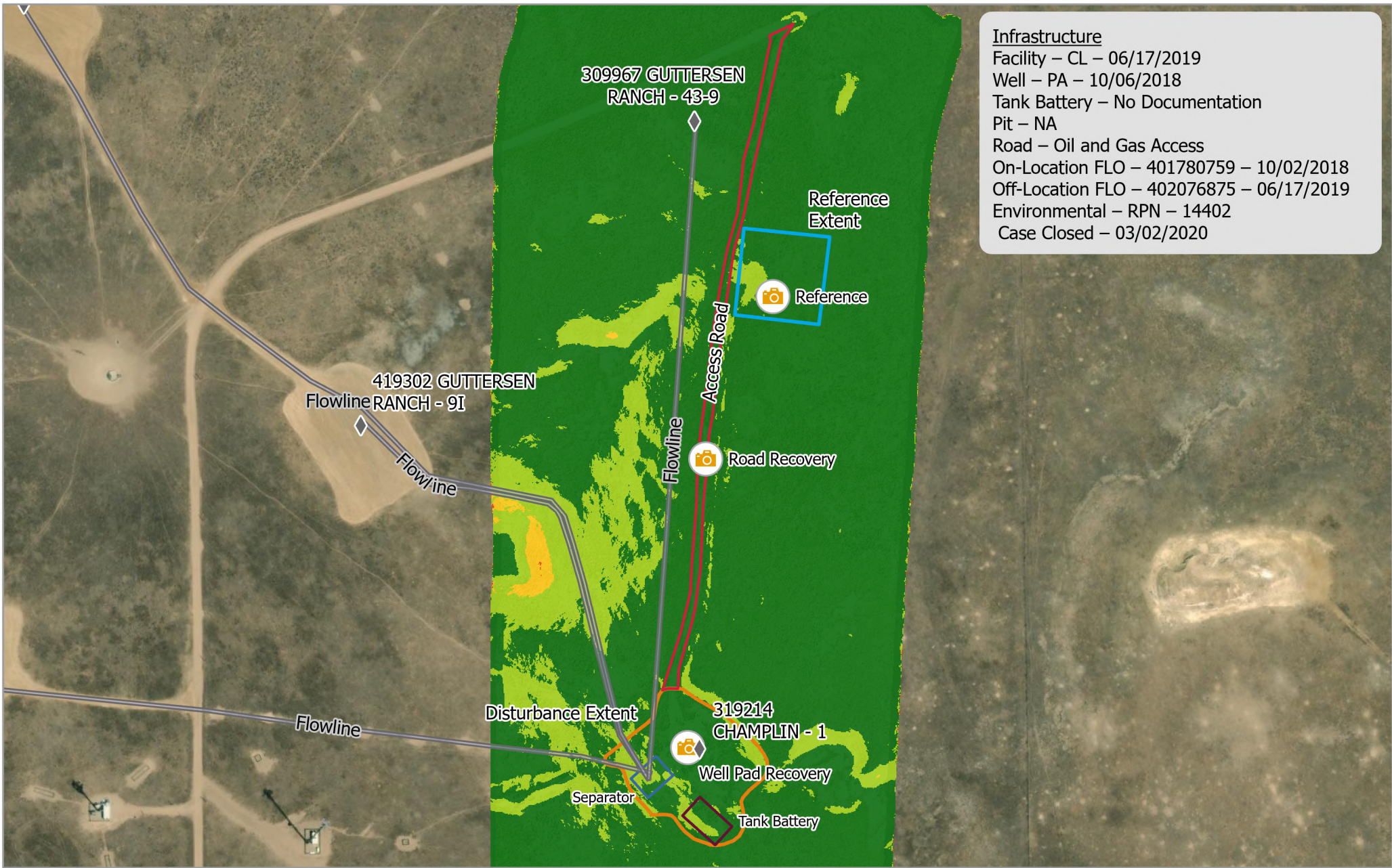
Scale: 1:3,100

Pad Location:  
 40.324640  
 -104.436140

N



Service Credits - Maxar, Microsoft



**Infrastructure**  
 Facility – CL – 06/17/2019  
 Well – PA – 10/06/2018  
 Tank Battery – No Documentation  
 Pit – NA  
 Road – Oil and Gas Access  
 On-Location FLO – 401780759 – 10/02/2018  
 Off-Location FLO – 402076875 – 06/17/2019  
 Environmental – RPN – 14402  
 Case Closed – 03/02/2020

