Topsoil Protection Plan

Date: 5/12/2023

Location: OGDP DP455 / YY18-07 Pad

Legal Description: SWNE Section 18, Township 2 North, Range 63 West, 6th P.M., Weld County, Colorado

Location Information

This document provides site-specific information for the OGDP DP455 YY18-07 Pad. The information in this document relates specifically to the time during the construction, drilling, completion, and production of the eight (8) proposed horizontal wells on this location.

The proposed location is northeast of the intersection of Weld County Road 59 and Weld County Road 20. The Pad will be in the SWNE Section 18, Township 2 North, Range 63 West, 6th P.M. zoned agricultural within the Weld County Near-Urban Planning Area.

The proposed YY18-07 Pad oil and gas location disturbance will be 9.6 acres, reduced to 2.3 acres after interim reclamation. The proposed working pad surface will be 6.4 acres. The YY18-07 Pad will be on Weld County Parcel 130318000012 owned by Guttersen Ranches LLC. The location is currently used for rangeland.

The YY18-07 Pad will produce to the existing Y11-28 Multi (COGCC Location ID: 450627) located to the northwest. Equipment at the YY18-07 Pad will include chemical injection skids, meter buildings, multi-phase flow meters, a communication tower, flowline manifolds, a temporary MLVT, and solar skids.

Phase	Duration (days)	Estimated Start Date
Construction (Daylight Only)	60 days	4th Quarter 2024
Drilling	40 days	1st Quarter 2025
Completion	40 days	4th Quarter 2025
Flowback	N/A	Flowing back directly to permanent facility
Production	30 years	4th Quarter 2025
Interim Reclamation (Daylight Only)	60 days	1st Quarter 2026

Potentially Impacted Parties

The Working Pad Surface of the YY18-07 Pad is within 2,000 feet of zero (0) Residential Building Units, zero (0) High Occupancy Building Units (HOBUs), and zero (0) Designated Outside Activity Areas. The nearest Disproportionately Impacted Community (DIC) is over 1 mile from the location. The location is not within COGCC designated High Priority Habitat (HPH).

The YY18-07 Pad is within 2,000 feet of the municipal boundary of Keenesburg. Noble has submitted a COGCC Rule 302.e. Notice to Proximate Local Government and has consulted with the Town of Keenesburg. The Town of Keenesburg has no objections to the location of the proposed Pad. Noble is in the process of amending an existing Road Maintenance Agreement (RMA) with the Town of Keenesburg to address use of Town roads for this project.

Rule Reference

1002.c. **Protection of soils.** 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. Best management practices to prevent weed establishment and to maintain soil microbial activity shall be implemented.

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.

COGCC Variance for Rule 1002.b & Alternative Reclamation Plan

Per Rule, 1002.b **Soil removal and segregation.** During excavation operations, soils will be removed and stockpiled by soil horizon, to facilitate subsequent reclamation.

However, this oil and gas location has little soil that could be classified as topsoil, and any attempts to scrape and collect topsoil would be ineffective. The top layer of soil has been identified as sand mixed with aggregate with little humus, which generally would not qualify as topsoil material. Based on these conditions, the potential for reuse in agricultural operations is limited. Since any stockpiled soil would consist primarily of sand, stabilization would also be difficult and increase chances of erosion and damage to adjacent lands.

Therefore, Noble has entered into an Alternative Reclamation Plan with the landowner, in which topsoil will not be removed and segregated. Under this agreement, approved soil will be imported for interim reclamation in lieu of reusing on-site segregated topsoil. The Alternative Reclamation Plan, signed by Noble and the landowner, has been included as part of a COGCC Rule 1002.b. variance request that is being submitted with the YY18-07 Form 2A application.

Requirements / Recommendations

1. ***The Topsoil Protection Plan should be completed by a person with experience in field soil identification and reclamation techniques and standards.***

   A Chevron designated employee has completed the Topsoil Protection Plan for the YY18-07 Pad.

2. ***On both crop land and non-crop land, soil horizons must be identified based on physical characteristics to allow for proper stockpile segregation and storage. In the event there is a plow layer, the entire plow layer will be considered topsoil and must be salvaged.***

   Soil horizons were not identified. An Alternative Reclamation Plan is proposed for this location.

3. ***The plan should use standard terminology and indicators to define the soil horizons. All applicable horizons should be identified, including the A horizon (topsoil), B horizon (subsoil) and C horizon (substratum or parent material).***

   Soil horizons were not identified. An Alternative Reclamation Plan is proposed for this location.

4. ***Soil test pits should be dug at the proposed location to determine the site-specific soil horizons and soil thicknesses.***

   Topsoil thickness was not measured. An Alternative Reclamation Plan is proposed for this location.

5. ***The plan should include a scaled aerial photograph or diagram showing the USDA Natural Resource Conservation Service (NRCS) soil types and the site-specific soil test pit locations.***

   The NRCS Custom Soil Resource Report has been attached. Soil test pits were not used to identify topsoil thickness as an Alternative Reclamation Plan is proposed for this location.

6. ***The plan should include a description of the soil horizon thicknesses and include an evaluation of the soil characteristics. The evaluation may include descriptions of the texture, Munsell color, structure type, organic matter, density and gravel content.***

   Soil horizons and topsoil thickness were not evaluated as an Alternative Reclamation Plan is proposed for this location.

7. ***Total available topsoil to be salvaged in cubic yards, per the sampling profiles.***

   No topsoil will be salvaged under the proposed Alternative Reclamation Plan. Note that the attached construction layout drawings show a net excess of 278 CY soil; however, this small volume of soil is negligible over the footprint of the WPS and will be used during construction. There will not be any stockpiled soils at the location.

8. ***Seeding and Soil Stabilization Methods***

   Please refer to the Stormwater Management Plan for the YY18-07 Pad, specifically *Section 2: Site Description and Section 2.2: Sequence of Major Construction Activities* for a description of construction stages and *Section 4: Stormwater Management Controls Section 4.1: Control Measure Implementation* for stabilization and control measures implemented during each stage of operations.

   Additional seeding and soil stabilization methods are discussed below.

Seeding (S)

Description

Temporary seeding can be used to stabilize disturbed areas that will be inactive for an extended period. Permanent seeding should be used to stabilize areas where surface disturbance activities are complete and where the surface will not be otherwise stabilized. Effective seeding includes preparation of a seedbed, selection of an appropriate seed mixture, proper planting techniques, and protection of the seeded area with mulch, geotextiles, or other appropriate measures. This typically occurs in a multi-step process which includes: ripping, seeding, spreading a mulch layer such as straw, and, if applicable, crimping the straw into the soil. Seeding establishes vegetation that reduces erosion and sediment displacement by stabilizing disturbed areas in a manner that is economical, adaptable to site conditions, and allows selection of the most appropriate plant material. Seeding also:

- Absorbs the impact of raindrops;
- Reduces the velocity of runoff;
- Reduces runoff volumes by increasing water percolation into the soil;

- Binds soil with roots;
- Protects soil from wind;
- Improves wildlife habitat; and
- Restores the site to a natural state.

Applicability

Seeding is most effective on slopes no steeper than 2:1. Seeding may be implemented on steeper slopes, but care should be taken to mitigate erosion and loss of seed and topsoil. Seeding may be used as a permanent control or a temporary control in areas where exposed soil surfaces are not to be re- graded for extended periods. Such areas include temporarily idle areas, soil stockpiles, berms, temporary road banks, etc. Permanent seeding practices are applied to disturbed areas not otherwise stabilized with rock, road base, or similar.

Limitations

The effectiveness of seeding can be limited by:

- High erosion potential during establishment;
- The need for stable soil temperature and soil moisture content during germination and early growth;
- The need to re-seed areas that fail to establish; and
- Limited seeding times depending on the season.
- Vegetation should not be established on slopes that are unsuitable due to inappropriate soil texture, poor internal structure or internal drainage, volume of overland flow, or excessive steepness, until measures have been taken to correct these problems.

Proper seedbed preparation and the use of quality seed are important in this practice. Failure to carefully follow sound agronomic recommendations will often result in an inadequate stand of vegetation that provides little or no erosion control. Seeding does not immediately stabilize soils. Maintain necessary erosion and sediment control practices, such as mulching, until vegetation is established.

