



TOPSOIL PROTECTION PLAN

Oil and Gas Development Plan Shelduck South Pad, Docket #211000200

Shelduck South Pad: Lot 6 Section 6, Township 7 North, Range 60 West

Loc ID 455769, Form 2A Doc #402657658

Weld County, Colorado

- Per Rule 1001.a, Mallard will ensure the surface of the land is restored as nearly as practicable to its condition at the commencement of drilling operations. Within three months following drilling operations, the total footprint of the Shelduck South Pad disturbed area will be reduced from approximately 11.0 acres to 5.6 acres.
- Per Rule 1002.a, During drilling operations on crop lands, when requested by the surface owner, the operator shall delineate each drill site and access road on crop lands constructed after such date by berms, single strand fence, or other equivalent method in order to discourage unnecessary surface disturbances. The location is on rangeland and operator has agreed to install cattle guards and fences where necessary as part of the Surface Use Agreement.
- Per Rule 1002.a, where livestock is in the immediate area and is not fenced out by existing fences, the operator, at the request of the surface owner, will install a fence around the wellhead and production equipment to prevent livestock entry. There will be no pits (including reserve pits) on location, so no fencing around pits will be needed.
- Per Rule 1002.b, Operator shall be responsible for segregating the topsoil, backfilling, re-compacting any backfill, reseeding, and re-contouring the surface of any disturbed area so as not to interfere with Owner's operations and shall reclaim such area to preexisting conditions as best as possible with control of all noxious weeds. Mallard will separate, store, mark, and document the location of stockpiles to facilitate subsequent reclamation. Mallard will segregate the separated horizons based upon noted changes in physical characteristics such as organic content, color, texture, density, or consistency.
- Per Rule, 1002.c, all stockpiled soils shall be protected from degradation due to contamination, compaction and, to the extent practicable, from wind and water erosion during drilling and production operations. Topsoil stockpiles will be located along the west side of the proposed Oil and Gas Location as shown on the Facility Layout Drawings. The maximum height of topsoil stockpiles will be 10 feet.
- Prior to the commencement of pad construction, a geotechnical exploration will be completed by a Geotechnical Engineer consisting of multiple soil bores across the location. The bores will be completed to a depth of approximately 25 feet below the existing surface. These bores will provide a subsurface profile of the soil conditions, including the depth of the topsoil at the location. The Geotechnical Engineering Report will be utilized by the Operator and contractor to ensure the proper depth of topsoil is salvaged and stockpiled.
 - Subsurface Exploration and Laboratory Testing Procedures are anticipated as follows:



Subsurface Exploration Procedures:

Soil borings are advanced with a truck-mounted drill rig using solid-stem continuous-flight augers. Three samples are obtained in the upper 10 feet of each boring and at intervals of 5 feet thereafter. Soil sampling is performed using modified California barrel and standard split-barrel sampling procedures. For the standard split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon is driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at the test depths. For the modified California barrel sampling procedure, a 2½-inch outer diameter split-barrel sampling spoon is used for sampling. Modified California barrel sampling procedures are similar to standard split-barrel sampling procedures; however, blow counts are typically recorded for 6-inch intervals for a total of 12 inches of penetration. The samples are placed in appropriate containers and taken to a soil laboratory for testing and classified by a geotechnical engineer. In addition, groundwater levels are observed and recorded.

The geotechnical exploration team prepares field boring logs as part of standard drilling operations including sampling depths, penetration distances, and other relevant sampling information. Field logs include visual classifications of materials encountered during drilling, and our interpretation of subsurface conditions between samples. Final boring logs, prepared from field logs, represent the geotechnical engineer's interpretation, and include modifications based on observations and laboratory test results.

Laboratory Testing Procedures: The project engineer reviews field data and assigned various laboratory tests to better understand the engineering properties of various vegetative layers, soil, and bedrock strata. Laboratory testing is conducted in general accordance with applicable or other locally recognized standards. Testing was performed under the direction of a geotechnical engineer and included the following:

- | | |
|---|--|
| <ul style="list-style-type: none">✓ Visual classification✓ Moisture content✓ Dry density✓ Atterberg limits | <ul style="list-style-type: none">✓ Grain-size analysis✓ One-dimensional swell✓ Corrosive properties✓ Unconfined compressive strength |
|---|--|

Our laboratory testing program included examination of soil samples by an engineer. Based on the material's texture and plasticity, we described and classified soil samples in accordance with the Unified Soil Classification System (USCS).

- Based on topsoil depths encountered at nearby locations, a topsoil depth of 6 inches was assumed for preparation of the proposed grading design. Salvaging 6 inches of topsoil across the locations, results in a topsoil stockpile of 5,437 cubic yards. The anticipated location of the topsoil stockpile is along the north edge of the location. Once the Geotechnical Engineering Report is complete and the true depth of topsoil is known, the grading design will be updated to reflect field results. This may result in more or less salvaged topsoil.