**CIV - 319214- Champlin 1**  
**Map Extent - Slope**  
 Imagery: RS Orthomosaic & DSM, Maxar  
 Imagery Date: 28 Jun 2023, 1 Aug 2020  
 Map Date: 25 Jul 2023  
 Datum: WGS 1984 UTM Zone 13N  
 POC: Soil Sage

◆ Wells	▭ Tank Battery	Slope
📷 Observation Points	▭ Access Road Extent	Percent
▬ Flowline (assumed)	▭ Disturbance Extent	0 - 10
▭ Separator	▭ Reference Extent	10 - 20
		20 - 30
		30 - 300

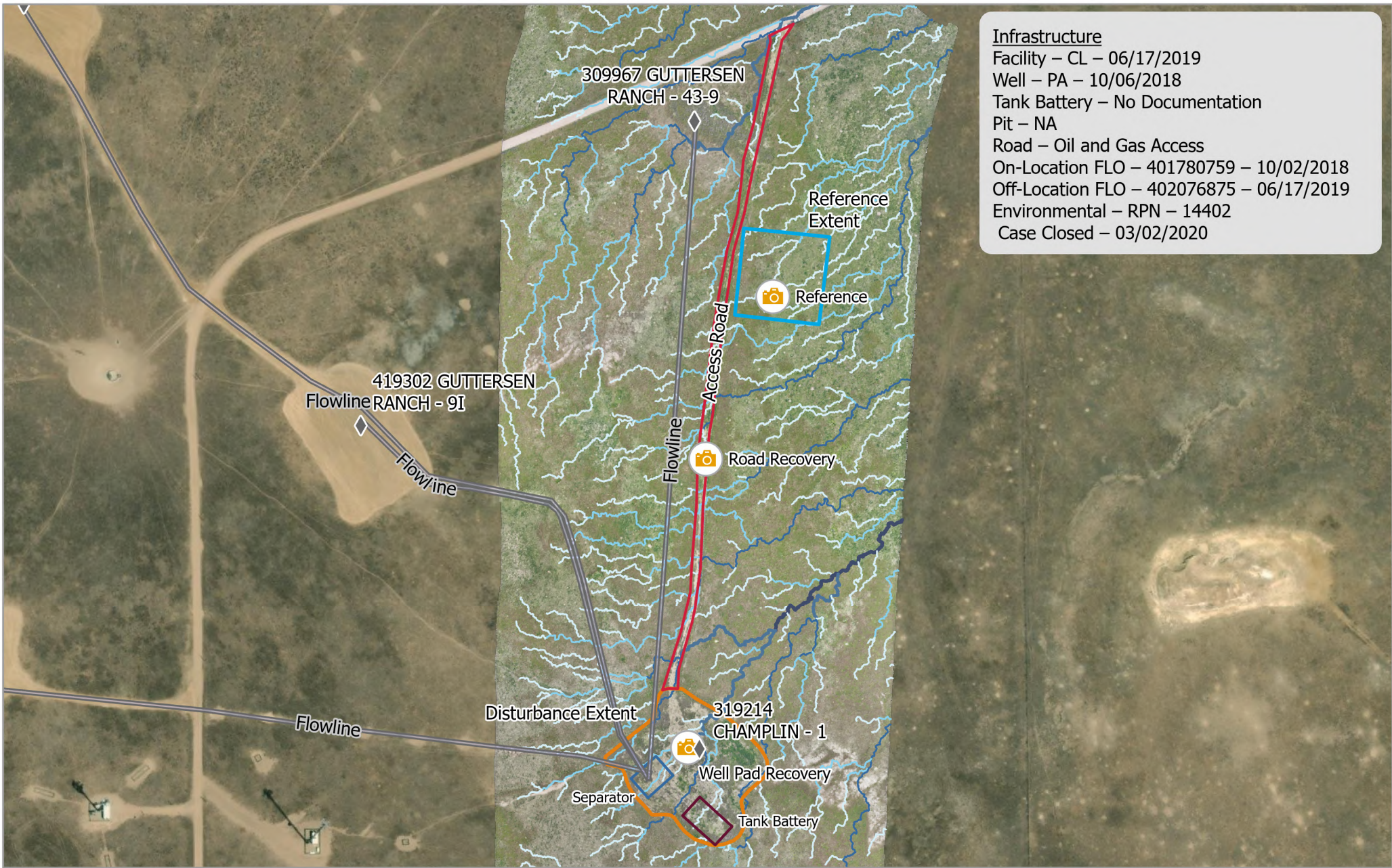
0 90 180 Meters

Scale: 1:3,100

Pad Location:  
 40.324640  
 -104.436140

N





**Infrastructure**  
 Facility – CL – 06/17/2019  
 Well – PA – 10/06/2018  
 Tank Battery – No Documentation  
 Pit – NA  
 Road – Oil and Gas Access  
 On-Location FLO – 401780759 – 10/02/2018  
 Off-Location FLO – 402076875 – 06/17/2019  
 Environmental – RPN – 14402  
 Case Closed – 03/02/2020

**CIV - 319214- Champlin 1  
 Map Extent - Hydrology**

Imagery: RS Orthomosaic & DSM, Maxar  
 Imagery Date: 28 Jun 2023, 1 Aug 2020  
 Map Date: 25 Jul 2023  
 Datum: WGS 1984 UTM Zone 13N  
 POC: Soil Sage

◆ Wells	▭ Separator	Stream Order
📷 Observation Points	▭ Access Road Extent	1
▭ Flowline (assumed)	▭ Disturbance Extent	2
▭ Tank Battery	▭ Reference Extent	3
		4
		5