Design Criteria

Successful vegetation establishment can be maximized with proper planning, consideration of soil characteristics, selection of seeds mixes that are suitable for the site, adequate seedbed preparation, fertilization, timely planting; and regular maintenance. Seed mixes will be selected based on National Resource Conservation Service (NRCS) seed mixes and be approved by landowners. Landowners may require specified seed mixes.

When to Seed

Areas to be stabilized with vegetation must be seeded or planted once grading is completed, unless temporary stabilization measures are in place. Temporary stabilization measures should be installed through “no growth” periods during winter months until the weather can support seed growth.

Seed Mix

Climate, soils, and topography are major factors that dictate the suitability of plants for a particular site. Vegetation that has adapted to the site, has strong roots, and provides good ground cover should be used. Seed mixes will be selected based on National Resource Conservation Service (NRCS) seed mixes and must be approved by landowners.

The attached Seed Mix table identifies the proposed seed mix for YY18-07 Pad. Final seed mix will be determined in consultation with the landowner and the land use at the time of reclamation.

Construction Specifications

Topsoil will not be preserved under the alternative reclamation plan for this location. Prior to permanent seeding application, Noble will ensure that areas to be revegetated have soil conditions capable of supporting vegetation. The rooting depth of most native grasses in the semi-arid Denver metropolitan area is 6 to 18 inches. Soils may also need to be amended to provide an appropriate plant-growth medium. Organic matter, such as well-digested compost, can be added to improve soil characteristics conducive to plant growth. Other treatments can be used to adjust soil PH conditions when needed. Soil testing may be completed to determine and optimize the types and amounts of amendments that are required. If the disturbed ground surface is compacted, the surface should be prepared by ripping the area to break up compaction. If adding compost to the existing soil, it can be mixed in after the ripping process.

- Add fertilizer and/or lime, if necessary. Lime and fertilizer may be incorporated into the top 2 to 4 inches of the soil if possible. The addition of lime is equally as important as applying fertilizer. Lime will modify the pH and supply calcium and magnesium. Its effect on pH makes other nutrients more available to the plant.

- The appropriate seed shall be evenly applied with a broadcast seeder, drill, cultipacker, or hydro-seeder. Seeding depth should be one-quarter to one-half inch.

Maintenance Considerations

The frequency of inspections should be in accordance with the SWMP. Vegetation is considered established when a uniform density of at least 70% of pre-disturbance background levels has been reached. Seeded areas should be inspected for failure and any necessary repairs and re-seeding should be made within the same season if possible.

Hydro-mulch (H)

Description

Fiber Matrix: Fiber Matrix Hydro-mulch includes a wide range of soil binders, including

Flexible Growth Medium (FGM) that provides temporary soil stabilization. Soil binders may be applied alone or as tackifiers in conjunction with mulching and seeding applications. The stabilizer is sprayed onto the surface of exposed soil to temporarily bind the soil in place and minimize erosion from runoff and wind. These materials are easily applied to the surface of the soil, can stabilize areas where vegetation cannot be established, and provide immediate protection. Soil binders are typically applied to disturbed areas requiring short-term temporary protection. Because soil binders can often be incorporated into the work, they may be a good choice for areas where grading activities will soon resume. Hydro-mulch can also be applied to stockpiles to prevent water and wind erosion.

Posi-Shell®: Posi-Shell® is a cover system that is more durable than a Fiber Matrix Hydro-mulch. Posi- shell creates a non-flexible, cohesive, hard surface comprised of a blend of clay binders, reinforcing fibers, and polymers. When mixed with water, this mix produces a spray-applied mortar forming a thin layer of durable stucco. This surface conforms and adheres to underlying topography and is more resistant to weather and precipitation and requires less re-application. For this reason, Posi-Shell is used in longer-term situations when standard Fiber Matrix Hydro-mulch is ineffective (i.e. steep slopes, sandy soils, etc.). Posi-shell is delivered through any spray application equipment like the Fiber Matrix Hydromulch.

Applicability

Use hydro-mulch alone in areas where other methods of stabilization are not effective because of environmental constraints or use them in combination with vegetative or perimeter practices to *enhance* control of erosion and sedimentation. Posi-Shell can be utilized to protect ditches, stabilize slopes, and cover stockpiles.

Limitations

- Soil binders are temporary in nature and may need reapplication.
- Soil binders require a minimum curing time until fully effective, as prescribed by the manufacturer, which may be 24 hours or longer. Soil binders may need reapplication after a storm event.
- Soil binders will generally experience spot failures during heavy rainfall events.
- Soil binders do not hold up to pedestrian or vehicular traffic across treated areas.
- Soil binders may not penetrate soil surfaces made up primarily of silt and clay, particularly when compacted.
- Some soil binders may not perform well with low relative humidity. Under rainy conditions, some agents may become slippery or leach out of the soil.
- Some soil binders may not cure if low temperatures occur within 24 hours of application.

Design Criteria

- Closely follow the manufacturer's recommended application procedures to prevent the products from pooling and creating impervious areas where stormwater cannot infiltrate.
- Suitability to situation: Consider where the soil binder will be applied, if it needs a high resistance to leaching or abrasion, and whether it needs to be compatible with existing vegetation.
- Determine the length of time soil stabilization will be needed, and if the soil binder will be placed in an area where it will degrade rapidly.
- In general, slope steepness is not a discriminating factor.
- Soil types and surface materials: Fines and moisture content are key properties of surface materials.
- Consider a soil binder's ability to penetrate, likelihood of leaching, and ability to form a surface crust on the surface materials.
- Frequency of application: The frequency of application can be affected by subgrade conditions, surface type, climate, and maintenance schedule.

Maintenance Considerations

Soil binders tend to break down due to natural weathering. Weathering rates depend on a variety of site-specific and product characteristics. Consult the manufacturer for recommended reapplication rates and reapply the selected soil binder as needed to maintain effectiveness. Inspect chemically stabilized areas regularly for signs of erosion, and if necessary, reapply the stabilizer. Soil binders can fail after heavy rainfall events and may require reapplication. In particular, soil binders will generally experience spot failures during heavy rainfall events. If runoff penetrates the soil at the top of a slope treated with a soil binder, it is likely that the runoff will undercut the stabilized soil layer and discharge at a point further down slope. Areas where erosion is evident should be repaired and soil binder or other stabilization reapplied, as needed. Care should be exercised to minimize the damage to protected areas while making repairs.

Removal

Hydro-mulch does not need be removed. This includes the Posi-Shell®, which can be tracked into slopes when intermediate protection is no longer needed.

Soil Roughening – All Types (SR)

Description

Soil roughening may be accomplished by ripping, furrowing, disking, or tracking the soil to create trenches and other variations in soil surface. Surface roughening is used as a temporary CM to reduce the speed of runoff, increase infiltration, traps sediment, and prepares the soil for seeding and planting by capturing moisture for seed. Soil roughening can be an effective CM for controlling wind erosion.

Applicability

Soil roughening can be applied in most areas and is most effective in areas that do not have steep slopes or in soils with a high concentration of clay that may prevent infiltration of stormwater. The surface roughening technique of ripping can be applied in most areas as either a primary or secondary control as part of a series of CMs. Ripping is best used in areas where sheet flow of stormwater occurs and when used in a series to produce a treatment train.

Limitations

Depending on the surface and/or soil makeup, some areas might not be suitable for all ripping techniques, for example rock formations.

- Soil roughening is not appropriate for rocky slopes.
- Soil roughening does not work well in sandy soils.
- Soil compaction might occur when roughening with tracked machinery.
- Furrows, trenches, and tracking variations can easily become inundated with wind-blown sediment during high wind events.
- Soil roughening has limited effectiveness during heavy rains.
- If roughening is washed away in a heavy storm, the surface will have to be re-roughened.

Design Criteria

Soil roughening should be used in conjunction with other CMs such as mulching, seeding, or tackifier applications and should be along the contour of slopes. Surface roughening should be completed by going against the natural contours to slow stormwater velocity. Depths of trenches and furrow may vary depending on soil type and the type of soil roughening equipment that is used. Soil roughening can be installed as a perimeter control and is often combined with other CMs such as diversion ditches. All underground utilities should be located prior to the installation of ripping or other roughening that penetrates the surface.