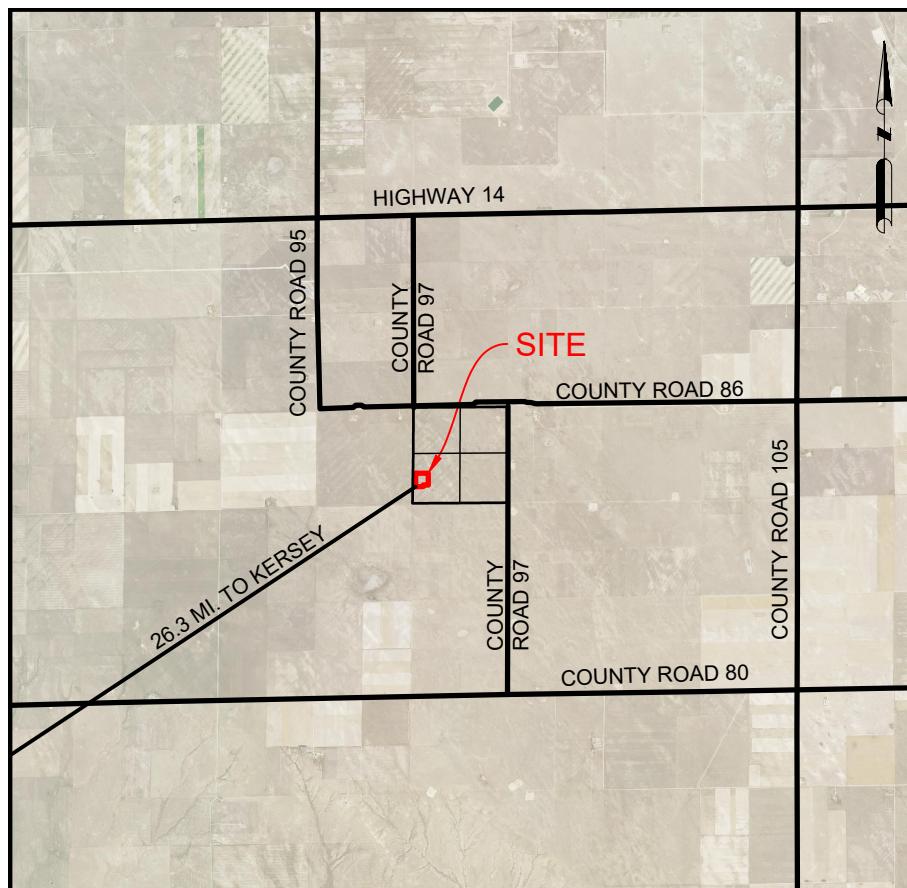


- The topsoil stockpile shall have a maximum height of 10 feet with maximum side slopes of 4:1.
- The topsoil stockpile will be protected from erosion through use of surface roughening and tracking, seeding with crimped straw mulching or hydroseeding, and if necessary, erosion control logs will be installed along the toe of the stockpile.
- The topsoil stockpile will be inspected for weed infestation areas and prompt action consisting of spraying will be taken to mitigate any identified infested areas. All noxious weeds identified will not be allowed to reach the flowering or seed dispersal stage.
- Methods to maintain microbial activity may include avoiding disturbing the topsoil stockpile, applying straw mulch to provide nutrients and maintain moisture, avoiding the use of pesticides on the stockpile, watering the stockpile at regular intervals, and/or planting a cover crop.