0 90 180 Meters

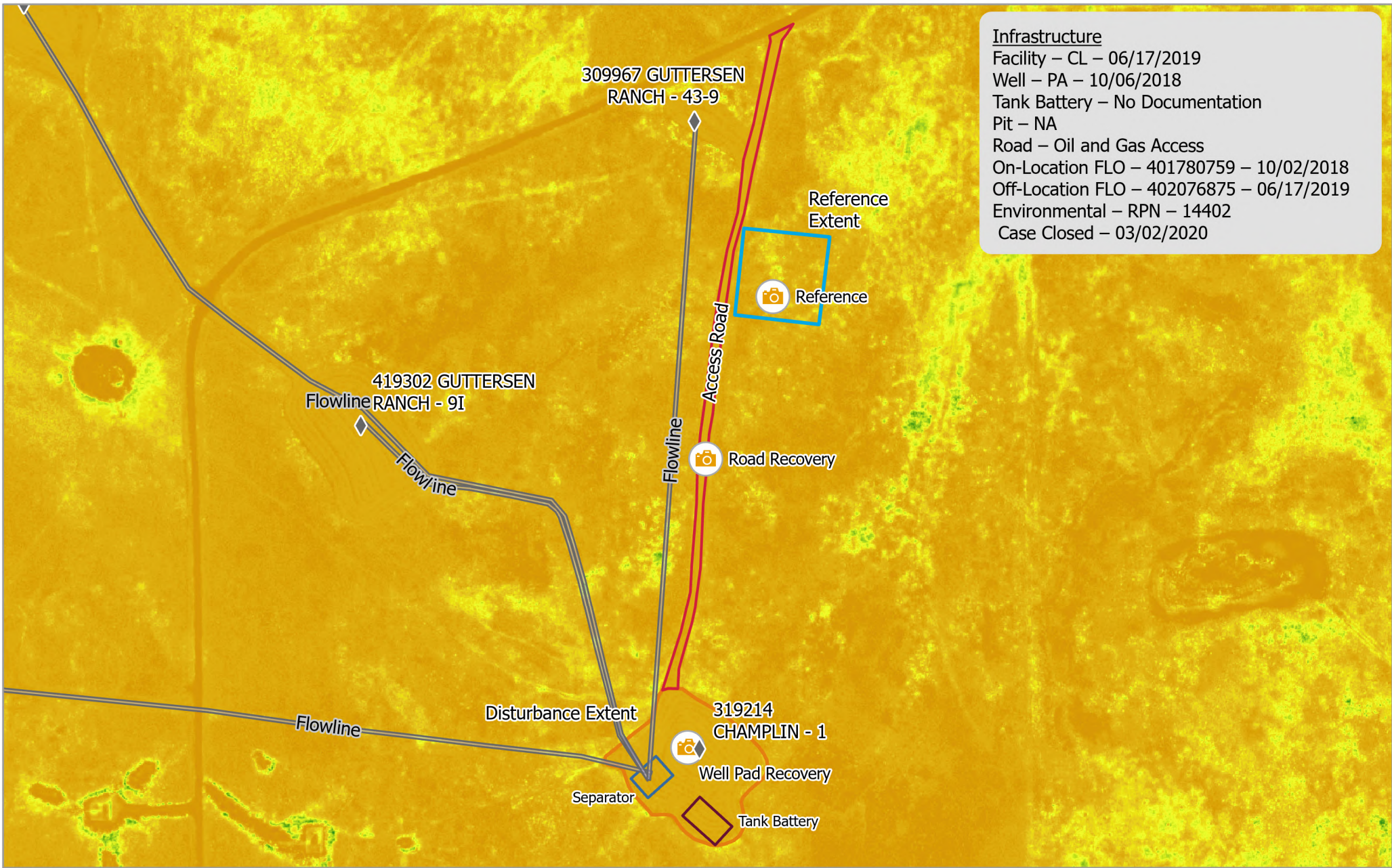
Scale: 1:3,100

Pad Location:  
 40.324640  
 -104.436140

N



Service Credits - Maxar, Microsoft



**Infrastructure**  
 Facility – CL – 06/17/2019  
 Well – PA – 10/06/2018  
 Tank Battery – No Documentation  
 Pit – NA  
 Road – Oil and Gas Access  
 On-Location FLO – 401780759 – 10/02/2018  
 Off-Location FLO – 402076875 – 06/17/2019  
 Environmental – RPN – 14402  
 Case Closed – 03/02/2020

**CIV - 319214- Champlin 1**  
**Map Extent - NAIP NDVI Composite**

Imagery: USDA NAIP  
 Imagery Date: 2011-2021  
 Map Date: 25 Jul 2023  
 Datum: WGS 1984 UTM Zone 13N  
 POC: Soil Sage