Construction Specifications

Soil roughening should be completed by going against the natural contours to slow stormwater velocity. Ripped depths may vary depending on soil type and the distance between contours may be modified.

Ripping should be installed at the outer perimeter of the construction area to avoid damage by vehicle traffic. All underground utilities should be located prior to installation of roughening that penetrates the surface.

- To slow erosion, roughening should be done as soon as possible after grading activities have ceased (temporary or permanently) in an area.

- Cut and fill slopes and soil stockpiles should be roughened whenever possible.
- Do not blade or scrape the final fill slope face after roughening.
- Excessive compacting of the soil surface should be avoided during roughening.
- When ripping, tool bar should have a minimum of three mounted rippers. Ripped depths should be at least 6 inches in depth and not to exceed 18 inches.

Maintenance Considerations

The frequency of inspections should be in accordance with the SWMP. Roughening might need to be repeated after storm events or episodes of high wind.

Straw Mulching (SM)

Description

Mulching consists of evenly applying straw, hay, shredded wood mulch, bark or compost to disturbed soils and securing the mulch by crimping. Mulching helps reduce erosion by protecting bare soil from rainfall impact, increasing infiltration, and reducing runoff. Although often applied in conjunction with temporary or permanent seeding, it can also be used for temporary stabilization of areas that cannot be reseeded due to seasonal constraints. Straw or hay mulch can be used to provide erosion control and promote germination for newly seeded areas. When installed correctly, the mulch is anchored in the ground, simulating a root system. This artificial root system provides wind and surface erosion control by stabilizing the soils. Germination is facilitated through moisture retention, from precipitation events or irrigation.

Applicability

Mulch can be used during seeding to help protect the seedbed and stabilize the soil. Mulch can also be used as a temporary cover on low to mild slopes to help temporarily stabilize disturbed areas where growing season constraints prevent effective reseeding. Disturbed areas should be properly mulched and or seeded, promptly after disturbance activities are complete or when activities are idle for a prolonged period on portions of the site not otherwise stabilized.

Limitations

Adequate soil preparation is needed to ensure proper and significant depth of crimping. If not installed correctly, mulch can be susceptible to wind or surface erosion. Mulch should not be installed during windy conditions.

Design Criteria

Application rates need to be adjusted according to slope, soil conditions, season, and other factors that may require longer term cover and protection. A variety of mulches can be used effectively at construction sites. Clean, weed-free and seed-free straw should be applied evenly at a rate of 2 tons per acre and must be tacked or crimped by a method suitable for the condition of the site. Prior to mulching, surface-roughen areas by ripping, rolling with a crimping or punching type roller, or by track walking. Track walking should

only be used where other methods are impractical because track walking with heavy equipment typically compacts the soil.

Construction Specifications

Straw mulch must be anchored on the surface. This can be accomplished mechanically by crimping. Anchoring with a crimping implement is preferred and is the recommended method for areas flatter than 3:1. Mechanical crimpers must be capable of tucking the long mulch fibers into the soil to an ideal depth of 3 inches without cutting mulch strands. An agricultural disk, while not an ideal substitute, may work if the disk blades are dull or blunted and set vertically.

Maintenance Considerations

After mulching, the bare ground surface should not be more than 10 percent exposed. Reapply mulch, as needed, to cover bare areas.

Wind Erosion Control (WEC)

Description

Wind erosion and dust control CMs help to keep soil particles from entering the air as a result of land disturbing construction activities. These CMs include a variety of practices generally focused on either graded disturbed areas or construction roadways. For graded areas, practices such as seeding and mulching, use of soil binders, site watering, or other practices that provide prompt surface cover should be used. Soil roughening methods can be effective CMs controlling wind erosion.

Applicability

Wind erosion controls CMs are suitable during the following construction activities:

- Construction vehicle traffic on unpaved roads;
- Drilling and blasting activities;
- Sediment tracking onto paved roads;
- Soils and debris storage piles;
- Batch drop from front-end loaders;
- Areas with un-stabilized soil; and
- Final grading/site stabilization.

Limitations

- Watering prevents dust only for a short period and should be applied daily (or more often) to be effective;
- Over watering may cause erosion;

- Oil or oil-treated sub grade should not be used for dust control because the oil may migrate into drainage ways and/or seep into the soil;

- Effectiveness depends on soil, temperature, humidity, and wind velocity;

- Chemically treated sub grades may make the soil water repellant, interfering with long-term infiltration and the vegetation/re-vegetation on the site. Some chemical dust suppressants may be subject to freezing and may contain solvents and should be handled properly;

- Asphalt, as a mulch tack or chemical mulch, requires a 24-hour curing time to avoid adherence to equipment, worker shoes, etc. Application should be limited because asphalt surfacing may eventually migrate into the drainage system;

- In compacted areas, watering and other liquid dust control CMs may wash sediment or other constituents into the drainage system.

Design Criteria

Many local agencies require dust control in order to comply with local laws, opacity laws (visibility impairment), and the requirements of the Clean Air Act. The following are measures that local agencies may have already implemented as requirements for dust control from contractors:

- Limit open area of disturbance when possible.

- Limit construction and grading activity during times where high winds are present.

- Apply water or synthetic stabilizers when necessary and alternative procedures do not provide desired results.

Construction Specifications

Dust control CMs generally stabilize exposed surfaces and minimize activities that suspend or track dust particles. For heavily traveled and disturbed areas, wet suppression (watering), chemical dust suppression, gravel asphalt surfacing, temporary gravel construction entrances, equipment wash-out areas, and haul truck covers can be employed as dust control applications. Permanent or temporary vegetation and mulching can be employed for areas of occasional or no construction traffic. Preventive measures would include minimizing surface areas to be disturbed, limiting on-site vehicle traffic to 15 miles per hour and controlling the number and activity of vehicles on a site at any given time. For chemical stabilization, there are many products available for chemically stabilizing gravel roadways and stockpiles. If chemical stabilization is used, the chemicals should not create any adverse effects on stormwater, plant life, or groundwater.

Maintenance Considerations

Inspect and verify that dust control practices and CMs are in place prior to the commencement of dust producing activities. Inspect routinely looking for excessive airborne dust from vehicle or construction activities. If noted, implement appropriate dust control CMs as needed. Check areas protected to ensure coverage. Most dust control CMs require frequent application and maintenance. Utilize practice-based controls such as

limiting disturbance and limiting activity during high winds whenever possible.

9. ***Site-Specific Topsoil Protection Best Management Practices (BMPs)***

YY18-07 Pad

Stockpiled soils shall be protected from degradation due to contamination, compaction, as well as wind and water erosion to the best extent practicable by implementing control measures (CM's) described in Operator's "Field-Wide Stormwater Control Measure (CM) Manual For Construction Activities". Utilizing these CM's, as described, shall also aid in the prevention of weed establishment, and help maintain soil microbial activity by promoting vegetative growth. CM's will be implemented based upon site design, level of risk for soil degradation, as well as the anticipated duration for a stockpile to remain in place.

The Following BMPs are anticipated to be used for protection of topsoil at this location:

- Noble will follow the requirements of the Alternative Reclamation Plan.
- There will be no soil stockpiles on this location. This will reduce the erosion potential of soils on-site and meet the preferences of the landowner. The Alternative Reclamation Plan has been included as part of a COGCC Rule 1002.b. variance request that is being submitted with the Form 2A.
- The location has been designed in a way that eliminates the need for stockpiled soils after construction cut/fill activities have been complete.
- Noble will monitor the site for the presence of noxious weeds. If encountered, Noble will employ a third-party consultant knowledgeable in identifying such species and implement weed control measures consistent and in compliance with the Colorado Noxious Weed Act. Management will be performed by either mowing or spraying and in some rare occasions, both methods may be necessary. Any spraying conducted will be coordinated with the landowner.
- Please refer to the site-specific Stormwater Management Plan for additional BMPs regarding erosion and sediment controls for the location.
- Please refer to the site-specific Interim Reclamation Plan for additional BMPs regarding seeding and revegetation for the location.