Exhibits/References/Appendices

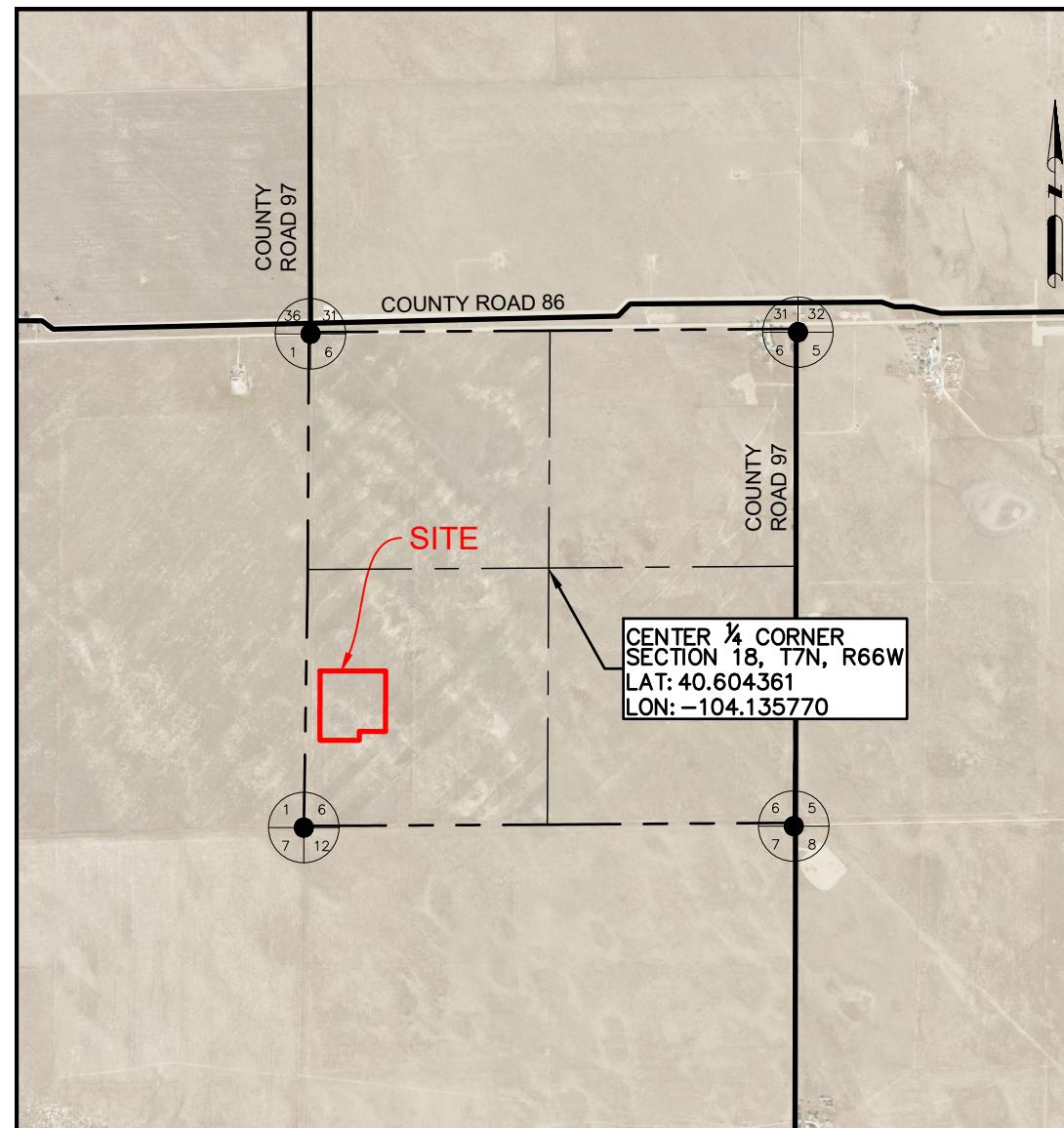
Soil Bore Exhibit
Layout Drawings

SHELDUCK SOUTH PAD LAYOUT DRAWINGS



REGIONAL MAP

N.T.S.



VICINITY MAP

N.T.S.

DATA SOURCE:
AERIAL IMAGERY: NAIP 2019

PUBLICLY AVAILABLE DATA SOURCES HAVE NOT
BEEN INDEPENDENTLY VERIFIED BY ASCENT.

DISCLAIMER:
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DRAWING INDEX		
SHEET NO.	TITLE	REV.
1	COVER SHEET	3
2	PAD LAYOUT	3
3	CROSS SECTIONS	0
4	RIG LAYOUT	2
5	WELL COMPLETION & STIMULATION LAYOUT	2
6	FLOWBACK EQUIPMENT LAYOUT	2
7	PRODUCTION LAYOUT	2
8	RECLAMATION LAYOUT	3

SHEET NAME:	COVER SHEET	SURFACE LOCATION SHELDUCK SOUTH PAD LOT 6 SECTION 6, T7N, R66W, 6TH P.M. WELD COUNTY, COLORADO
FIELD DATE:	06-12-2020	
DRAWING DATE:	05-26-2021	
DRAFTED BY:	DP	
SHEET NO.	01 OF 08	