**Legend**

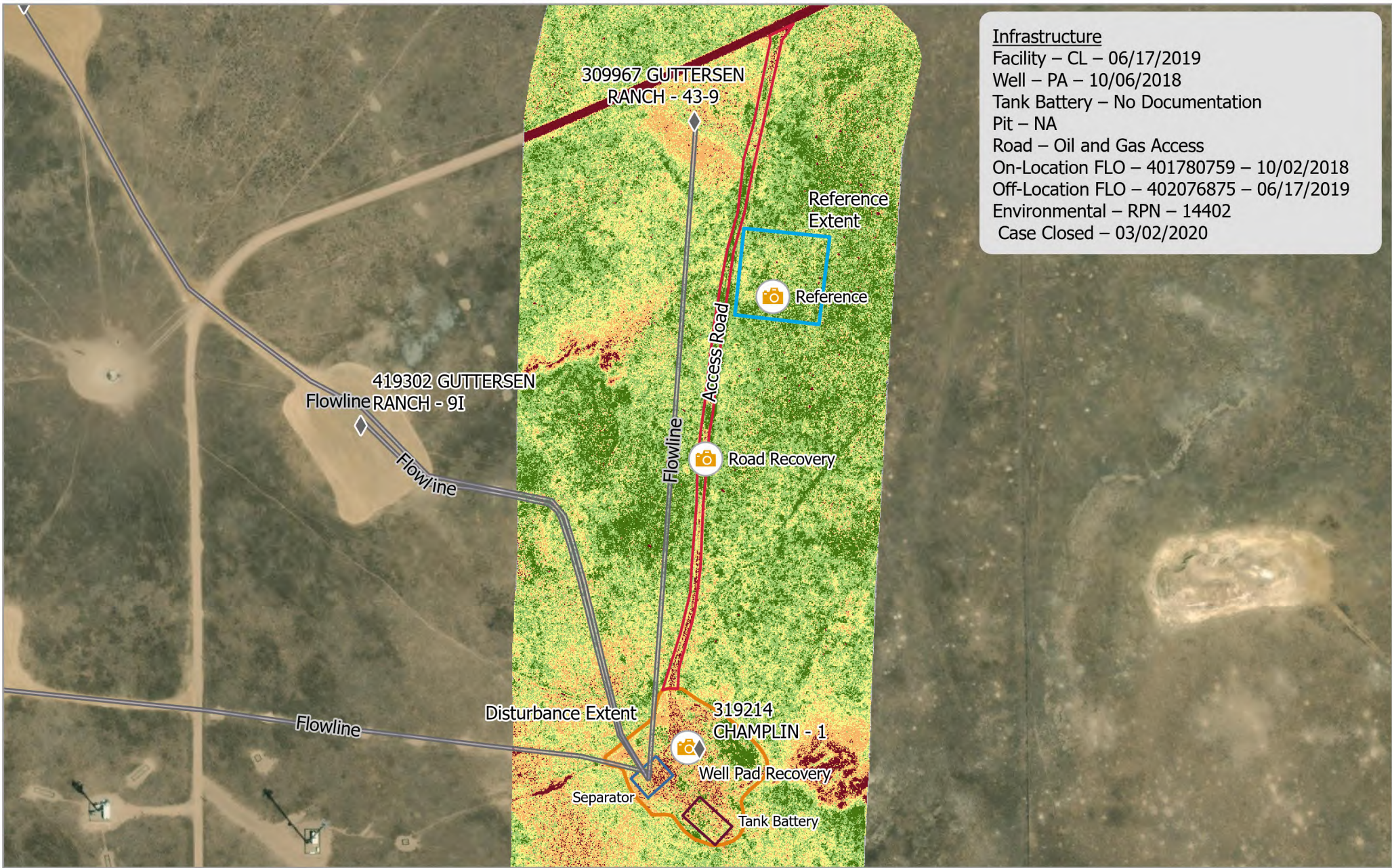
◆ Wells	▭ Disturbance Extent
📷 Observation Points	▭ Reference Extent
▬ Flowline (assumed)	▭ Separator
▭ Access Road Extent	▭ Tank Battery

0 90 180 Meters

Scale: 1:3,100

Pad Location:  
 40.324640  
 -104.436140

N



**Infrastructure**  
 Facility – CL – 06/17/2019  
 Well – PA – 10/06/2018  
 Tank Battery – No Documentation  
 Pit – NA  
 Road – Oil and Gas Access  
 On-Location FLO – 401780759 – 10/02/2018  
 Off-Location FLO – 402076875 – 06/17/2019  
 Environmental – RPN – 14402  
 Case Closed – 03/02/2020

**CIV - 319214- Champlin 1  
 Map Extent - NDVI**

Imagery: RS Multispectral, Maxar  
 Imagery Date: 28 Jun 2023, 1 Aug 2020  
 Map Date: 25 Jul 2023  
 Datum: WGS 1984 UTM Zone 13N  
 POC: Soil Sage

◆ Wells	▬ Flowline (assumed)	NDVI
📷 Observation Points	▬ Access Road Extent	Classes
▭ Separator	▬ Disturbance Extent	■ 1-Veg
▭ Tank Battery	▬ Reference Extent	■ 2-Veg
		■ 3-Non Veg
		■ 4-Non Veg
		■ 5-Non Veg