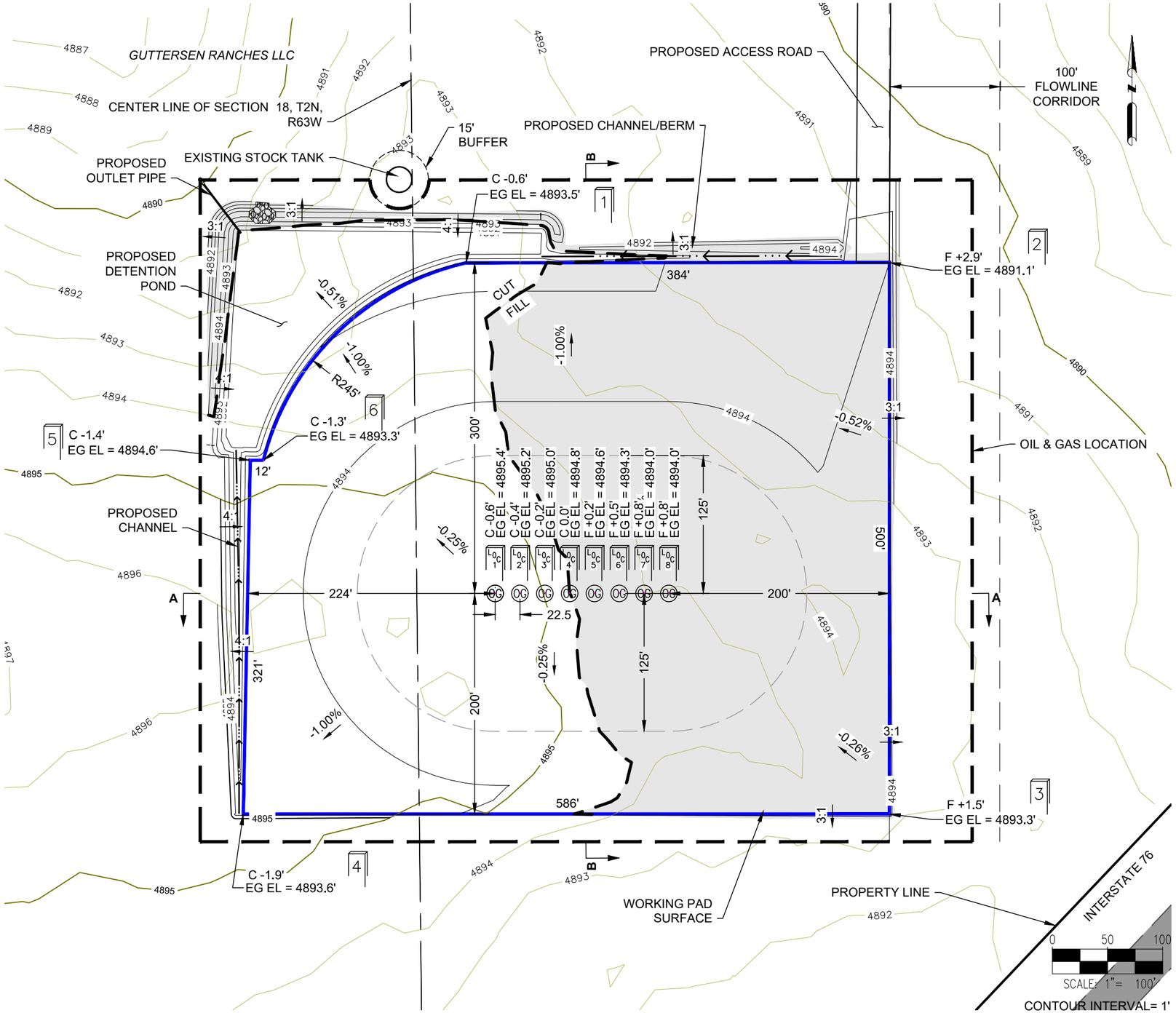
Exhibits/References/Appendices

Layout Drawings

NRCS Custom Soil Resource Report

Table S – Proposed Seed Mix

YY18-07 PAD
LAYOUT DRAWINGS



SITE QUANTITIES

FINISHED GRADE ELEVATION	4,893.7' -	4,896.0'
ROUGH GRADE ELEVATION	4,892.7' -	4,895.0'
TOTAL CUT FOR SITE	6,246	CY
TOTAL FILL FOR SITE	5,968	CY
NET EXCESS MATERIAL	278	CY
OIL & GAS LOCATION AREA	9.6	ACRES
WORKING PAD SURFACE AREA	6.4	ACRES
ACCESS ROAD DISTURBANCE AREA	5.4	ACRES
FLOWLINE CORRIDOR AREA	15.7	ACRES

LEGEND:

- EXISTING PROPERTY LINE
- 5280 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- 5280 PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED CHANNEL
- WORKING PAD SURFACE
- FLOWLINE CORRIDOR
- OIL & GAS LOCATION
- CENTER-SECTION LINE
- OG PROPOSED OIL & GAS WELL
- RIP RAP OR SLOPE PROTECTION
- GUTTERSEN YY18-740
- GUTTERSEN YY18-730
- GUTTERSEN YY18-720
- GUTTERSEN YY18-712
- GUTTERSEN YY18-05
- GUTTERSEN YY18-06
- GUTTERSEN YY18-07
- GUTTERSEN YY18-08

NOTES:

1. ASCENT GEOMATICS SOLUTIONS WAS NOT PROVIDED A TITLE REPORT FOR THIS SITE. ALL RECORDED DOCUMENTS REFERENCED ON THESE PLANS WERE DOWNLOADED FROM RESEARCH VIA THE WELD COUNTY CLERK AND RECORDER. ASCENT GEOMATICS SOLUTIONS MAKES NO GUARANTY OR WARRANTY, EITHER EXPRESSED OR IMPLIED, TO THE COMPLETENESS OF ENCUMBRANCES TO THE SUBJECT PROPERTY.
2. NO TOP SOIL WILL BE PRESERVED AT THIS LOCATION DUE TO THE LANDOWNER'S PREFERENCE.

DISCLAIMER:
THIS PLOT DOES NOT REPRESENT A MONUMENTED LAND SURVEY AND SHOULD NOT BE RELIED UPON TO DETERMINE BOUNDARY LINES, PROPERTY OWNERSHIP OR OTHER PROPERTY INTERESTS. PARCEL LINES, IF DEPICTED HAVE NOT BEEN FIELD VERIFIED AND MAY BE BASED UPON PUBLICLY AVAILABLE DATA THAT ALSO HAS NOT BEEN INDEPENDENTLY VERIFIED.

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

PREPARED FOR:

NOBLE ENERGY INC.
1625 BROADWAY , SUITE2200
DENVER, CO 80202
(303) 228-4000

SHEET NAME: CONSTRUCTION LAYOUT

SURFACE LOCATION: SW 1/4 NE 1/4 SECTION 18 T2N, R63W, 6TH P.M. WELD COUNTY, COLORADO

REV.	REVISION DESCRIPTION	BY	DATE
0	ISSUED FOR FINAL	DMM	4/25/23
1	ISSUED FOR FINAL	RMC	5/4/23

DRAWING DATE: 4/25/23

DRAFTED BY: DMM

SHEET NO. 1 OF 5

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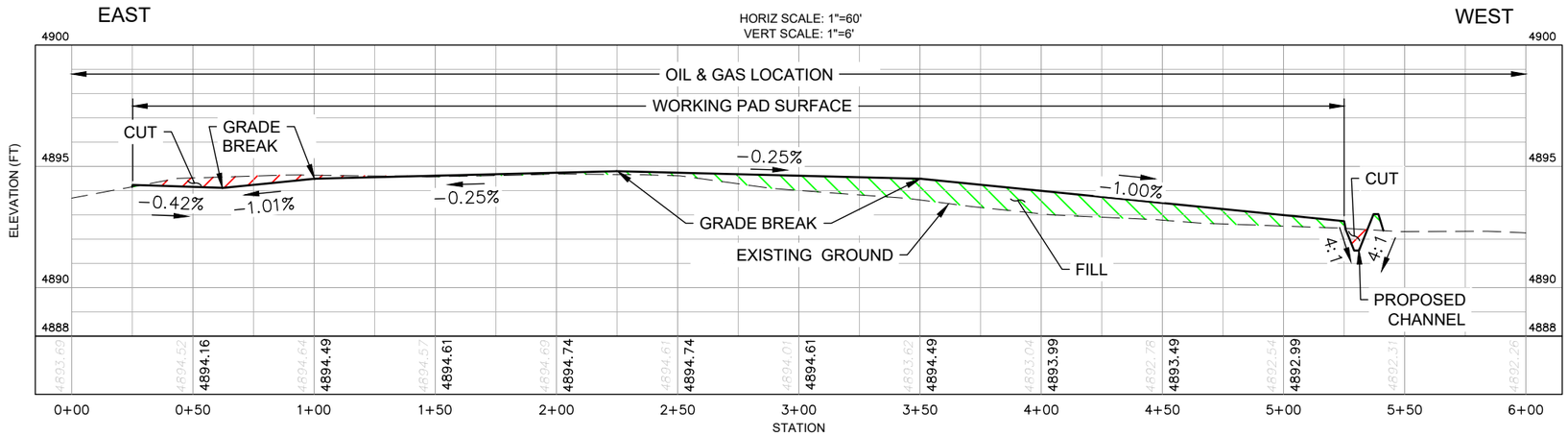
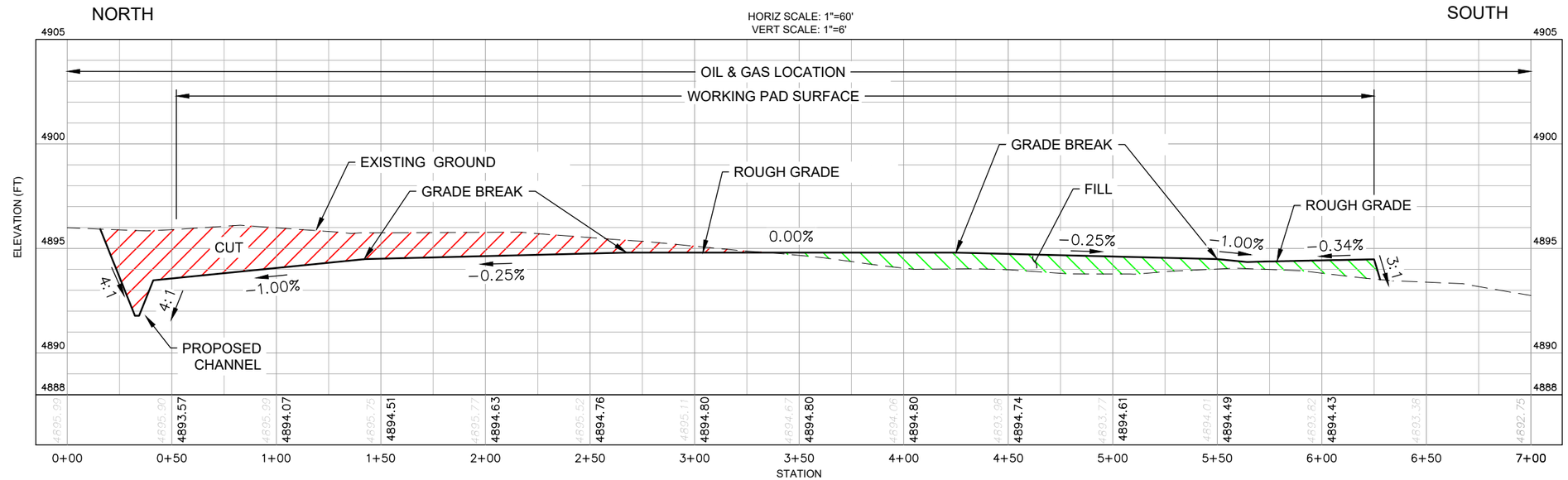
YY18-07 PAD
LAYOUT DRAWINGS



SECTION A - LOOKING SOUTH



SECTION B - LOOKING EAST

DISCLAIMER:
THIS PLOT DOES NOT REPRESENT A MONUMENTED LAND SURVEY AND SHOULD NOT BE RELIED UPON TO DETERMINE BOUNDARY LINES, PROPERTY OWNERSHIP OR OTHER PROPERTY INTERESTS. PARCEL LINES, IF DEPICTED HAVE NOT BEEN FIELD VERIFIED AND MAY BE BASED UPON PUBLICLY AVAILABLE DATA THAT ALSO HAS NOT BEEN INDEPENDENTLY VERIFIED.

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

PREPARED FOR:
Chevron
NOBLE ENERGY INC.
1625 BROADWAY , SUITE2200
DENVER, CO 80202
(303) 228-4000

SHEET NAME:
CROSS SECTIONS

SURFACE LOCATION
SW 1/4 NE 1/4 SECTION 18
T2N, R63W, 6TH P.M.
WELD COUNTY, COLORADO

REV.	REVISION DESCRIPTION	BY	DATE
0	ISSUED FOR FINAL	DMM	4/25/23

DRAWING DATE: 4/25/23
DRAFTED BY: DMM
SHEET NO. 2 OF 5

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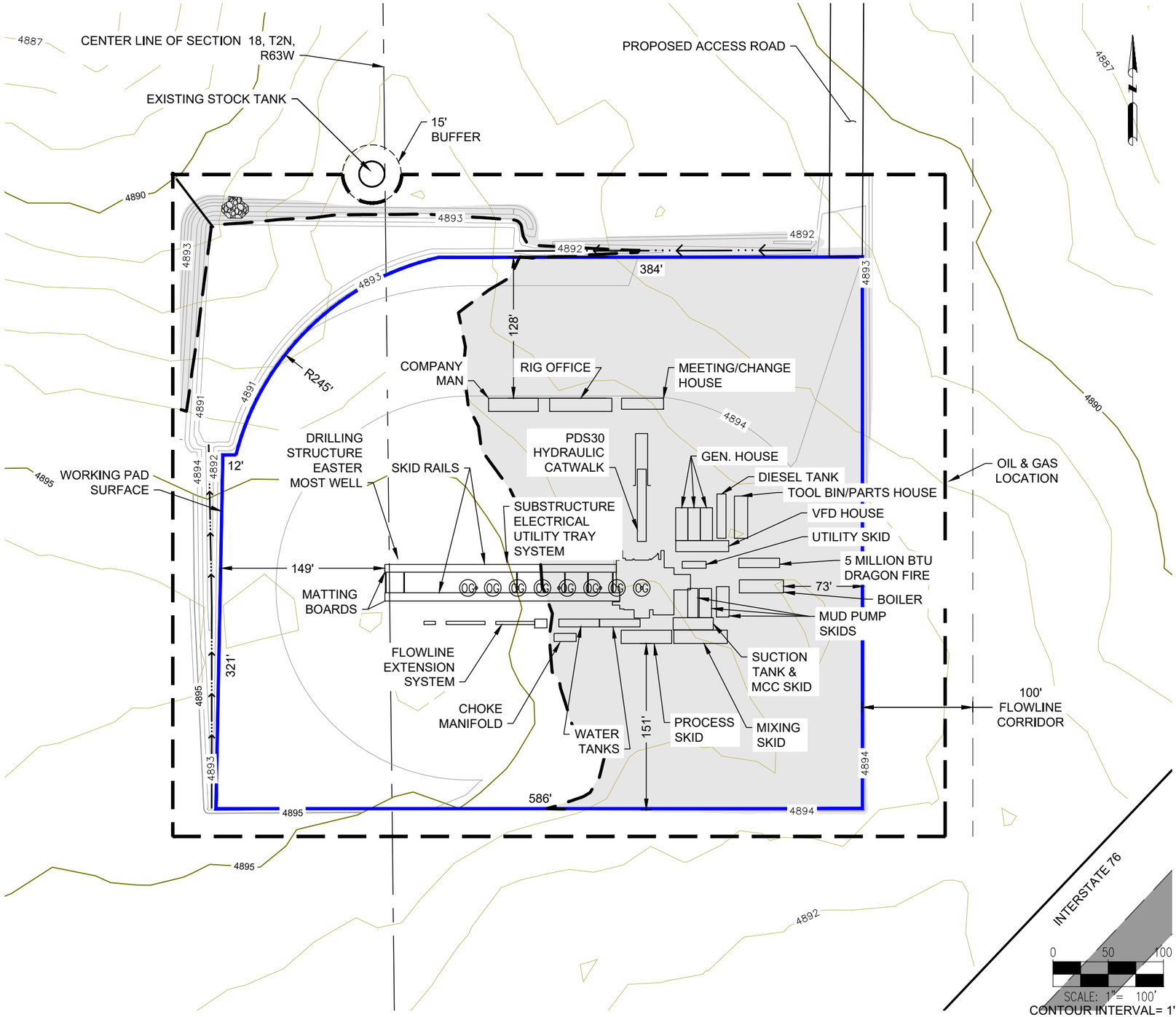
YY18-07 PAD
LAYOUT DRAWINGS