SHELDUCK SOUTH PAD LAYOUT DRAWINGS

SITE QUANTITIES

OIL & GAS LOCATION AREA WORKING PAD SURFACE AREA ACCESS ROAD DISTURBANCE AREA

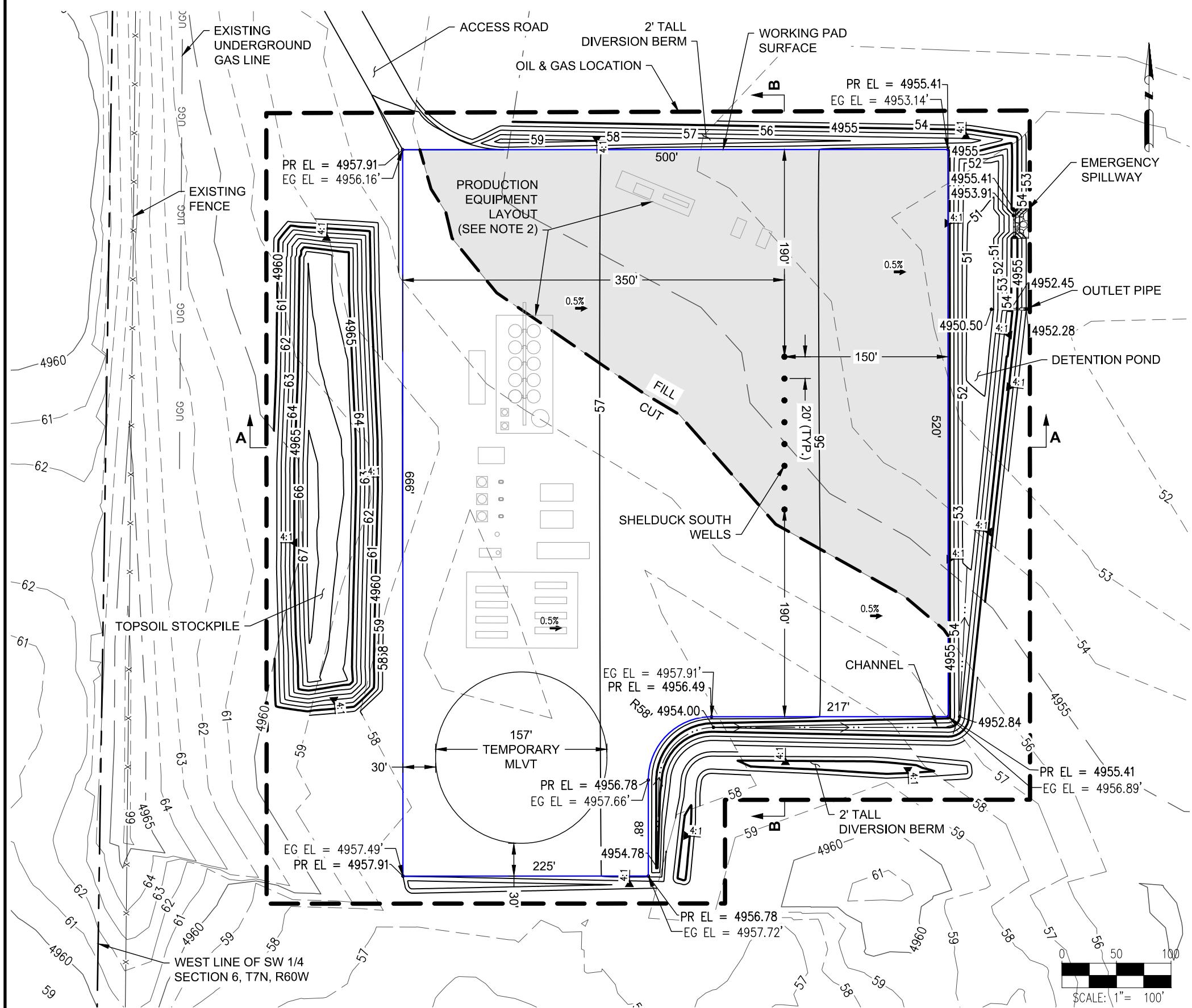
11.0 ACRES
6.7 ACRES
2.6 ACRES



ASCENT GEOMATICS SOLUTIONS
8620 WOLFF COURT
WESTMINSTER, CO 80031
(303) 928-7128

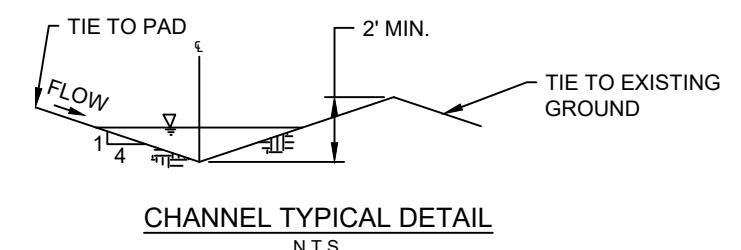
SHEET NAME :
PAD LAYO
SURFACE LOCATION
SHELDUCK SOUTHERN
LOT 6 SECTION
T7N, R60W, 6TH
WELD COUNTY, CO

REV.	DATE	FIELD DATE:	INITIALS
0	5/28/21	06-12-2020	DP
		DRAWING DATE:	DP
1	9/30/21	05-26-2021	DP
		DRAFTED BY:	DP
		HEET NO.	—
2	12/1/21	02 OF 08	RMC
3	12/16/22	02 OF 08	RMC
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 3. THERE IS NO PIPELINE OR UTILITY DISTURBANCE ANTICIPATED AT THIS TIME.
 4. ALL PRODUCTION FACILITY EQUIPMENT IS PERMANENT UNLESS OTHERWISE NOTED.



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SHELDUCK SOUTH PAD LAYOUT DRAWINGS