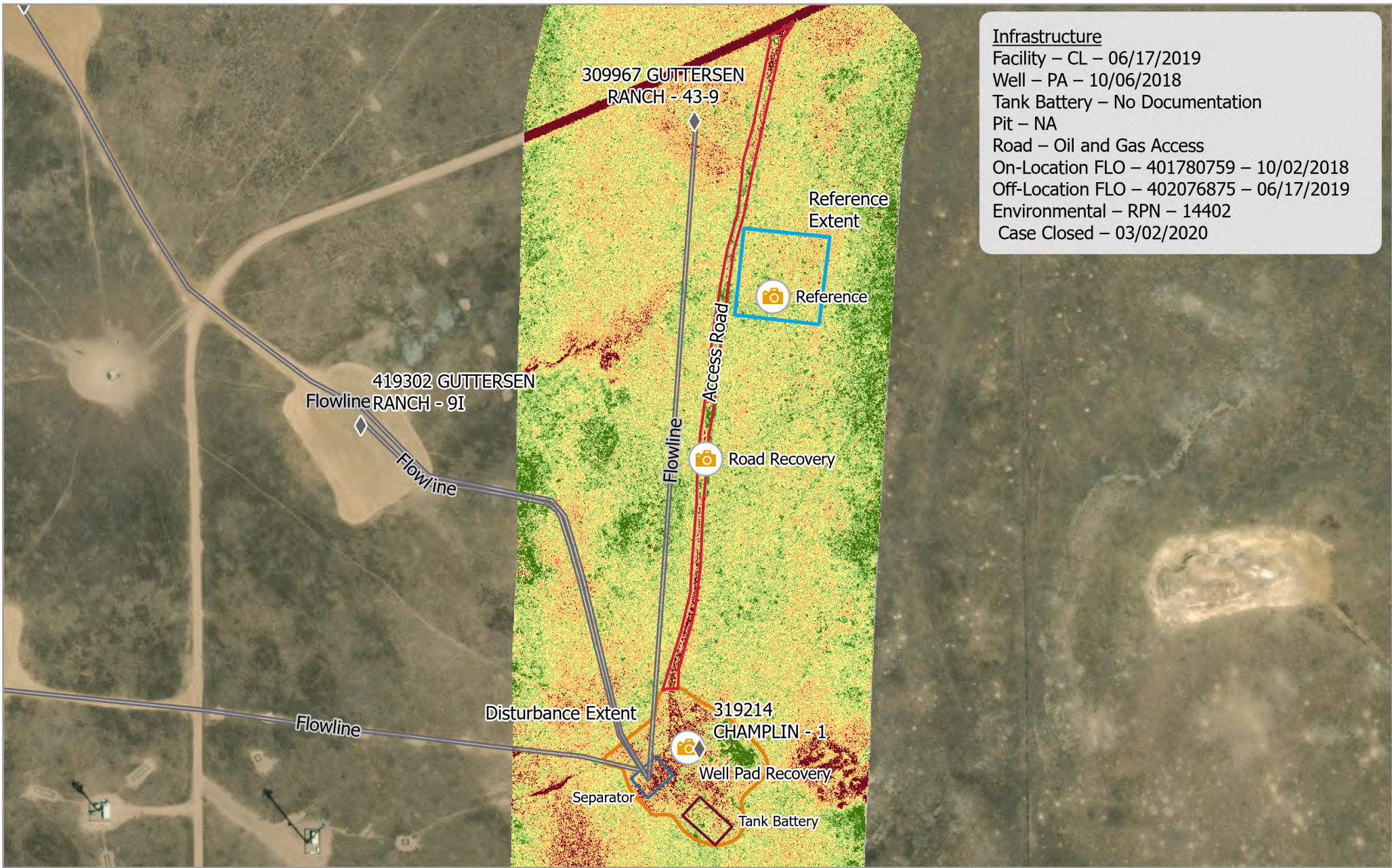
0 90 180 Meters

Scale: 1:3,100

Pad Location:  
 40.324640  
 -104.436140



Service Credits - Maxar, Microsoft



**Infrastructure**  
 Facility – CL – 06/17/2019  
 Well – PA – 10/06/2018  
 Tank Battery – No Documentation  
 Pit – NA  
 Road – Oil and Gas Access  
 On-Location FLO – 401780759 – 10/02/2018  
 Off-Location FLO – 402076875 – 06/17/2019  
 Environmental – RPN – 14402  
 Case Closed – 03/02/2020