LEGEND:

- EXISTING PROPERTY LINE
- EXISTING MAJOR CONTOUR (5280)
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR (5280)
- PROPOSED MINOR CONTOUR
- PROPOSED CHANNEL
- WORKING PAD SURFACE
- FLOWLINE CORRIDOR
- OIL & GAS LOCATION
- CENTER-SECTION LINE
- PROPOSED OIL & GAS WELL (OG)
- RIP RAP OR SLOPE PROTECTION

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

PREPARED FOR:

NOBLE ENERGY INC.
1625 BROADWAY , SUITE2200
DENVER, CO 80202
(303) 228-4000

SHEET NAME: RIG LAYOUT

SURFACE LOCATION
SW 1/4 NE 1/4 SECTION 18
T2N, R63W, 6TH P.M.
WELD COUNTY, COLORADO

REV.	REVISION DESCRIPTION	BY	DATE
0	ISSUED FOR FINAL	DMM	4/25/23
		MA	4/25/23

DRAWING DATE: 4/25/23

DRAFTED BY: DMM

SHEET NO. 3 OF 5

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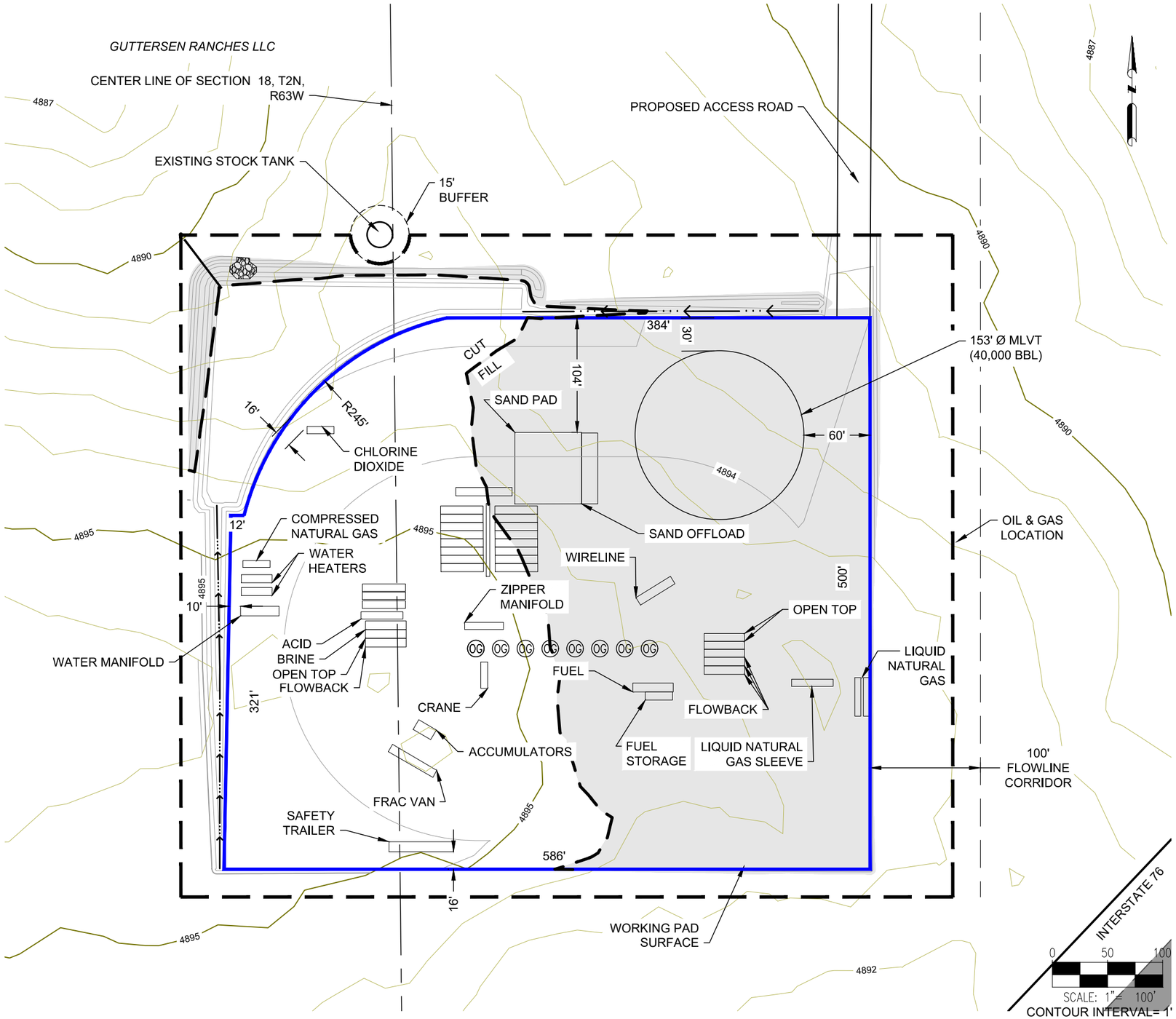
YY18-07 PAD
LAYOUT DRAWINGS



LEGEND:

- EXISTING PROPERTY LINE
- 5280 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- 5280 PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED CHANNEL
- WORKING PAD SURFACE
- FLOWLINE CORRIDOR
- OIL & GAS LOCATION
- CENTER-SECTION LINE
- OG PROPOSED OIL & GAS WELL
- RIP RAP OR SLOPE PROTECTION

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

PREPARED FOR:

Chevron

NOBLE ENERGY INC.
1625 BROADWAY , SUITE2200
DENVER, CO 80202
(303) 228-4000

SHEET NAME: COMPLETIONS & STIMULATION LAYOUT

SURFACE LOCATION
SW 1/4 NE 1/4 SECTION 18
T2N, R63W, 6TH P.M.
WELD COUNTY, COLORADO

REV.	REVISION DESCRIPTION	BY	DATE
0	ISSUED FOR FINAL	DMM	4/25/23

BY	DATE
MA	4/25/23

DRAWING DATE: 4/25/23
DRAFTED BY: DMM
SHEET NO. 4 OF 5

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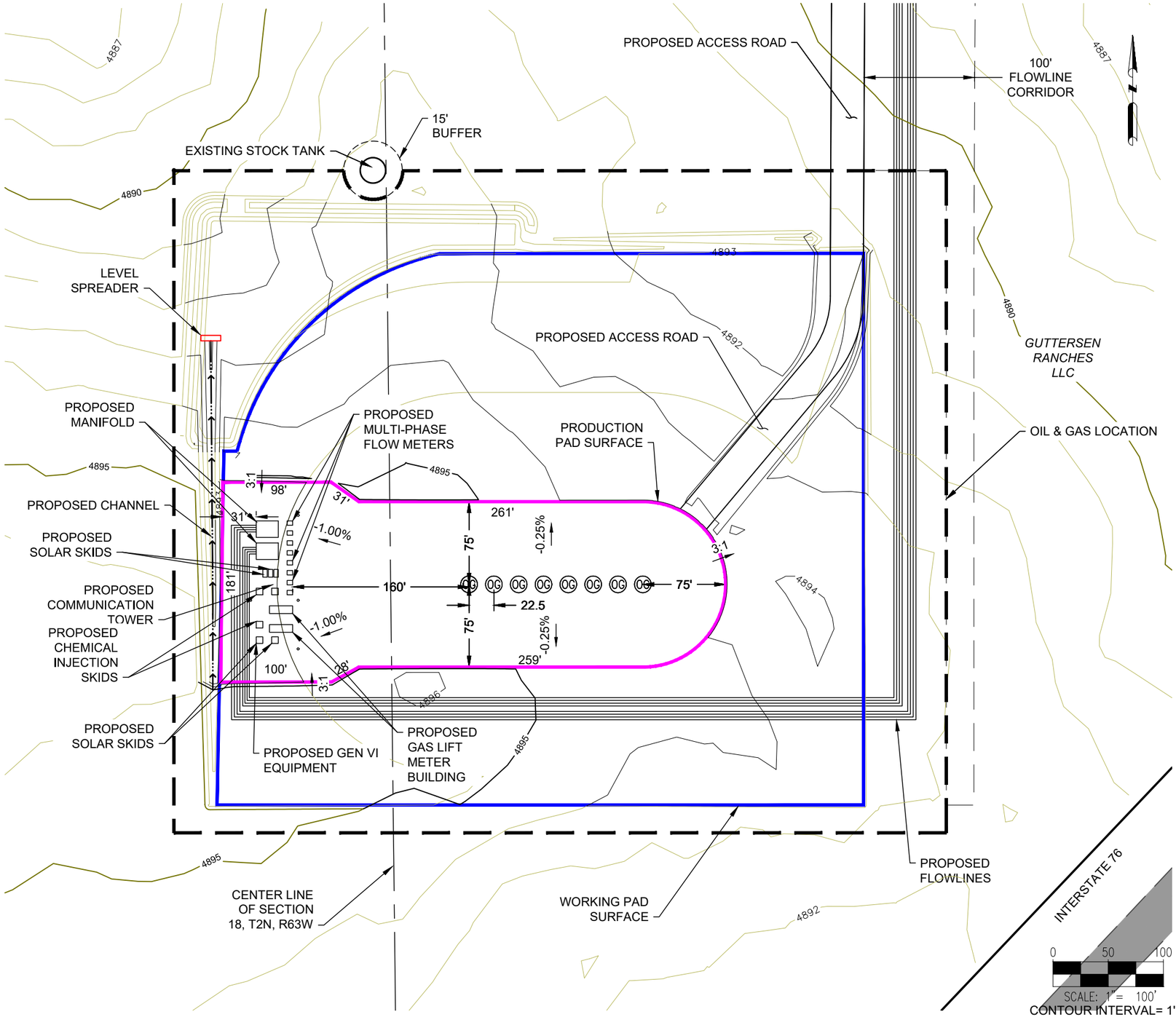
YY18-07 PAD
LAYOUT DRAWINGS



SITE QUANTITIES

TOTAL CUT FOR SITE	4,733	CY
TOTAL FILL FOR SITE	4,627	CY
NET EXCESS MATERIAL	106	CY
RECLAIMED AREA	7.3	ACRES
PERMANENT DISTURBANCE AREA	2.3	ACRES
OIL & GAS LOCATION AREA	9.6	ACRES
RECLAIMED ACCESS ROAD AREA	1.0	ACRES
PERMANENT ACCESS ROAD AREA	4.4	ACRES

LEGEND:

- EXISTING PROPERTY LINE
- 5280 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- 5280 PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED CHANNEL
- WORKING PAD SURFACE
- FLOWLINE CORRIDOR
- PRODUCTION PAD SURFACE
- OIL & GAS LOCATION
- CENTER-SECTION LINE
- OG PROPOSED OIL & GAS WELL
- RIP RAP OR SLOPE PROTECTION

SCALE: 1" = 100'
CONTOUR INTERVAL= 1'

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

PREPARED FOR:
Chevron
NOBLE ENERGY INC.
1625 BROADWAY , SUITE2200
DENVER, CO 80202
(303) 228-4000

SHEET NAME: FACILITY LAYOUT

SURFACE LOCATION
SW 1/4 NE 1/4 SECTION 18
T2N, R63W, 6TH P.M.
WELD COUNTY, COLORADO

REV.	REVISION DESCRIPTION	BY	DATE
0	ISSUED FOR FINAL	DMM	4/25/23
		MA	4/25/23

DRAWING DATE: 4/25/23
DRAFTED BY: DMM
SHEET NO. 5 OF 5

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Custom Soil Resource Report
DP455 YY18-07 Pad
Soil Map

Map Scale: 1:1,530 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 20 40 80 120

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
45	Olney loamy sand, 3 to 5 percent slopes	9.6	100.0%
Totals for Area of Interest		**9.6**	**100.0%**

Map Unit Descriptions

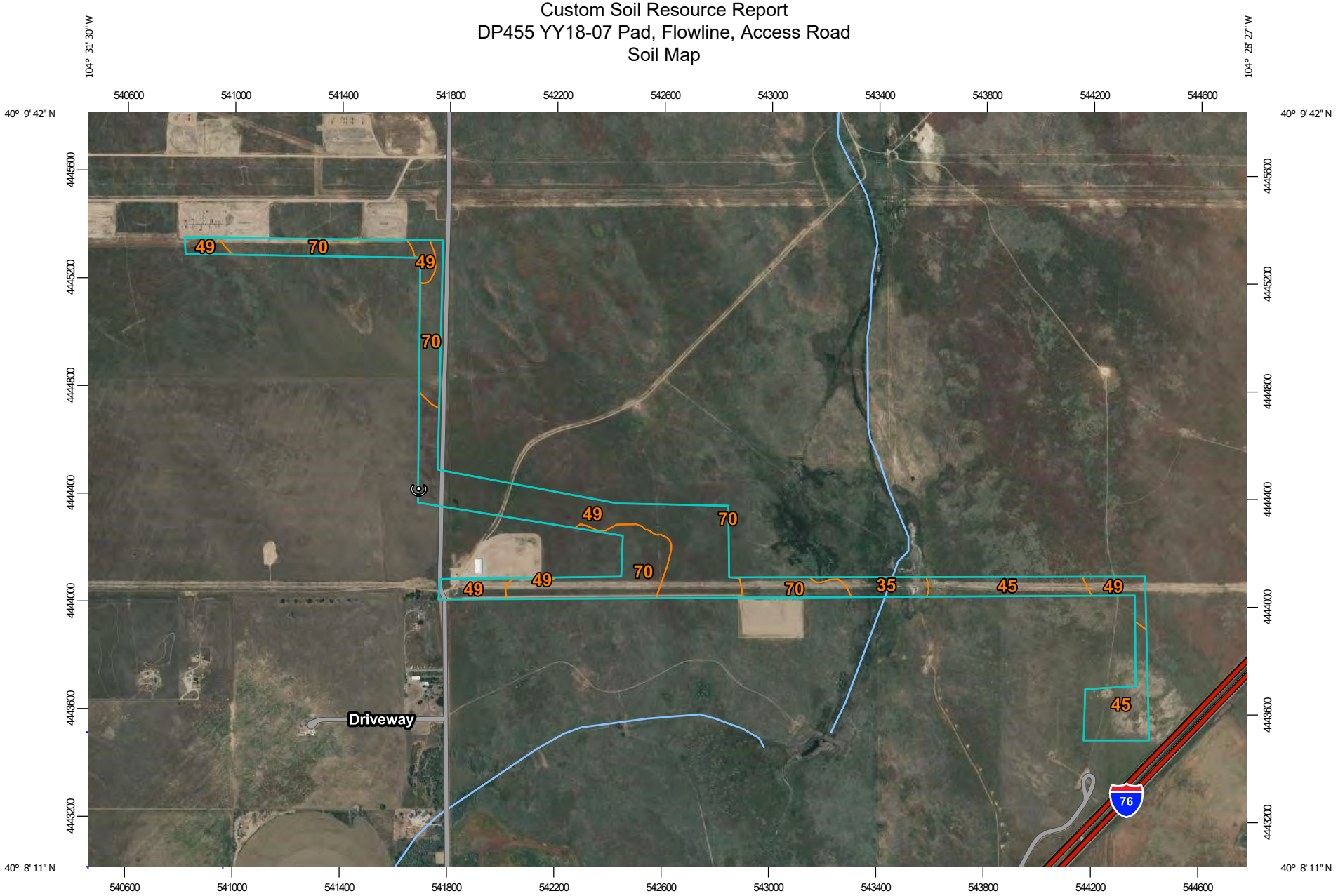
The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Custom Soil Resource Report
DP455 YY18-07 Pad, Flowline, Access Road
Soil Map