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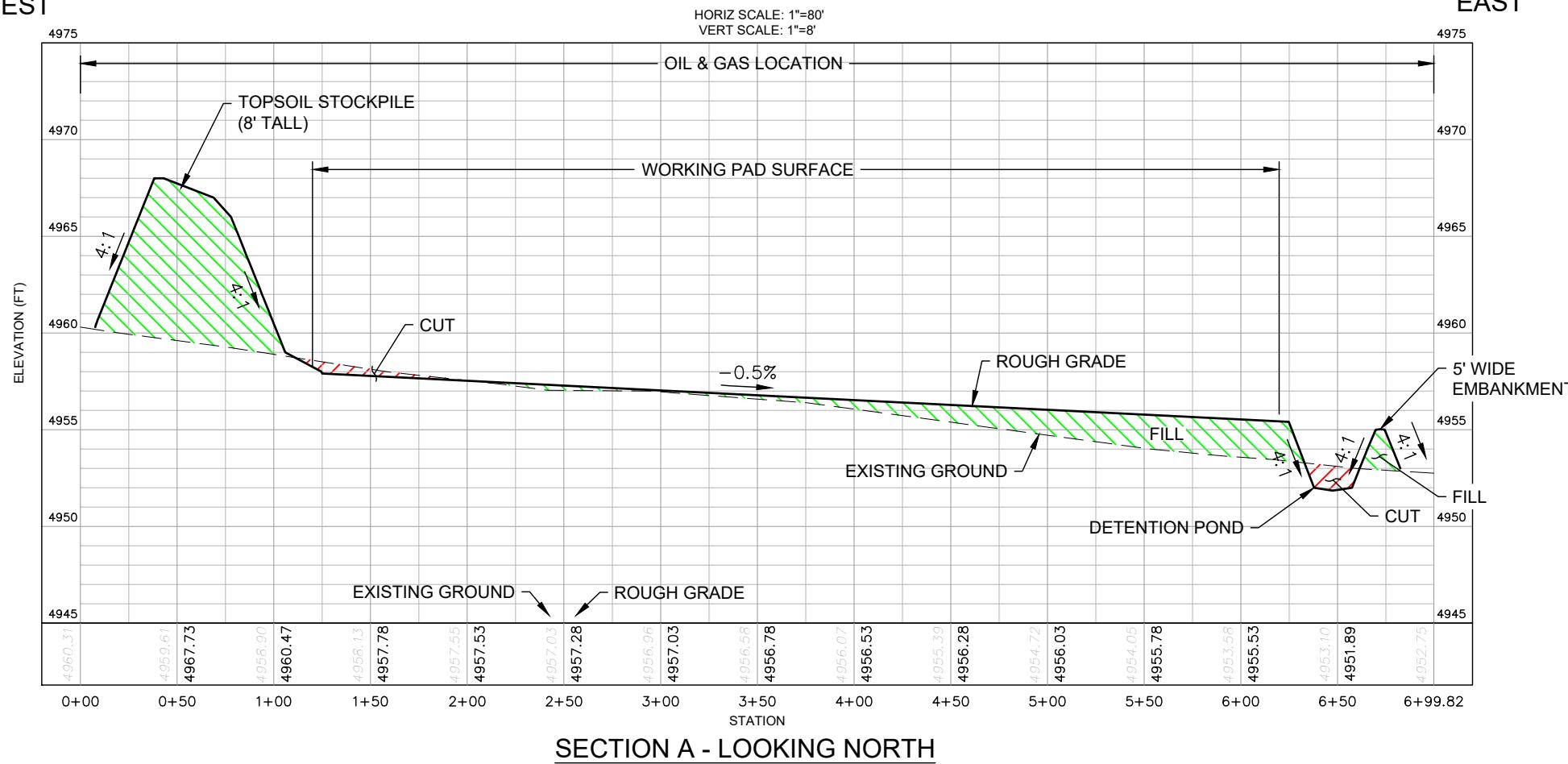
PREPARED FOR:
MALLARD
EXPLORATION