**CIV - 319214- Champlin 1  
 Map Extent - NDRE**

Imagery: RS Multispectral, Maxar  
 Imagery Date: 28 Jun 2023, 1 Aug 2020  
 Map Date: 25 Jul 2023  
 Datum: WGS 1984 UTM Zone 13N  
 POC: Soil Sage

◆ Wells	Flowline (assumed)	NDRE
📷 Observation Points	Access Road Extent	Classes
▭ Separator	Disturbance Extent	1-Veg
▭ Tank Battery	Reference Extent	2-Veg
		3-Non Veg
		4-Non Veg
		5-Non Veg

0 90 180 Meters

Scale: 1:3,100

Pad Location:  
 40.324640  
 -104.436140

N



Service Credits - Maxar, Microsoft

# Soil Properties

## USDA Soil Description

### Reference Soil Information

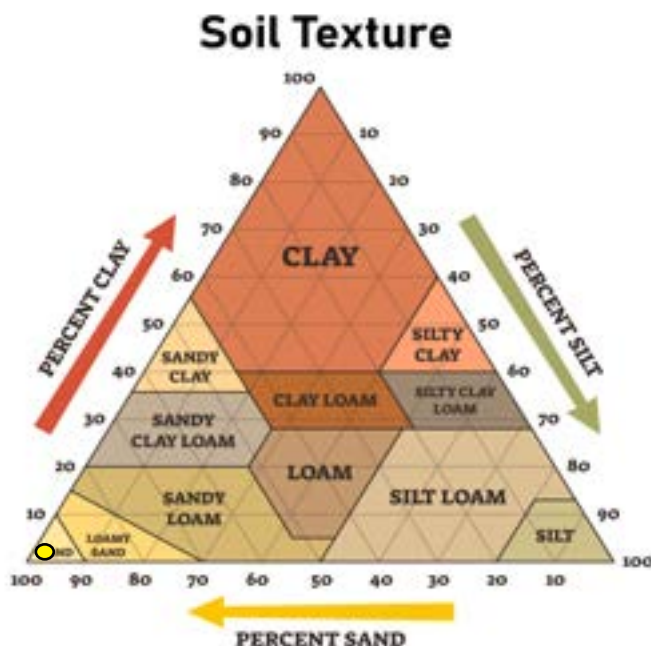
The location of the site is contained within one soil type, Valent sand.

### Map Unit 70 Reference Soil information - Valent sand

This soil is formed from noncalcareous eolian sands. Landform is hills, dunes, with the Deep Sand Ecological Site. Soils are excessively drained with a very low water holding capacity, and slope 3-9 percent.

Depth (in)	Physical			Chemical			
	Texture	Bulk Density	Partical Size Percent sand, silt, clay	pH	EC	SAR	OM%
0-10	Sand	1.63	96-1-3	6.8	0.1	0.0	0.71
10-20	Sand	1.63	97-1-2	7.0	0.1	0.0	0.26
20-30	Sand	1.63	97-1-2	7.0	0.1	0.0	0.20
30-40	Sand	1.63	97-1-2	7.2	0.1	0.0	0.10
40-50	Sand	1.63	97-1-2	7.2	0.1	0.0	0.10
50 +	Sand	1.63	97-1-2	7.2	0.1	0.0	0.10

### Soil Texture Triangle reflect the 0-10 in depth



### Erosion Potential (10 inches)

- K Factor, Whole soil - .02. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.
- Wind Erodibility Group – 1. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible.

## Soil Reference Information

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There is a general relationship of soil bulk density to root growth based on soil texture. Bulk densities ideal for root growth are less than 1.60 g/cc for sandy textures, less than 1.40 g/cc for loamy textures, and less than 1.10 g/cc for clayey textures. Bulk densities that restrict root growth are greater than 1.80 g/cc for sandy textures, 1.65 g/cc for loamy textures, and 1.47 g/cc for clayey textures.