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Weld County, Colorado, Southern Part
Survey Area Data: Version 21, Sep 1, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 8, 2021—Jun 12, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
35	Loup-Boel loamy sands, 0 to 3 percent slopes	5.9	4.1%
45	Olney loamy sand, 3 to 5 percent slopes	24.6	17.0%
49	Osgood sand, 0 to 3 percent slopes	67.1	46.3%
70	Valent sand, 3 to 9 percent slopes	47.1	32.5%
Totals for Area of Interest		**144.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Weld County, Colorado, Southern Part

35—Loup-Boel loamy sands, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 362f
Elevation: 4,550 to 4,750 feet
Mean annual precipitation: 11 to 15 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Loup and similar soils: 55 percent
Boel and similar soils: 35 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Loup

Setting

Landform: Streams, drainageways, swales
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium

Typical profile

H1 - 0 to 16 inches: loamy sand
H2 - 16 to 40 inches: loamy sand
H3 - 40 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): 4w
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: A/D
Ecological site: R067BY029CO - Sandy Meadow
Hydric soil rating: Yes

Description of Boel

Setting

Landform: Drainageways, swales, streams
Down-slope shape: Linear

Across-slope shape: Linear
Parent material: Stratified sandy alluvium

Typical profile
H1 - 0 to 14 inches: loamy sand
H2 - 14 to 60 inches: loamy sand

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups
Land capability classification (irrigated): 4w
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: A
Ecological site: R067BY029CO - Sandy Meadow
Hydric soil rating: No

Minor Components

Osgood
Percent of map unit: 5 percent
Hydric soil rating: No

Valent
Percent of map unit: 5 percent
Hydric soil rating: No

45—Olney loamy sand, 3 to 5 percent slopes

Map Unit Setting
National map unit symbol: 362s
Elevation: 4,600 to 5,200 feet
Mean annual precipitation: 11 to 15 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 125 to 175 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Olney and similar soils: 85 percent
Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Olney

Setting

Landform: Plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed deposit outwash

Typical profile

H1 - 0 to 10 inches: loamy sand
H2 - 10 to 20 inches: sandy clay loam
H3 - 20 to 25 inches: sandy clay loam
H4 - 25 to 60 inches: fine sandy loam

Properties and qualities

Slope: 3 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: R067BY024CO - Sandy Plains
Hydric soil rating: No

Minor Components

Zigweid

Percent of map unit: 8 percent
Hydric soil rating: No

Vona

Percent of map unit: 7 percent
Hydric soil rating: No

49—Osgood sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 362x
Elevation: 4,680 to 4,900 feet

Mean annual precipitation: 13 to 15 inches
Mean annual air temperature: 46 to 55 degrees F
Frost-free period: 140 to 150 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Osgood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Osgood

Setting

Landform: Plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian sands

Typical profile

H1 - 0 to 22 inches: sand
H2 - 22 to 34 inches: sandy loam
H3 - 34 to 60 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R067BY015CO - Deep Sand
Hydric soil rating: No

Minor Components

Valent

Percent of map unit: 10 percent
Hydric soil rating: No

Dailey

Percent of map unit: 5 percent
Hydric soil rating: No

70—Valent sand, 3 to 9 percent slopes

Map Unit Setting

National map unit symbol: 2tczf
Elevation: 3,050 to 5,150 feet
Mean annual precipitation: 12 to 18 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Valent and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Valent

Setting

Landform: Hills, dunes
Landform position (two-dimensional): Shoulder, backslope, footslope, summit
Landform position (three-dimensional): Head slope, nose slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Noncalcareous eolian sands

Typical profile

A - 0 to 5 inches: sand
AC - 5 to 12 inches: sand
C1 - 12 to 30 inches: sand
C2 - 30 to 80 inches: sand

Properties and qualities

Slope: 3 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 39.96 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R067BY015CO - Deep Sand, R072XY109KS - Rolling Sands

Hydric soil rating: No

Minor Components

Dailey

Percent of map unit: 10 percent
Landform: Interdunes
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R067BY015CO - Deep Sand, R072XA021KS - Sands (North) (PE 16-20)
Hydric soil rating: No

Vona

Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Shoulder, backslope, footslope
Landform position (three-dimensional): Head slope, nose slope, side slope, base slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R067BY024CO - Sandy Plains, R072XA022KS - Sandy (North) Draft (April 2010) (PE 16-20)
Hydric soil rating: No

Haxtun

Percent of map unit: 5 percent
Landform: Interdunes
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R067BY024CO - Sandy Plains, R072XY111KS - Sandy Plains
Hydric soil rating: No

References

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Seed Mix

Table S - Proposed Seed Mix

									Specifications / Recommendations			
No.	Common Name	Scientific Nomenclature	Range	Sandy	Guttersen Mix	Local Reveg Success	Ecological Sites		PLS / lb.	Recommd. PLS lbs/ac	PLS / ft^2	% of Seeds in Mix
Grass	Indian Ricegrass	*Achnatherum hymenoides*	X	XXX	X	X			141,000	1.50	4.9	3.7%
	Blue Grama	*Bouteloua gracilis*	X	XXX	X	XXX	X		724,000	2.00	33.2	25.6%
	Sideoats Grama	*Bouteloua curtipendula*	X		X	X			191,000	1.00	4.4	3.4%
	Prairie sandreed	*Calamovilfa longifolia*	X	XXX		XXX	X		273,000	1.50	9.4	7.2%
	Switchgrass	*Panicum virgatum*	X	X	X	XXX	X		389,000	1.00	8.9	6.9%
	Sand Bluestem	*Andropogon hallii*	X	XXX	X	XXX	X		113,000	3.00	7.8	6.0%
	Big Bluestem	*Andropogon gerardii*	X	XXX	X				130,000		0.0	0.0%
	Little Bluestem	*Schizachyrium scoparium*	X	X	X	X			260,000	1.00	6.0	4.6%
	Yellow Indiangrass	*Sorghastrum nutans*	X	X	X				170,000		0.0	0.0%
	Western Wheatgrass	*Pascopyrum smithii*	X	X	X	XXX	X		110,000	3.00	7.6	5.8%
	Green Needlegrass	*Nassella viridula*	X		X	X			181,000	1.00	4.2	3.2%
	Sand Dropseed	*Sporobolus cryptandrus*	X	XXX	X	X			5,298,000	0.10	12.2	9.4%
	Thickspike Wheatgrass	*Elymus lanceolatus*	X	X	X				154,000		0.0	0.0%
							Grass Subtotal				**98.5**	**75.8%**
Forb	Blanket Flower	*Gaillardia aristata*	X		X				132,000	0.50	1.5	1.2%
	Annual Sunflower	*Helianthus annuus*	X	X	X	XXX			58,000	2.00	2.7	2.1%
	Purple Prairie Clover	*Dalea purpurea*	X	X	X				210,000	1.00	4.8	3.7%
	Rocky Mountain Beeplant	*Cleome serrulata*	X		X				65,900	2.00	3.0	2.3%
	Black Eyed Susan	*Rudbeckia hirta*	X		X				1,710,000	0.20	7.9	6.0%
							Forb Subtotal				**19.9**	**15.3%**
Shrub	Fourwing Saltbush	*Atriplex canescens*	X	XXX	X		X		50,000	2.00	2.3	1.8%
	Sand Sage	*Artemisia filifolia*	X	XXX		X			2,000,000	0.20	9.2	7.1%
							Shrub Subtotal			**2.20**	**11.5**	**8.8%**
		Total								**23.00**	**129.8**	