MALLARD EXPLORATION
1400 16TH STREET MALL
DENVER, CO 80202
(720) 543-7951

SHEET NAME:
CROSS SECTIONS
SURFACE LOCATION
SHELDUCK SOUTH PAD
LOT 6 SECTION 6,
T7N, R6W, 6TH P.M.
WELD COUNTY, COLORADO

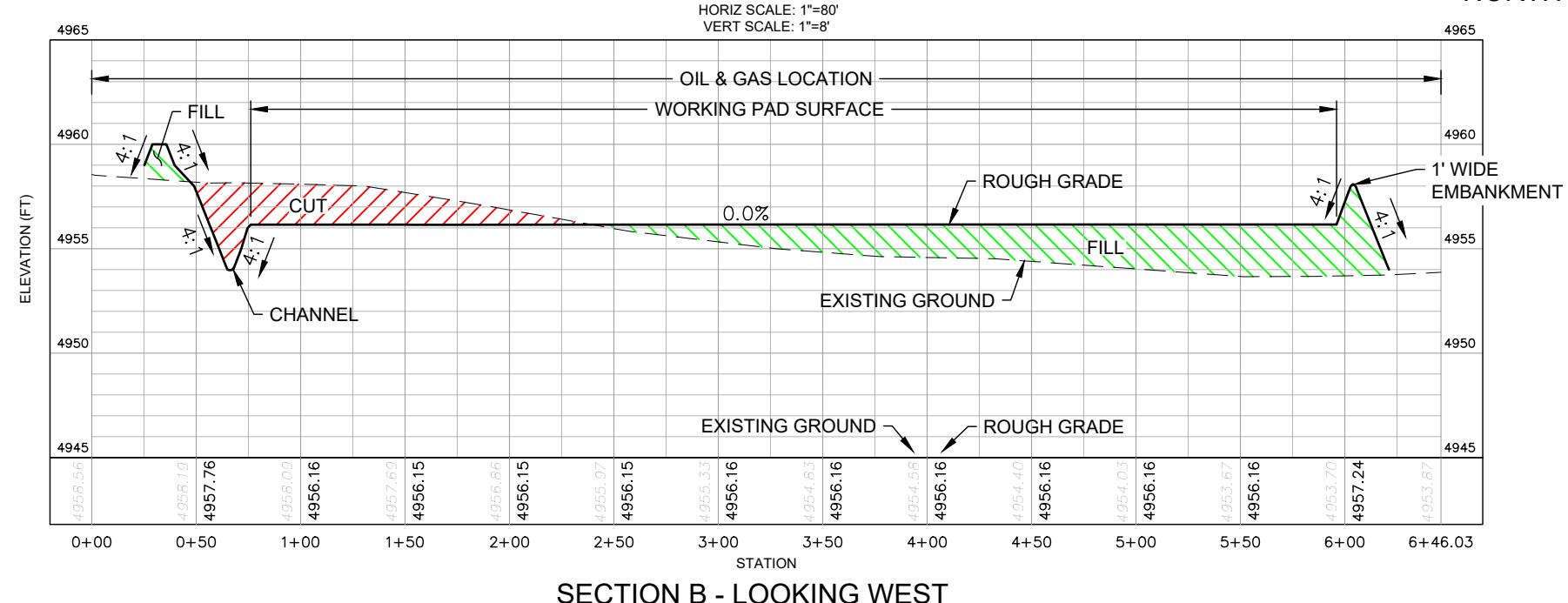
WEST

EAST



SOUTH

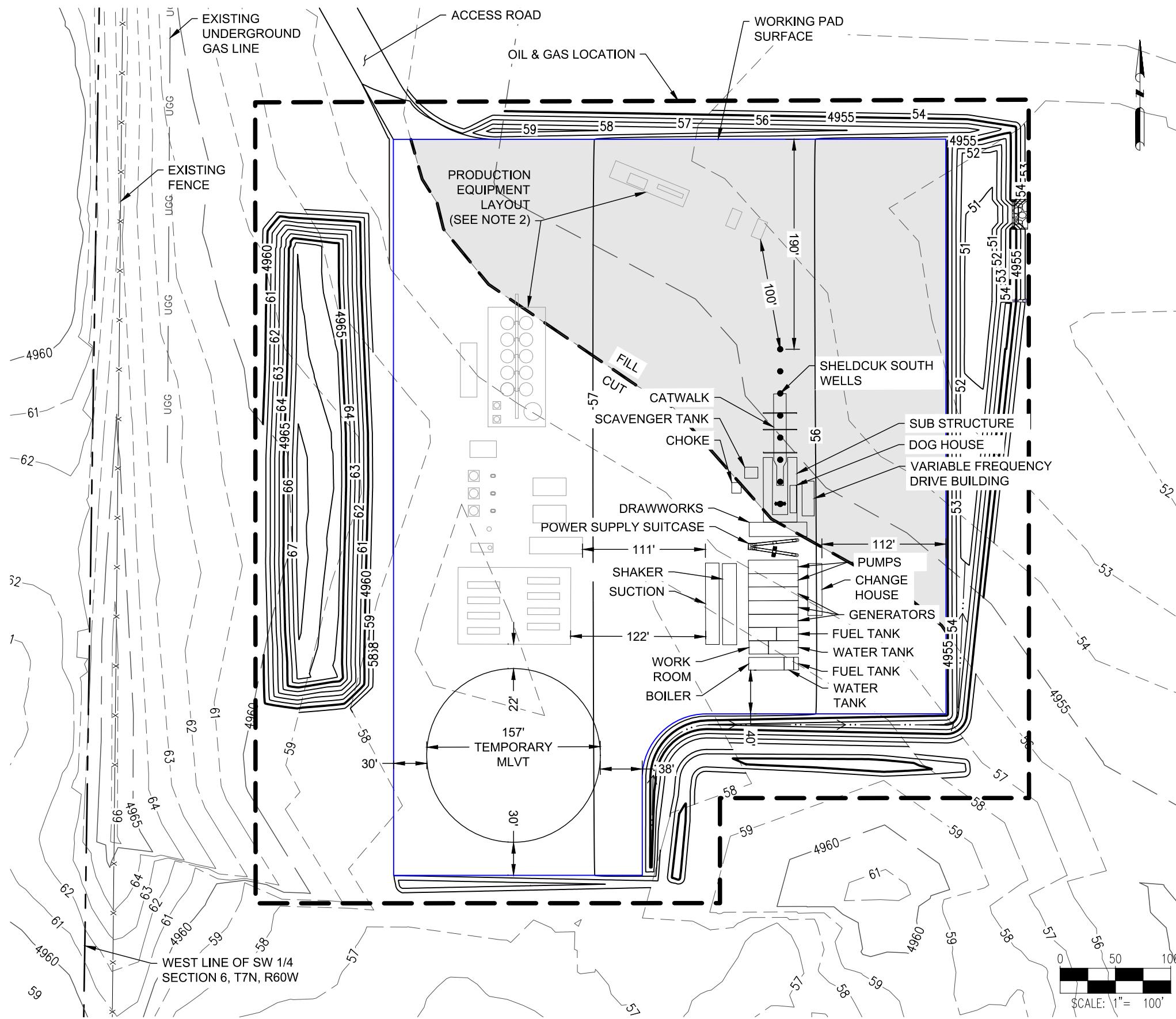
NORTH



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FIELD DATE:	06-12-2020
DRAWING DATE:	05-26-2021
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SHEET NO.	03 OF 08