# Vegetation

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## Reference vegetation – Deep Sand Ecology

### Climate

Average Annual Precipitation 14 to 17 inches annually - average 15 inches

Average Annual Air Temperature ranges from 48 to 52 degrees F

Drought conditions in effect

Long-term effects of these latest drought events have yet to be determined. Growth of native cool-season plants begin about April 1 and continue to mid-June. Native warm-season plants begin growth about May 1 and continue to about August 15. Regrowth of cool-season plants occur in September in most years, depending on moisture.

### Reference dynamics

The Reference State is characterized by a dominance of warm-season tallgrasses (sand bluestem, prairie sandreed, switchgrass, and Indiangrass). The Shrub State is dominated by sand sagebrush and a minor component of understory species. The Eroded State is characterized by annual forbs and grasses (kochia, Russian thistle, cheatgrass) and early successional plants (sandhill muhly, sand dropseed, Fendler threeawn, and lemon scurfpea).

Drought has increased mortality of blue grama and other bunchgrasses significantly in some locales.

Dominants are sand bluestem, prairie sandreed, switchgrass and Indiangrass. Sub-dominant grasses include needle and thread, blue grama and little bluestem. Significant forbs and shrubs are pacific peavine, prairie clovers, dotted blazing star (aka dotted gayfeather), leadplant, western sandcherry, and sand sagebrush. The potential vegetation is about 70-85% grasses and grass-like plants, 8-15% forbs and 7-15% woody plants.

Not well suited for carbon sequestration.

## Reference Vegetation – Deep Sand Ecology

### At Risk Plant Community

Key species from the Reference Plant Community, sand bluestem, prairie sandreed, yellow Indiangrass, switchgrass, western sandcherry and leadplant have decreased in frequency and production. Blue grama and sand sagebrush are the dominant species. Sand dropseed, red threeawn, slimflower scurfpea, hairy goldenaster, croton, western ragweed, stickleaf, lupine, loco, and milkvetch have also increased.

The risk of losing some of the tall grass species, palatable forbs and shrubs. The reduction of tall grass species, nitrogen-fixing forbs, key shrub component and increased warm season shortgrass has altered the biotic integrity of this plant community. Nutrient cycle, water cycle and energy flow may be impaired. It will require considerable time and expense to return this community once it crosses a threshold to the shrub state.

# Vegetation

## Deep Sand Ecosystem Vegetative Community Composition

Common Name	Scientific Name
Prairie Sandreed	<i>Calamovilfa longifolia</i>
Sand Bluestem	<i>Andropogon hallii</i>
Switchgrass	<i>Panicum virgatum</i>
Indiangrass	<i>Sorghastrum nutans</i>
Blowout Grass	<i>Redfeldia flexuosa</i>
Little Bluestem	<i>Schizachyrium scoparium</i>
Sideoats Grama	<i>Bouteloua curtipendula</i>
Sand Dropseed	<i>Sporobolus cryptandrus</i>
Blue Grama	<i>Bouteloua gracilis</i>
Western Wheatgrass	<i>Pascopyrum smithii</i>
Needle and Thread	<i>Hesperostipa comata</i> ssp. <i>comata</i>
Indian Ricegrass	<i>Achnatherum hymenoides</i>
Squirreltail	<i>Elymus elymoides</i> ssp. <i>elymoides</i>
Purple Prairie Clover	<i>Dalea purpurea</i> var. <i>purpurea</i>
Painted Milkvetch	<i>Astragalus ceramicus</i> var. <i>filifolius</i>
White Prairie Clover	<i>Dalea candida</i>
Dotted Blazing Star	<i>Liatris punctata</i>
Whitest Evening Primrose	<i>Oenothera albicaulis</i>
Upright Prairie Coneflower	<i>Ratibida coumifera</i>
Broadbeard Beardtongue	<i>Penstemon angustifolius</i>
Scarlet Globemallow	<i>Sphaeralcea coccinea</i>
Annual Buckwheat	<i>Eriogonum annuum</i>