SHELDUCK SOUTH PAD LAYOUT DRAWINGS



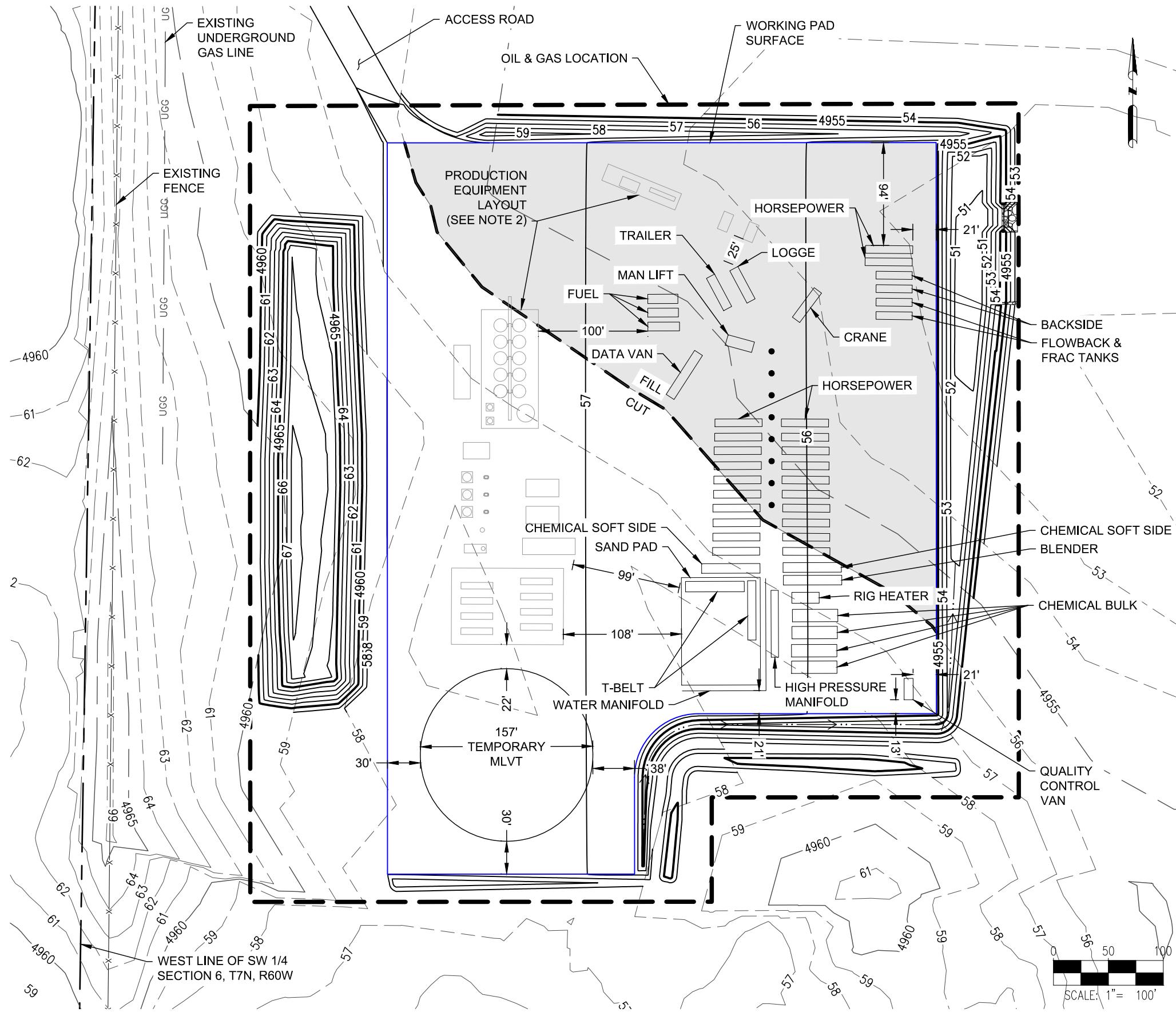
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SHELDUCK SOUTH PAD LAYOUT DRAWINGS



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MALLARD EXPLORATION
1400 16TH STREET MALL
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(720) 543-7951

SHEET NAME:
WELL COMPLETIONS & STIMULATION

SURFACE LOCATION:
SHELDUCK SOUTH PAD
LOT 6 SECTION 6,
T7N, R60W, 6TH P.M.
WELD COUNTY, COLORADO

REV.	DATE	REVISION DESCRIPTION	INT. DP	WELL COMPLETIONS
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1	9/30/21	ISSUED FOR CONSTRUCTION	DP	
2	12/16/21	ISSUED FOR CONSTRUCTION	RMC	

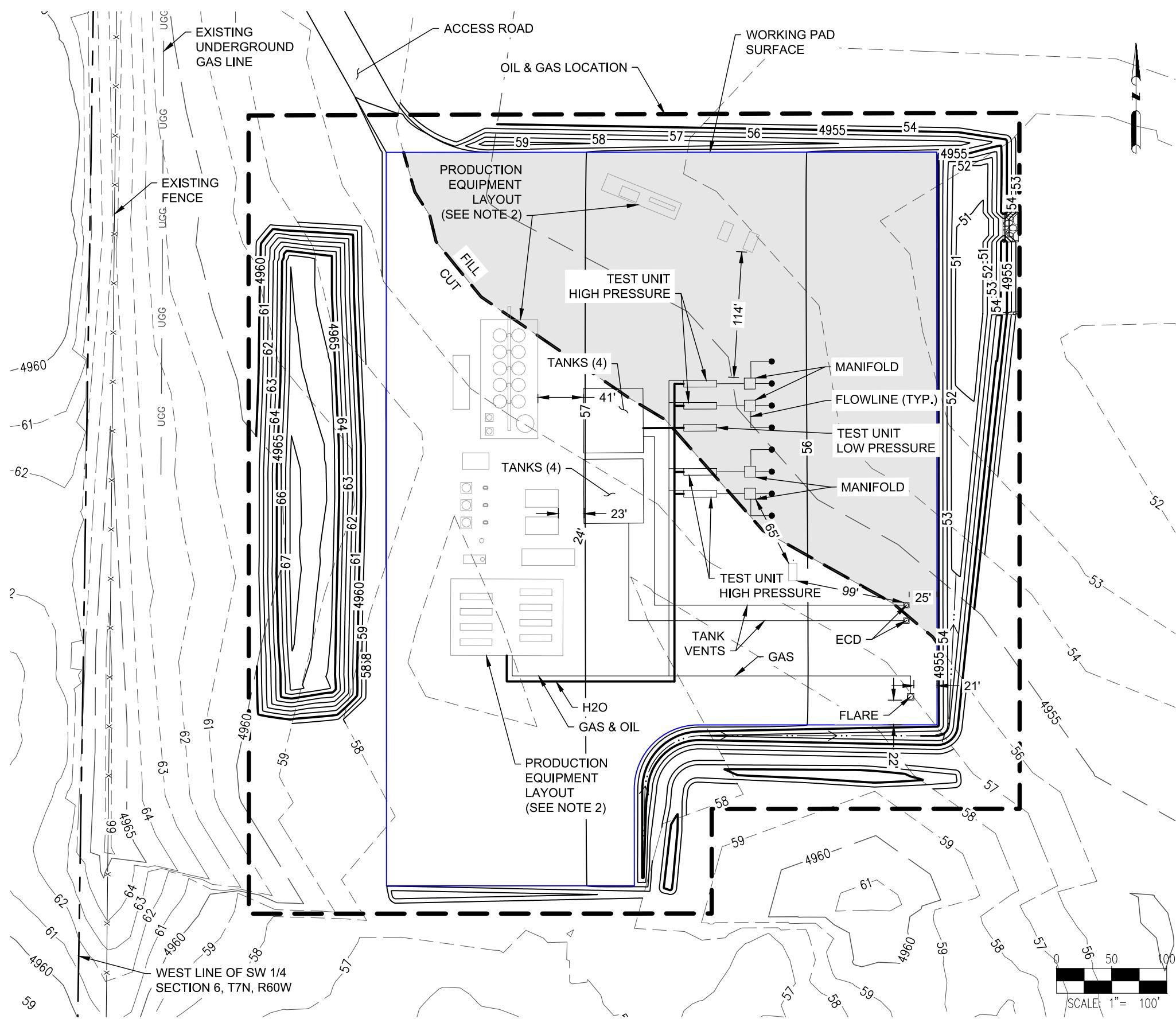
FIELD DATE: 06-12-2020
DRAWING DATE: 05-26-2021
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SHEET NO. 05 OF 08

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SCALE: 1" = 100'

SHELDUCK SOUTH PAD LAYOUT DRAWINGS



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SHEET NAME: FLOWBACK EQUIPMENT LAYOUT
SURFACE LOCATION: SHELDUCK SOUTH PAD
LOT 6 SECTION 6,
T7N, R6W, 6TH P.M.
WELD COUNTY, COLORADO

REV.	DATE	REVISION DESCRIPTION	INT. DP	FIELD DATE:
0	5/28/21	ISSUED FOR CONSTRUCTION	DP	06-12-2020
1	9/30/21	ISSUED FOR CONSTRUCTION	DP	DRAWING DATE:
2	12/16/21	ISSUED FOR CONSTRUCTION	RMC	05-26-2021
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06	OF	08		

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SHELDUCK SOUTH PAD LAYOUT DRAWINGS



ASCENT GEOMATICS SOLUTIONS
8620 WOLFF COURT
WESTMINSTER, CO 80031
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The logo consists of a stylized bird with its wings spread wide, perched above the word "MALLARD" in a bold, sans-serif font.

ALLIARD EXPLORATION
100 16TH STREET MALL
DENVER, CO 80202
(720) 543-7951

PRODUCTION LAYOUT

SHEET NAME : SURFACE LOCATION
SHEDUCK SOUTH PAD
LOT 6 SECTION 6,
T7N, R60W, 6TH P.M.
WELD COUNTY, COLORADO

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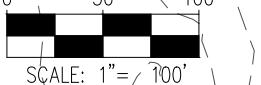
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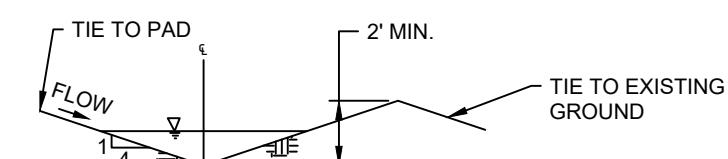
RECLAMATION
SURFACE LOCAT
SHELDUCK SOU
LOT 6 SECTION
T7N, R60W, 6TH
WEIRD COUNTY CO

Page 1

SITE QUANTITIES

RECLAIMED AREA
PERMANENT DISTURBANCE AREA
OIL & GAS LOCATION AREA

5.4 ACRES
5.6 ACRES
11.0 ACRES



CHANNEL TYPICAL DETAIL

- NOTES:**

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2	12/1/21	ISSUED FOR CONSTRUCTION	RMC
3	12/16/21	ISSUED FOR CONSTRUCTION	RMC
-	-	-	-
FIELD DATE:		06-12-2020	
DRAWING DATE:		05-26-2021	
DRAFTED BY:		DP	
EET NO.		08	OF 08